EFFECT OF CREDIT INFORMATION SHARING ON NON-PERFORMING LOANS OF MICROFINANCE BANKS IN KENYA

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DECLARATION

This research project is my original work and has not been submitted for a degree at any other university for examination.

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DEDICATION

I dedicate this research project to my Late Dad, Samuel Nyambuti for creating in me the Desire to excel academically since Childhood, My mother Kerubo for her Moral Support, my family for their unconditional Love and encouragement and my Mentor Mr. Sam Omukoko for his incredible advice, encouragement and Support.

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ABBREVIATIONS

CB   -   Credit Bureau

CIS   -   Credit Information Sharing

CRB   -   Credit Reference Bureau

DTMs   -   Deposit Taking Microfinance

FSD   -   Financial Sector Deepening

KWFT   -   Kenya Women Finance Trust

MFBs   -   Microfinance Banks

MFI   -   Microfinance Institutions

MFIs   -   Microfinance Institutions

NPL   -   Non-Performing Loans

SMEP   -   Small and Medium Enterprises Programme

ABSTRACT

Information sharing in the credit market is a relatively new concept in most developing or emerging markets. In various developing countries, credit information systems are still in their infancy, and information sharing among banks remains weak. Credit reference bureaus were introduced in the Kenyan banking sector to facilitate the concept of credit information sharing and to mitigate information asymmetry and credit risk. This study seeks to determine the effect of credit information sharing on non-performing loans of micro-finance banks in Kenya. The independent variable for the study is credit information sharing whereas the dependent variable is non-performing loans and the control variables includes interest rates, inflation and economic growth. This study employed a descriptive research design. The population of this study entailed all the 11 microfinance banks registered by the Central Bank of Kenya. This study used secondary data analyzed using descriptive and inferential statistics. The study found that credit information sharing had a significant negative relationship with non-performing loans whereas. The study concluded that there is an inverse significant relationship between credit information sharing and the level of nonperforming loans and that an increase in interest rates increases the level of nonperforming loans while low economic growth also adversely affects the level of nonperforming loans. The study also concluded that there is a direct relationship between inflation and the level of nonperforming loans of microfinance banks in Kenya. The study recommended that leadership of microfinance banks should enhance the sharing of credit information to ensure that they reduce the levels of nonperforming loans in their banks.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Credit information sharing (CIS) has proved a critical aspect of financial infrastructure that aids financiers to improve risk assessment and consumers acquire credit at competitive terms (FSD Kenya, 2011). In many countries, banks and MFI's routinely share information on the creditworthiness of their borrowers. It occurs either on a voluntary basis through credit bureaus, set up by the lenders or functioned independently by a third party, or on a mandatory basis, through public credit registers (Jappelli & Pagano, 2005). According to Jappelli and Pagano (2002), information sharing among lenders attenuates adverse selection and moral hazard, and therefore increases lending and reduces default rates. Thus, nowadays loan approvals no longer take days or weeks but are made in minutes, thanks to information derived from credit reports (Brown & Zehnder, 2007).

Theoretical and empirical analyses show that banks' sharing of information on borrowers helps to curtail the effects of adverse selection and moral hazard, reduces credit risk, makes for readier access to the credit market (Artigas, 2004). Moral hazard occurs ex-post to project outcome if a borrower only reneges on a promise to repay (McIntosh & Wydick, 2007). Information asymmetries occur when gaining information on the characteristics or behavior of the borrower while adverse selection occurs when one party has better information than other parties do about some parameters that are relevant for the relationship (Curak, Pepur & Poposki, 2013). Thus, CIS solves the moral hazard and adverse selection problems through credit reference bureaus, which act as brokers of information through the collection, filing

and distributing the information voluntarily supplied by their members (Maina et al., 2016).

Microfinance is the facilitation of financial services to low-income individuals who lack access to the conventional banking sector. Microfinance banks also advance loans to their clients hence they play a vital role towards the development of economy (Jayadev & Rao, 2012). Microfinance Banks have a crucial role of providing different financial products and services to the people most especially the low-income earners who lack collateral to borrow from formal financial institutions. However, the Microfinance sector is also faced with challenges of loan repayment defaults by clients and loan delinquency has continued to pose serious problems to most Microfinance Banks (Idama, Asongo & Nyor, 2014). Therefore, MFIs are increasingly utilizing the services of credit bureaus to address a fundamental exertion of all credit markets, asymmetric information between debtor and creditor that can lead to problems of adverse selection and moral hazard (Luoto, McIntosh & Wydick, 2007).

1.1.1 Credit Information Sharing

Credit information sharing (CIS) is the procedure where financiers submit information about their borrowers to a credit reference bureau so that other credit providers can share (Jappelli & Pagano, 2005). Credit information schemes disseminate knowledge of payment history, total debt exposure, and overall creditworthiness, thus bridging the information divide between lenders and borrowers (Peria & Singh, 2014). Credit information sharing enables banks to get access to a credit report generated by the Credit Reference Bureau (CRB). It contains details on a borrower's credit history, debtor's identity, bankruptcy, credit facilities and late settlement of previous loans

and latest checks made by other prospective lenders (Wasseja, Oseso & Ochieng, 2016).

Credit information sharing schemes help financiers and borrowers overcome asymmetric information problems because the systems allow funders to share with other financier's information about their clients, either through a privately held credit bureau (CB) or publicly regulated credit registry (Peria & Singh, 2014). Information sharing about customers is an important specific feature of the banking industry since MFI's can access information for both their institution clients and those of other banks. Moreover, information sharing allows creditors make a proper assessment of potential customer risk profile and introduce incentives to have a borrower settle on time in the form limiting a borrower's future ability to access credit from other credit suppliers (Turner & Varghese, 2010).

Information sharing is particularly relevant for credit market performance in countries with weak company law and creditor rights (Brown, et al., 2007). CIS enables banks to distinguish between bad and good borrowers. Therefore, defaulters will not be able to walk into a bank and get credit. Lenders who provide their personal information to credit bureaus are given access to the common database insofar as the information presented timely and accurate (Jappelli & Pagano, 2005). Credit bureaus often generate credit reports, which help lenders to decide whether to extend an applicant's loan, credit card overdraft facility or extend any other product, which is reliant on customer's ability to repay at a determined cost (Riungu, 2014). The number of reports generated by credit bureaus and requested by lenders and clients is frequently used to proxy the level of credit information sharing.

1.1.2 Non-Performing Loans

A loan is nonperforming when payment of interest and principal are past due for over 90 days or more and are other valid reasons to doubt that payments will be made in full. It is an overdue loan whose recovery is highly doubtful because loans are not being serviced as expected (Boudriga, Boulila & Jellouli, 2009). Non-performing loans are viewed as problematic loans, which are characterized with delayed payments of principal and/or interests (Warue, 2013). A problem loan can also be said to be a loan that is no longer yielding principal and interest payments, making it an enigma for a financial institution in the sense that it is no longer collecting money on the loan (Omitogun, Olanrewaju & Alalade, 2016). Aduda and Gitonga (2011) define NPLs as those loans that are not being serviced as per loan contracts and exhibit the financial institutions to potential losses.

The existence of high levels of non-performing loans (NPLs) in the banking industry negatively influences the level of private investment, impair MFI's ability to pay its liabilities when they fall due and constrain the extent of bank credit to borrowers (Warue, 2013). Therefore, a significant threat to the banking sector is a prevalence of non-performing loans since non-performing loans cause a vicious effect on banking survival and growth, and if not managed properly leads to banking failures (Mwengei, 2013). A rise in NPLs' rate are the main reason for a decline in earnings of banks since nonperforming loans lead to mismatches of maturities between assets and liabilities; they lower profitability and enhance liquidity problems so their continuous increase may bring banks to insolvency (Turan & Koskija, 2014).

NPL represents bad loans, the borrowers of which failed to satisfy their repayment obligations (Mwengei, 2013). A rise in NPLs is an alarming sign for any country's' banking sector but an increase in profitability can help in placing them out of sight. The rapid growth in NPLs poses challenges on the flexibility of banking sector to increase their provisions for NPLs (Ahmad, 2013). Moreover, the increase in nonperforming loans reveals that individuals and businesses have challenges in making their payments and this raises the risk of the entire economic system of the country (Turan & Koskija, 2014). The increase in NPL's rate is often associated with the failure of credit policy too. Thus, the non-performing loan is measured using the loan loss ratio which is a proxy constituting charge-offs plus NPLs divided by total loans (Saba, Kouser, and Azeem, 2012).

1.1.3 Credit Information Sharing and Non-Performing Loans

Information sharing creates incentives for borrowers to perform in line with banks' interests and that information sharing can drive borrowers to repay loans when the legal environment makes it difficult for banks to enforce credit contracts (Brown, Jappelli & Pagano, 2007). As such, by exchanging information about their customers, banks can improve their knowledge of applicants' characteristics, past behavior and current debt exposure. Thus, information sharing reduces informational asymmetries, which in turn reduces adverse selection obstacles in lending, as well as change borrowers' motives to repay, both directly and by adjusting the competitiveness of the credit market (Brown, Jappelli & Pagano, 2007). Gietzen (2016) also posits that information sharing efficiently mitigates adverse selection problems since information sharing facilitates tracing borrowers who switch banks.

A study by Karapetyan and Stacescu (2010) on information sharing and information acquisition in credit markets, established that information sharing provide more accurate lending decisions, provide higher welfare, which leads to an increased locus on relationship banking, and favor informationally opaque borrowers. According to McIntosh and Wydick (2004), credit information systems first create a screening effect that advances risk evaluation of loan applicants, thereby raising portfolio quality, which, in turn, reduces rates of arrears. Jappelli and Pagano (2002) in their study on information sharing, lending and defaults revealed that bank lending has gone up and credit risk lowered in countries where lenders share information, regardless of the private or public quality of the information sharing mechanism.

A study by Ocharo (2013) on the effect of credit information sharing on the non-performing loans among Kenyan commercial banks established that there is a negative effect on credit information sharing and non-performing loans and that the level of non-performing loans tends to reduce with increase in credit information sharing. Kamau, Namiinda and Buluma (2016) also analyzed how systems integrity in credit information sharing practices affects the administration of credit risk in commercial banks and revealed that the system integrity in credit information sharing significantly affected the management of credit risk hence nonperforming loans. Additionally, Kisengese (2014) also assessed the impact of the credit reference bureaus on non-performing loans of commercial banks in Kenya and revealed that sharing of credit information influences the level of non-performing loans as it helped the banks to decline lending to chronic defaulters.

1.1.4 Microfinance Banks in Kenya

Microfinance banks or Deposit Taking Microfinance Institutions (DTMs) are financial institutions that accept demand deposits and use the deposits as a means to generate capital for the extension of credit to customers. MFBs are registered under the Microfinance Act (2008) but are not fully registered banks but are subject to many of the same conditions under the prudential control of the Central Bank, given that they use customer deposits to raise capital for independent loans (Alastair, 2015). By the end of 2015, there were twelve registered Microfinance banks (MFBs) in Kenya registered and supervised by CBK and they include Faulu MFB, KWFT, Caritas MFB, Century MFB, Choice MFB, Daraja MFB, REMU MFB, SMEP MFB, Rafiki MFB, Sumac MFB U&I MFB and Uwezo MFB Ltd (CBK, 2015).

Credit information sharing (CIS) mechanism was officially launched in July 2010 and with impact from 31st July 2010, all institutions licensed under the Banking Act began participating in negative data sharing (FSD Kenya, 2011). The draft CRB Regulations (2012) allowed sharing of positive credit information by deposit-taking microfinance institutions licensed by the CBK but such information could only be shared if the DTMs obtained prior written consent from their borrowing customers (FSD Kenya, 2013). However, improvements on the Credit Reference Bureau Regulations (2013) allowed Microfinance Institutions (MFIs) to administer credit information on a credit facility that is not generating revenue and the principal or interest is due and unpaid for, more than ninety days and includes a loan or credit facility categorized as either substandard, doubtful or loss without written consent from customers.

Microfinance banks face default risk and which leads to non-performing loans hence the need to share their credit information like the other financial institutions. According to Idama, Asongo and Nyor (2014) credit risk continues to be a threat to Microfinance banks sustainability and a significant challenge facing microfinance banks is the battle to control its portfolio at risk to remain within the international benchmark. Moreover, Munee (2013) concluded that sharing of credit information had led to a decrease in the non-performing loans, which has an impact on the financial performance of banks. Further, Riungu (2014) concluded that credit reference bureau services serve in reducing the extent of non-performing loans and hence in growing the bank profitability.

1.2 Research Problem

Information sharing in the credit market is a relatively new concept in most developing or emerging markets (Kusi & Ansah-Adu, 2015). In various developing countries, credit information systems are still in their infancy, and information sharing among banks remains weak (Luoto, McIntosh & Wydick, 2007). Moreover, asymmetrically distributed information and problems of adverse selection are inherent to bank lending because borrowers usually know more about their undertakings than banks do (Gietzen, 2016). Some bad borrowers, knowing that banks operate in silos take advantage of information asymmetry to create multiple bad debts in the industry (Wasseja, Oseso & Ochieng, 2016). Moreover, NPLs are still a major concern for both international and local regulators as they exhibit vast disparities in a cross-country basis, particularly between developed and developing countries (Boudriga, Taktak & Jellouli, 2009).

Credit reference bureaus were introduced in the Kenyan banking sector to facilitate the concept of credit information sharing and to mitigate information asymmetry and credit risk (Mugwe & Olweny, 2015). However, in Kenya, all commercial banks gross non-performing loans rose by 14.1 percent in year 2013 to Ksh 61.6 billion in December 2014. Further, the ratio of total non-performing loans to gross loans rose from 4.5 percent in December 2013 to 5.0 percent in December 2014 (Toroitich & Omwono, 2015). As such, the banking sector in Kenya continues to face difficulties of managing bad debts and ensuring that debtors did not only move between banks was of prime concern (FSD Kenya, 2014). Hence, the need to explore the effect of credit information sharing on non-performing loans of microfinance banks in Kenya

Several studies have also been undertaken on credit information sharing. For example, Peria and Singh (2014) analyzed the impact of introducing credit information sharing systems on firms' access to finance and found that credit bureau reforms have had a greater impact on firms' access to finance in countries where contract execution is weaker but the study did not focus on nonperforming loans. Grajzl and Laptieva (2011) also studied the impact of information sharing on the volume of private credit in Ukraine and found that information sharing through private credit bureaus is associated with an increase in the volume of bank lending but the study focused on lending and not on NPLs.

A study by Wasseja, Oseso and Ochieng (2016) in Kenya explored the relationship between credit information sharing and non-performing loans in the Kenyan banking sector and concluded that there is an inverse relationship between the number of credit analyses done by the credit bureaus and the level of non-performing loans. Owino (2013) also investigated lending policies and their impact on the levels of NPLs among commercial banks in Kenya and revealed that lending policies and non-

performing loans are closely related. However, both studies explored credit information sharing and NPLs in commercial banks. As such, despite, the numerous benefits reported to be associated with information sharing in the credit market very little studies have examined the effect of credit information sharing on non-performing in microfinance banks. Such has created a literature gap, which necessitates a study on what is the effect of credit information sharing on non-performing loans of micro-finance banks in Kenya?

1.3 Research Objective

To determine the effect of credit information sharing on non-performing loans of micro-finance banks in Kenya

1.4 Value of the Study

The study findings will be of value to managers of microfinance banks and other banking institutions as it may help them to develop managerial policies on credit information sharing and non-performing loans. The findings will also be of help to CRBs who may use its findings to improve credit sharing in Kenya. Further, the findings of the study will be of value to policy makers like the Central bank of Kenya to develop effective policies on credit sharing and ways to mitigate non-performing loans in Kenya. Finally, the study will be useful to other researchers who are interested on credit information sharing and non-performing loans in microfinance banks.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews published and unpublished studies such as journals, papers, books and other accredited researchers on the same topic under considerations. This chapter reviews the theoretical literature review, the determinants of nonperforming loans, empirical literature review and finally a summary of literature review.

2.2 Theoretical Literature Review

This section summarizes the theory of information asymmetric information, the adverse selection theory and the moral hazard theory to explain credit information sharing and non-performing loans.

2.2.1 Theory of Asymmetric Information

The theory of asymmetric information originated from the seminal work of Akerlof (1970), Rothschild, and Stiglitz (1976). The finding of Akerlof (1970) is referred to as the 'lemons problem' as it resembles the problem that created by lemons in the used-car market. The problem of asymmetric information occurs when one party of an economic transaction has insufficient knowledge about the other party to make accurate decisions (Tumay, 2009). According to Akerlof (1970) when only the average quality of the goods can be assumed in markets with a commodity of uncertain quality, over time goods of above-average quality will be driven out and will threaten the practicability of its market. In the case of consumer credit markets, the riskiness of a borrower can be thought of as the good that the lender purchases (Turner & Varghese, 2010).

Information asymmetry exists when a party or parties possess greater informational awareness pertinent to active participation in a given situation relative to other participating parties. Information asymmetry often stems from inadequate information sharing and can result in negative consequences for both the information poor and the information rich (Gavin, Trond & Archer, 2007). Information asymmetry in the credit market becomes more apparent and its effects crucial in those situations which banks are less aware and the borrowers of the risks assumed in financing a project or of their real payment ability, in the case of individuals (Barbosa & Marcal, 2011). In borrowing, asymmetric information challenges stem from the fact that a lender's knowledge of a borrower's possibility of repaying (risk profile) is imprecise and must be inferred based upon available information (Turner & Varghese, 2010).

The information asymmetry can be resolved directly through appraisal or indirectly through screening, signaling, or contingent payments. Information acquisition by financial intermediaries is an essential function. Credit bureaus are an institutional solution to the problems of information asymmetries and moral hazard in credit markets. The shared information allows a lender better to assess the risk profile of a potential borrower and introduce incentives to have a borrower pay on time in the form limiting a borrower's future ability to access credit from other credit institutions (Turner & Varghese, 2010). Thus, credit bureaus create a different form of collateral reputation that can be used to screen potential borrowers when granting loans. Considering credit histories or on other type of reputation collateral a borrower can gain access to credit (Galindo & Micco, 2010). Therefore, sharing of credit information helps financial institutions to alleviate problems caused by asymmetric information (Grajzl & Laptieva, 2011).

2.2.2 Adverse Selection Theory

The adverse selection model emanated from Stiglitz and Weiss (1981). According to the adverse selection mechanism, only risky borrowers have incentives to pay more and to get loans, not the safe borrowers. The adverse selection is a problem of asymmetric information and occurs before the transaction. This problem arises where there is a hidden characteristics problem and people on the informed side of the market self-select in a way that is harmful to the uninformed side. The problem of adverse selection arises in situations where there is information asymmetry. In adverse selection, the party with relatively poor information draws a selection with relatively less attractive characteristics (Tumay, 2009).

The adverse selection problem takes place when borrowers have private information about their personal behavior and the project they want to base their investment before the credit relationship begins. While the lender may have a good idea about the average characteristics of the pool of potential borrowers, he may not have full information on the characteristics of each borrower and the riskiness of his project (Mehrteab, 2005). Adverse selection is an important issue facing banks since not all borrowers and projects applying for bank loans should be funded; however, since banks do not have the same information as their applicants, deciding which of them are creditworthy can be difficult (Karapetyan & Stacescu, 2014).

Information sharing among creditors can either increase or decrease the volume of credit since when lenders exchange information on borrowers; information sharing reduces adverse selection (Grajzl & Laptieva, 2011). Accordingly, information sharing reduces adverse selection by improving banks information on credit applicants. Reducing information asymmetry between lenders and borrowers leads to

credit registries allowing loans to be extended to safe borrowers who had previously been priced out of the market, resulting in higher aggregate lending. Information sharing reduces adverse selection by improving the pool of borrower since each bank has private information about local credit applicants but has no information about non-local credit applicants (Jappelli & Pagano, 2005).

2.2.3 Moral Hazard Theory

The moral hazard theory was developed by Suglitz (1983). The moral hazard problem is one more class arising from situations with asymmetrical information (Barbosa & Marcal, 2011). The moral hazard problem implies that a borrower has the excuse to default unless there are consequences for his future applications for credit. This result from the difficulty lenders have in assessing the level of wealth borrowers will have accumulated by the date on which the debt must be repaid, and not at the time of application (Mwengei, 2013). The moral hazard hypothesis, argue that banks with relatively low capital respond to moral hazard incentives by increasing the riskiness of their loan portfolio, which in turn results in higher non-performing loans on average in the future (Klein, 2013).

Moral hazard occurs in credit markets if raising the interest rate induces borrowers, who have a choice of projects, to invest in a project that yields the bank a lower return than another project in which the borrowers could have invested (Mehrteab, 2005). Additionally, moral hazard arises because an individual or institution does not take the full consequences and responsibilities of its actions, and therefore has a tendency to act less carefully than it otherwise would, leaving another party to hold some responsibility for the consequences of those actions (Jappelli & Pagano, 2000). In

moral hazard problem one side of the economic activity engages in activities that are undesirable for the other side in terms of their agreement (Tumay, 2009).

Information exchange can reduce moral hazard by raising borrowers' incentives to comply with contractual obligations (Artigas, 2004). The combination of default information tends to correct moral hazard problems, and its ability to do so is actually reduced if borrower characteristics are also disclosed (Jappelli & Pagano, 2000). Galindo and Micco, (2010) posits that moral hazard can also be reduced through information sharing, by imposing discipline on debtors. The power of incentives depends on the information on past behavior shared by credit bureaus Information sharing can succeed moral hazard on the part of borrowers, motivating them to exert greater effort in projects (Brown and Zehnder, 2007). Thus, the exchange of blacklists of defaulting borrowers between lenders can be an effective discipline device to mitigate various forms of moral hazard, reducing interest rates in credit markets (McIntosh & Wydick, 2007).

2.3 Determinants of Non-Performing Loans in Microfinance Banks

According to Saba, Kouser and Azeem (2012) the reason behind the bad debts is low repayment capacity of borrowers, which in turn is the result of poor economic use of loans, low per capita, and high interest rate. Extra flexible credit rationing policy could also be the reason of high NPLs rate. Thus, this study will explore interest rates, inflation and economic performance as the main determinants of nonperforming loans in microfinance banks.

2.3.1 Interest rates

Interest rate is the price a borrower pays for the utilitize money they borrow from a financial institutions or fee paid on borrowed assets. Interest rate affects the difficulty

in servicing debt, in the case of floating rate loans. This implies that the effect of the interest rate should be positive, and as a result, the increasing debt burden caused by rising interest rate payments should lead to a higher number of NPLs (Louzis, Vouldis & Metaxas, 2010). According to Saba, Kouser and Azeem (2012) posit that excess financing and interest rate (high) is regarded as the main reason for high rate of NPLs in US banking sector. Thus, interest rate hikes affect the ability to service the debt, particularly in the case of floating rate loans (Klein, 2013).

The interest rate used by banks takes account of a premium for the risk in case the loans default (Rizvi & Khan, 2015). Commercial bank charges higher interest rates to riskier clients, if a high interest rate is charged to those borrowers who have already substandard record to repay the loans is also a factor causing non-performing loans. Thus, an increase in interest rate weakens loan payment capacity of the borrower therefore non-performing loans and bad loans are positively correlated with the interest rates (Farhan et al., 2012). Higher interest rates or discount rates also reduce the present value of cash flows, which would reduce the attractiveness of investment. As such, loan interest rate is positively related to nonperforming loans since it means that the cost of borrowing will increase so people with have to pay more and they may not be able to make this payment if the loan interest rate increases (Turan & Koskija 2014).

2.3.2 Inflation

Inflation is the sustained and pervasive increment in aggregate price of goods and services resulting slump in purchasing power of money (Gezu, 2014). Inflation is also defined as the percentage increases of a reference index, the Consumer Price Index (CPI), which is a representative of a common basket of goods and services (Rizvi &

Khan, 2015). Higher inflation can make debt servicing easier by reducing the real value of an outstanding loan, but on the other hand, reduce the borrowers' real income when wages are sticky. In countries where the borrowing rates are variable, higher inflation can also lead to higher rates resulting from the monetary policy actions to combat inflation (Klein, 2013).

Inflation reduces the debt servicing capacity of the loan holders as lenders adjust the lending interest rates to adjust their real return. Hence, the relationship between inflation and non-performing loans can be positive or negative depending on the economy of operations (Farhan et al., 2012). According to Turan and Koskija (2014), inflation is positively related to nonperforming loans. An increase of inflation forces monetary regulators to increase interest rate to control inflation, which means that there will be an increase in the cost of borrowing. Unexpected inflation profits borrowers at the expense of lenders (Rizvi & Khan, 2015).

2.3.2 Economic Growth

Beck, Jakubik and Piloiu (2013) observe that real real gross domestic product (GDP) growth is one of the main driver of nonperforming loan ratios. Consequently, a drop in global economic activity remains the most important risk for bank asset quality. Higher real GDP growth usually translates into higher income, which improves the debt servicing capacity of borrowers (Klein, 2013). The growth in the gross domestic product usually increases the income, which ultimately enhances the loan payment capacity of the borrower, which in turn contributes to lower bad loan and vice versa. Thus, poor economic conditions are also a cause of loan losses (Farhan et al., 2012). Skarica (2013) also argue that GDP is the main driver of nonperforming loans and that the high levels of NPLs are the legacy of the crisis.

According to Turan and Koskija (2014) real gross domestic product (GDP) is negatively related to nonperforming loans and an overall increase of GDP brings economic growth to a country so when it raises the level of nonperforming loan decreases. Conversely, when there is a decline in the economy the level of nonperforming loans is likely to increase as unemployment rises and borrowers face greater challenges in repayment of their debt (Klein, 2013). In addition, Rizvi and Khan (2015) posit that there is a substantial inverse association between gross domestic product and non-performing loans, which means that high performance in the real economy consequences in lower non-performing loans.

2.4 Empirical Review

Using OLS robust standard errors regression model, Kusi and Ansah-Adu (2015) investigated credit information sharing and its effect on access to bank credit across income bracket groupings. The study used secondary data from World Development Indicators covering period's between 2000 and 2012. The study findings revealed that access to bank credit varies significantly across the five income bracket groupings with high-income brackets having easier access to bank credit compared to their low-income brackets counterparts. The study findings also revealed that information sharing helps improves access to bank credit across all the five income bracket groupings. Further, the study found that information sharing and gross domestic savings were significantly and positively correlated to access to bank credit while gross capital formation, inflation, and non-performing loans were negatively and significantly related to access to bank loans.

Bos, Haas and Millone (2015) carried out a study on sharing borrower information in a competitive credit market in Bosnia and Herzegovina. The study findings revealed

that compulsory information sharing tightens lending at the extensive margin as more applications are rejected, particularly in areas with strong credit market competition. The study also revealed that lending standards also tighten at the intensive margin: the registry leads to smaller, shorter and more expensive loans. Finally, the study revealed that tightening of lending along both margins improves loan quality and default rates go down, particularly in high-competition areas and for first time borrowers hence an indication that a reduction in adverse selection is an significant channel through which information sharing affects loan quality.

Sorge and Zhang (2010) investigated private and public credit registries and legal creditor rights as determinants of corporate debt maturity in 45 countries. The study found that information sharing among creditors and legal protection of creditor rights are associated with higher ratios of long-term corporate debt to total corporate debt. The study also revealed that ex-ante better credit information acts as a substitute for ex-post stronger creditor protection in expanding the maturity of corporate debt in less developed countries. Finally, the study established that regulations requiring that both positive and negative credit information be distributed and that secured creditors are paid first in bankruptcy impact corporate debt maturity across countries.

Brown and Zehnder (2007) examined how asymmetric information and competition in the credit market affect voluntary information sharing between lenders. The study examined an experimental credit market in which information sharing can aid lenders to distinguish good borrowers from bad ones because borrowers may exogenously switch locations. The study findings indicated that asymmetric information in the credit market increases the frequency of information sharing between lenders significantly and competition between lenders reduces information sharing, but the impact of competition appears to be only of second order importance.

Brown, Jappelli and Pagano (2007) investigated whether information sharing among banks has affected credit market performance in the developed countries of Eastern Europe and the former Soviet Union, using a large sample of firm-level data. The study estimates revealed that information sharing is affiliated to improved availability and lower cost of credit to firms and that this correlation is stronger for opaque firms than transparent firms. In cross-sectional estimates, the study found that control for variation in country-level aggregate variables that may affect credit, by examining the differential impact of information sharing across firm types.

In their study, Jentzsch and Rientra (2003) studied information sharing and its implications for consumer credit markets in the United States and Europe. The study compared selected European countries with the United States with emphasizes on cross-border information transfers in Europe. The study found that European countries display an unbalanced transposition of data protection regulations that may hamper cross-border information exchange as well as credit market assimilation. Further, the study revealed that profound and broad credit markets and an intensely competing credit reporting industry characterized the U.S.

Mugwe and Oliweny (2015) examined the impact of credit information sharing on the performance of commercial banks in Kenya. The study collected data from the 43 commercial banks in Kenya for the period between 2005 and 2014 on an annual basis. The collected was the profit before tax and the number of credit reports accessed by banks from 2010 to 2014 on a quarterly basis. The study adopted a correlational research design. The findings of the study revealed that the return on equity, return on assets and net interest margin had an upward trend after the licensing of Credit Reference Bureaus (2010 to 2014) associated with a descending trend for the period before the initiation of credit information sharing (2005 to 2009).

Toroitich and Omwono (2015) assessed the relationship between non-performing loans and the Financial Performance of Equity Bank (K) ltd, Eldoret Town. The study adopted a correlation research design and secondary data, which was obtained from the bank's financial statements from year 2008-2014. The findings of the study established that when the non-performing loans increased, the performances of equity bank branches were affected negatively. The study recommended that the credit department staff should have higher loan targets as this contributes significantly to the profits of the bank. The study also recommended that the non-performing loans should be kept at the minimum.

Kiage, Musyoka and Muturi (2015) investigated the influence of positive credit information sharing determinants among commercial banks in Kisii town, Kenya. The study sampled 34 credit managers and branch managers from 17 commercial banks and collected data using a questionnaire. The study findings established that costs of information sharing had an adverse influence on the financial performance of commercial banks and that privacy protection had a negative influence on financial performance of commercial banks. The study recommended that financial institutions and credit bureaus should safeguard private information which they hold.

Osoro et al. (2015) investigated credit reference bureau and its influence on the performance of banks in Eldoret, Kenya during the period 2005-2011. The study selected a sample of 97 respondents using simple random sampling and data collection sheets to collect data. The study findings revealed that there was a high number of defaults in the year 2008 and the lowest in the year 2010 with only 15.9% being defaulted. The study also revealed that wholesalers were the greatest defaulters with a default rate of 41.6% while mining companies and electricity, gas and water supply companies both had the least default rate of 0.9% each. The study

recommended that lenders should appreciate the need for strategic control systems and consequently be able to develop other strategic control measures while enhancing the effectiveness of CRB.

Shisia et al. (2014) analyzed the role of (CRB) in the management of nonperforming loans in Kenya's banking industry. The study used secondary sources from financial reports, library, and banks' records such as in-house magazines, journals, publications as well as website and other resourceful information available for 5 years from 2008 to 2013. The study findings established that the CRB plays a major role in managing nonperforming loans. Regression results revealed that reputation. Collateral and blacklisting have both positive and negative effect respectively on the management of bad debt in Kenya's Banking industry. The study recommended that CRB firms in Kenya should link with other regional CRB firms in other countries as to have information on credit histories of those crossing the borders.

Ng'etich and Wanjau (2011) analyzed the effects of interest rate spread on the level of non-performing Assets in commercial banks in Kenya. The study carried out a census of the 43 commercial banks in Kenya and used questionnaires to collect data. The study concluded that interest rate spread affect performing assets in banks as it increases the cost of loans charged on the borrowers, regulations on interest rates have far-reaching effects on assets non-performance, for such regulations determine the interest rate spread in banks and help mitigate moral hazards incidental to NPAs. The study recommended that commercial banks in Kenya should assess their clients and charge interest rates accordingly as ineffective interest rate policy can increase the level of interest rates and consequently NPAs.

2.5 Conceptual Framework

A conceptual framework is used to explain the relationship between the independent variables and the dependent variable. The independent variable for this study is credit information sharing whereas the dependent variable is non-performing loans and the control variables includes interest rates, inflation and economic growth as shown by figure 2.1 below

```
┌─────────────────────────────┐              ┌─────────────────────────────┐
│   Independent variable      │              │    Dependent variable       │
│                             │─────────────▶│                             │
│ Credit information sharing  │       ▲      │ Nonperforming loans (NPL)   │
└─────────────────────────────┘       │      └─────────────────────────────┘
                                       │
                          ┌────────────────────────┐
                          │   Control Variables     │
                          │  • Interest rates       │
                          │  • Inflation            │
                          │  • Economic growth      │
                          └────────────────────────┘
```
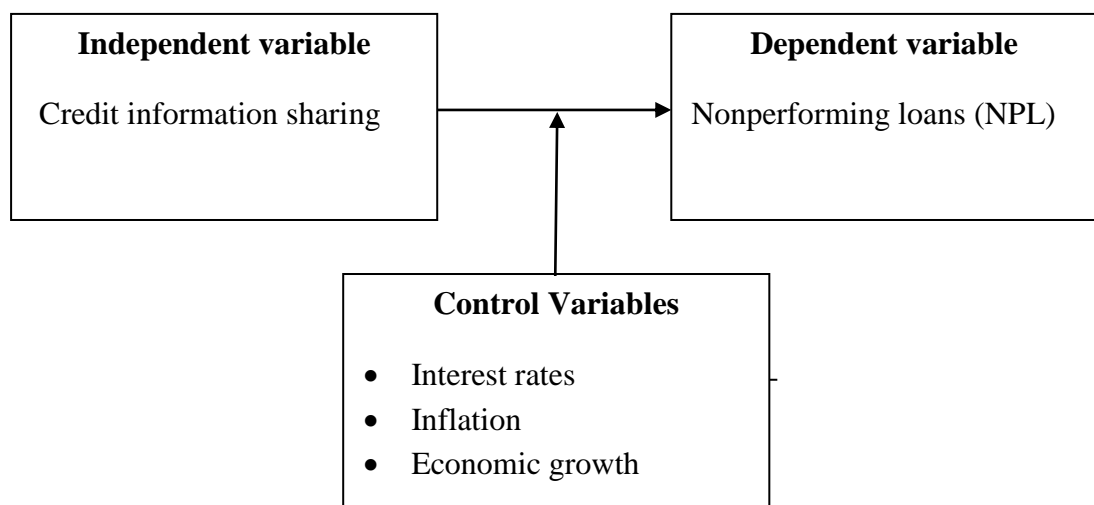
Figure 2.1 Conceptual Framework

2.6 Summary of Literature Review

A review of past studies shows credit information sharing improves the banks' knowledge of applicants' characteristics and permits a more accurate prediction of their repayment probabilities, reduces the informational rents that banks could otherwise extract from their customers and operates as a borrower discipline device. In addition, the studies have revealed that the systematic use of credit reports in assessing loan applications is one of the most remarkable developments in retail banking. However, most of the studies on the importance of credit information sharing in reducing information asymmetry, adverse selection, and moral hazards concentrate more on commercial banks despite the fact that the microfinance industry

globally is meeting difficulties as funding dries up and delinquencies rise. Another observation is that Africa remains the region of the world with the least developed credit information systems, despite the exploding microfinance sectors in many African countries and Kenya in particular.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research procedures that were used to carry out the study. The chapter outlines the research design, the population of the study and data collection procedure. Additionally, the chapter presents the data analysis method, which entails the analytical framework and the tests of significance.

3.2 Research Design

According to Beri (2008), a research design is a detailed plan of research specifying the methods and procedures for collecting and analyzing data on a given subject and reporting the results. This study employed a descriptive research design. Descriptive research entails collecting data in order to test hypotheses or to answer questions concerning the status of the subjects in the study (Gay et al., 2006). According to Robson (2008), descriptive studies are intended to portray an accurate profile of the persons, events, and situation. Descriptive research is relevant as it explains the current status of a phenomenon and is concerned with finding out the what, where and how of a phenomenon (Ngechu, 2004).

3.3 Population of the Study

A population is a universal set of study of all members of a real or hypothetical set of people, events or objects to which an investigator generalized the result. The population of this study entailed all the 11 microfinance banks registered by the Central Bank of Kenya.

3.4 Data Collection

This study used secondary data. Annual data on non-performing loans was obtained from the microfinance banks financial statements while data on credit information sharing was obtained from the central bank of Kenya banking supervision department. Annual credit reports pulled by microfinance banks from the two licensed credit reference bureaus was obtained. The data covered a period of 5 years from 2011 – 2015.

3.5 Data Analysis

The data collected was sorted, summarized and then analyzed using descriptive and inferential statistics. Descriptive statistics refers to statistics that describe the phenomena of interest and includes frequencies, mean and extent of variability in the set (Sekaran, 2003). Inferential statistics gave information on how the variables relate to each other.

3.5.1 Analytical Model

This study used the regression model to determine the relationship between credit information sharing and non-performing loans in microfinance banks in Kenya. The regression equation was as follows: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Where: Y = Nonperforming loan rate measured using the loan loss ratio which is a proxy of NPLs divided by total loans

X_1 = Credit Information Sharing measured by annual credit reports pulled by each microfinance bank at time t

X_2 = Interest rate measured using annual lending rates

X_3 = Inflation rate measured using the consumer price index

X_4 = Economic growth measured using the GDP growth rate

β_o = Constant

$\beta_1 - \beta_4$ = Coefficients of the regression model

ε = Error term

3.5.2 Test of Significance

The F and t tests was used to test statistical significance where F test was used to determine the significance of the analytical model while t – test helped to determine the significance of the coefficients of the regression model where a t value greater than two (t>2) was considered significant at 5% significance level. The study also used the Durbin Watson statistic and the Variance Inflation Factor (VIF) to check for collinearity and multicollinearity between the study variables respectively.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND INTERPRETATION

4.1 Introduction

This chapter provides the results from the analyzed data. The chapter entails the descriptive statistics, the correlation results, regression results and the interpretation of the research findings.

4.2 Response Rate

The study targeted 11 microfinance banks registered by the Central Bank of Kenya but complete data was obtained for 7 only MFB which had been operation since 2011. The 7 banks made up a sample of 64% which was sufficient to carry out data analysis.

4.3 Descriptive Statistics

Table 4.1 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NPL	35	.0369	.6076	.172301	.1349238
CIS	35	.0000	11.136	5.368571	3.9783947
Interest Rates	35	8.4825	15.4375	10.284000	2.6974199
CPI	35	121.1654	159.5989	140.628249	13.5184696
GDP	35	2.1000	7.2500	4.735000	1.9121631

Source: Research Findings

The findings on table 4.1 show the summary of the descriptive statistics. The results indicate that the average ratio of nonperforming loans was 0.1723 while the average numbers of credit reports pulled were 5.37 with minimum and maximum values of 0.0 and 11.14, which indicates that some MFB has not pulled data with any of the credit reference bureau. The results also indicate that the average interest rates were 10.28 with lowest and highest interest rates being 8.48 and 15.44 respectively. The results

also indicate that the average CPI was 140 with minimum and maximum CPI being 121.17 and 159.6. The findings also show that average GDP growth rate was 4.74 with minimum and maximum GDP values of 2.1 and 7.25 respectively.

4.4 Correlation Analysis

Table 4.2 Correlations

	NPL	CIS	Interest Rates	Inflation (CPI)	GDP
NPL	1				
CIS	-.135	1			
Interest Rates	-.009	-.146	1		
Inflation (CPI)	.210	.822**	-.129	1	
GDP	.113	.232	-.370*	.449**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Research Findings

The correlation results on table 4.2 indicate that non-performing loans had a negative correlation with credit information sharing (CIS) and interest rates. The results also indicate that non-performing loans had a positive correlation with inflation and economic growth. This indicates that there is a negative correlation between NPL and credit information sharing (CIS) and interest rates but a negative correlation with inflation and economic growth.

4.5 Regression Results

The regression results present the model summary, the analysis of variance results (ANOVA) and the summary of the regression coefficients.

4.5.1 Model Summary

The model summary results are illustrated in table 4.3 as follows

Table 4.3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.599[a]	.358	.273	.1150676	2.335

a. Predictors: (Constant), GDP, CIS, Interest rate, Inflation (CPI)

b. Dependent Variable: NPL

Source: Research Findings

The model summary results on table 4.3 indicate that the coefficient of determination (R^2) is 0.358, which indicates that 35.8% of the variation in Non-performing loans is explained by the independent variable (CIS) and the control variables (interest rates, inflation and economic performance). This indicates that 64.2% of the variation is explained by other factors not considered by the model. The results also show that there is a strong correlation between the research variables as indicated by the correlation coefficient of 0.599. The findings also indicate that the Durbin Watson statistics is 2.335, which lies between the recommended values of 1-4 hence an indication of the absence of collinearity between the study variables.

4.5.2 ANOVA

Table 4.4 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	.222	4	.055	4.186	.008[b]
1	Residual	.397	30	.013		
	Total	.619	34			

a. Dependent Variable: NPL

b. Predictors: (Constant), GDP, CIS, Interest Rates, Inflation rate

Source: Research Findings

The ANOVA results on table 4.4 indicates that the regression model is significant at 95% confidence level since the F-statistics value of 4.186 is significant as the P-value 0.008 is less than 0.05. This means the model is fit to explain the relationship between credit information sharing and non-performing loans in microfinance banks in Kenya.

4.5.3 Regression Coefficients

Table 4.5 Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.128	.348		-3.244	.003		
	CIS	-.035	.009	-1.037	-3.825	.001	.291	3.439
	Interest rate	-.004	.008	-.083	-.519	.608	.832	1.202
	Inflation (CPI)	.011	.003	1.136	3.851	.001	.246	4.066
	GDP	-.013	.013	-.187	-1.013	.319	.630	1.588

a. Dependent Variable: NPL

Source: Research Findings

From the findings in table 4.5 the following regression equation can be generated

$$Y = -1.128 - .035X_1 - .004X_2 + .011X_3 - .013X_4 + \varepsilon$$

From the generated regression equation, the results indicate that credit information sharing has a significant negative relationship with non-performing loans. The results also show an insignificant negative relationship between interest rates and economic growth. Finally, the results show an insignificant positive relation between inflation and non-performing loans of microfinance banks in Kenya. The results also indicate that all the Variance Inflation factors (VIF) are less than 5 and more than 1 which indicates that there is no multicollinearity between the variables of the research.

4.6 Interpretation of the Findings

The findings of this study found that credit information significantly and negatively affects the level of nonperforming loans in microfinance banks in Kenya. This indicates an inverse relationship between credit information sharing and the level of nonperforming loans in MFBs in Kenya hence, failure to share credit information adversely affects non-performing loans of MFBs. As such, Brown, Jappelli and Pagano (2007) revealed that information sharing is affiliated to improved availability and lower cost of credit to firms and that this correlation is stronger for opaque firms than transparent firms. Bos, Haas and Millone (2015) also revealed that tightening of lending along both margins improves loan quality and default rates go down, particularly in high-competition areas and for first time borrowers hence an indication that a reduction in adverse selection is a significant channel through which information sharing affects loan quality.

The study also found that interest rates and economic growth negatively but insignificantly influence the level of nonperforming loan in microfinance banks in Kenya. This indicates that an increase in interest rates increases the level of nonperforming loans while low economic growth also adversely affects the level of nonperforming loans. As such, Farhan et al. (2012) found that an increase in interest rate weakens loan payment capacity of the borrower therefore non-performing loans and bad loans are positively correlated with the interest rates. According to Saba, Kouser and Azeem (2012) posit that excess financing and interest rate (high) is regarded as the main reason for high rate of NPLs. According to Turan and Koskija (2014), real gross domestic product (GDP) is negatively related to nonperforming loans and an overall increase of GDP brings economic growth to a country so when it raises the level of nonperforming loan decreases. Rizvi and Khan (2015) posit that

there is a substantial inverse association between gross domestic product and non-performing loans, which means that high performance in the real economy consequences in lower non-performing loans.

Further, the study found that inflation has a positive but an insignificant effect on the level of nonperforming loan in microfinance banks in Kenya. This indicates a direct relationship between inflation and the level of nonperforming loans of microfinance banks in Kenya. As such, Rizvi and Khan (2015) revealed that an increase of inflation forces monetary regulators to increase interest rate to control inflation, which means that there will be an increase in the cost of borrowing. Unexpected inflation profits borrowers at the expense of lenders.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the research, provides the study conclusions and recommendation based on the findings. The chapter also presents the limitations of the study and recommendations for further research.

5.2 Summary

This study sought to explore the relationship between credit information sharing and non-performing loans of microfinance banks in Kenya. The independent variable for this study is credit information sharing whereas the dependent variable is non-performing loans and the control variables includes interest rates, inflation and economic growth. The study targeted 11 microfinance banks registered by the Central Bank of Kenya but complete data was obtained for 7 only microfinance banks which had been operation since 2011.

The findings of the study established that the average level of nonperforming loans was 0.1723 whereas the average numbers of credit reports pulled were 5.37 while the average interest rates were 10.28. In addition, the study found that the average CPI was 140 and average GDP growth rate was 4.74 respectively. The correlation results found that non-performing loans had a negative correlation with credit information sharing (CIS) and interest rates but a positive correlation with inflation and economic growth.

The regression findings found that 35.8% of the variation in non-performing loans was explained by the independent variable (CIS) and the control variables (interest rates, inflation and economic growth). Additionally, the study found that the Durbin Watson statistics value was 2.335, which lies between the recommended values of 1-4 hence an indication of the absence of collinearity between the study variables. The ANOVA found that the regression model was fit to explain the relationship between credit information sharing and non-performing loans in microfinance banks in Kenya.

The results also found that credit information sharing had a significant negative relationship with non-performing loans whereas interest rates and economic growth had an insignificant negative relationship with the level of non-performing loans. The results further found an insignificant positive relation between inflation and non-performing loans of microfinance banks in Kenya. Finally, the findings revealed that all the Variance Inflation factors (VIF) were less than 5 and more than 1 hence an indication of absence of multicollinearity between the hypothesized variables.

5.3 Conclusion

The study findings revealed that that credit information significantly and negatively affects the level of nonperforming loans in microfinance banks in Kenya. This leads to the conclusion that that there is an inverse significant relationship between credit information sharing and the level of nonperforming loans in MFBs hence, failure to share credit information adversely affects non-performing loans of Microfinance banks in Kenya.

The study also found that interest rates and economic growth negatively but insignificantly influence the level of nonperforming loan in microfinance banks in Kenya. This leads to the conclusion that an increase in interest rates increases the

level of nonperforming loans while low economic growth also adversely affects the level of nonperforming loans. Finally, the study found that inflation has a positive but an insignificant effect on the level of nonperforming loan in microfinance banks in Kenya. This leads to the conclusion that there is a direct relationship between inflation and the level of nonperforming loans of microfinance banks in Kenya.

5.4 Recommendations

The study found an inverse relationship between credit information sharing and the level of nonperforming loan in microfinance banks in Kenya. The study recommends that leadership of microfinance banks should enhance the sharing of credit information to ensure that they reduce the levels of nonperforming loans in their banks.

The study found that interest rates, economic growth and inflation affect the level of nonperforming loan in microfinance banks in Kenya. These variables are all microeconomic factors, which affect non-performing loans. The study thus recommends that the government of Kenya should institute policy measures to ensure that interest rates, inflation and economic performance do no increase loan default in microfinance banks in Kenya.

5.5 Limitations of the Study

This study was limited to the relationship between credit information sharing and non-performing loans in microfinance banks in Kenya. The findings of the study thus affect microfinance banks, which are, regulate and registered by the Central Bank of Kenya. The findings are also limited to microfinance banks and not other financial institutions like commercial banks, saving and credit cooperative societies and credit only microfinance banks in Kenya.

5.6 Suggestions for Further Research

The study concentrated on non-performing loans, credit information sharing and incorporated control variables like inflation, interest rates and economic growth but there are other factors, which affect non-performing loans in Microfinance Banks. The study thus suggests a study on the other factor affect the non-performing loan in MFBs. The study also recommends an examination on the relationship between credit information sharing and financial performance of microfinance banks.

REFERENCES

Aduda, J. & Gitonga, J. (2011). The Relationship between Credit Risk Management and Profitability among the Commercial Banks in Kenya. *Journal of Modern Accounting and Auditing,* 7(9), 934-946.

Ahmad, F. (2013). Corruption and Information Sharing as Determinants of Non-Performing Loans. *Business Systems Research,* 4(1), 87-98.

Alastair, M. S. (2015). Inclusive Growth: Improving Microfinance Regulation to Support Growth and Innovation in Micro-enterprise: The Republic of Kenya Background Country Report. Informal Economic Observatory.

Artigas, C. T. (2004). A Review of Credit Registers and their Use for Basel II. Bank of Spain

Barbosa, R. C. & Marçal, E. F. (2011). The Impacts of Information Asymmetry in Determining Bank Spreads. *RGPP.,* 1(2), 113-130.

Beck, R., Jakubik, P. & Piloiu, A. (2013). Non-Performing Loans: What Matters in addition to the Economic Cycle? *Working Paper Series No. 1515.* European Central Bank

Beri, G.C. (2008). Marketing Research. 4th Ed. New Delhi. Tata McGraw-Hill publishing

Bos, J., Haas, R. & Millone, M. (2015). Sharing Borrower Information in a Competitive Credit Market. Working Paper No. 180. European Bank for Reconstruction and Development

Boudriga, A., Boulila, N. & Jellouli, S. (2009). Does Bank Supervision affect Nonperforming Loans: Cross-Country Determinants Using Aggregate Data? Unpublished Manuscript

Boudriga, A., Taktak, N. B. & Jellouli, S. (2009). Banking Supervision and Nonperforming Loans: A Cross-Country Analysis. *Journal of Financial Economic Policy,* 1(4), 286-318

Brown, M. & Zehnder, C. (2007). The Emergence of Information Sharing in Credit Markets. FMA European conference, University of Zurich

Brown, M., Jappelli, T. & Pagano, M. (2007). Information Sharing and Credit: Firm-Level Evidence from Transition Countries. *Working Paper No. 178.* Centre for Studies in Economics and Finance – University of Salerno

Credit Reference Bureau Regulations. (2013). Credit Reference Bureau Regulations 2013: Arrangement of Regulations. National Council for Law Reporting

Curak, M., Pepur , S. & Poposki, K. (2013). Determinants of Non-Performing Loans – Evidence From Southeastern European Banking Systems. *Banks and Bank Systems,* 8(1), 45 - 53

Farhan, M., Sattar, A., Chaudhry, A. H. & Khalil, F. (2012). Economic Determinants of Non-Performing Loans: Perception of Pakistani Bankers. *European Journal of Business and Management,* 4(19), 87 -99

Financial Sector Deepening (FSD) Kenya. (2011). Supporting the Development of Inclusive Financial Markets in Kenya. Financial Sector Deepening

Financial Sector Deepening (FSD) Kenya. (2013). Credit Reference Project - Phase II Mid Term Review. Financial Sector Deepening Kenya

Financial Sector Deepening (FSD) Kenya. (2014). Impact Assessment of Financial Market Development through the Lens of Complexity Theory. Financial Sector Deepening Kenya.

Galindo, A. & Micco, A. (2010). Information Sharing and Access to Finance of SMEs: Cross Country Evidence from Survey Data. *Working Papers No. 2010/06,* Documentos De Trabajo, Venezuela

Gavin, C., Trond, E. J. & Archer L. B. (2007). Information Asymmetry and Information Sharing. *Government Information Quarterly,* 24, 827–839

Gietzen, T. (2016). The Impact of Credit Information Sharing on Interest Rates. Working Papers on Finance No. 2016/12. Swiss Institute of Banking and Finance. Available at http://ssrn.com/abstract=2798531

Grajzl, P. & Laptieva, N. (2011). Information Sharing and the Volume of Private Credit in Transition: Evidence from Ukrainian Bank-Level Panel Data. A paper presented at the conference of the International Finance and Banking Society in Rome.

Idama, A., Asongo A.I. & Nyor, N. (2014). Credit Risk Portfolio Management in Microfinance Banks: Conceptual and Practical Insights. *Universal Journal of Applied Science,* 2(6), 111-119

Janvry, A., McIntosh, C. & Sadoulet, E. (2006). The Supply and Demand Side Impacts of Credit Market Information. U.C. San Diego

Jappelli T. & Pagano, M. (2005). Role and Effects of Credit Information Sharing. Working Paper No. 136. Available at https://www.researchgate.net/publication/23573857

Jappelli, T. & Pagano, M. (2000). Information Sharing in Credit Markets: A Survey. *Working Paper No. 36.* Centre for Studies in Economics and Finance

Jappelli, T. & Pagano, M. (2002). Information Sharing, Lending and Defaults: Cross-Country Evidence. *Journal of Banking & Finance,* 26, 2017–2045

Jayadev, M. & Rao, R. N. (2012). Financial Resources of the Microfinance Sector: Securitization Deals - Issues and Challenges: Interview with the MFIs Grameen Koota and Equitas. *IIMB Management Review,* 24, 28 - 39

Jentzsch, N. & Rientra, A. S. J. (2003). Information Sharing and Its Implications for Consumer Credit Markets: United States vs. Europe. European University Institute Workshop

Kamau, M. K., Namiinda, B. & Buluma, F. (2016). Effects of System Integrity in Credit Information Sharing on Management of Credit Risk in Commercial Banks in Nakuru Town, Kenya. *IOSR Journal of Business and Management,* 18(2), 52-57

Karapetyan, A. & Stacescu, B. (2010). Information Sharing and Information Acquisition in Credit Markets. *Working Paper 2010/24.* Norges Bank

Karapetyan, A. & Stacescu, B. (2014). Does Information Sharing Reduce the Role of Collateral as a Screening Device? *Journal of Banking and Finance*, 43, 48-57

Kiage, E., Musyoka, F. M. & Muturi, W. (2015). Influence of Positive Credit Information Sharing Determinants on the Financial Performance of Commercial Banks in Kenya: A Survey of Commercial Banks in Kisii Town. *International Journal of Economics, Commerce, and Management,* 3(3), 1 - 13

Kisengese, W. K. (2014). The Impact of Credit Information Sharing on the Level of Non - Performing Loans of Commercial Banks in Kenya. *Unpublished MBA Project.* United States International University, Africa

Klein, N. (2013). Non-Performing Loans in CESEE: Determinants and Macroeconomic Performance. *IMF Working Paper WP/13/72*. International Monetary Fund

Kusi, B. A. & Ansah-Adu, K. (2015). Credit Information Sharing and its Impact on Access to Bank Credit across Income Bracket Groupings. *International Journal of Economics, Finance and Management,* 4(4), 138-145

Louzis, D. P., Vouldis, A. T. & Metaxas, V. L. (2010). Macroeconomic and Bank-Specific Determinants of Non-Performing Loans in Greece: A Comparative Study of Mortgage, Business, and Consumer Loan Portfolios. *Working Paper No. 118.* Bank of Greece

Luoto, J., McIntosh, C. & Wydick, B. (2007). Credit Information Systems in Less Developed Countries: A Test with Microfinance in Guatemala. *Economic Development and Cultural Change,* 55 (2), 313-334.

Maina, J. D., Kinyariro, D. K., Muturi, H. M. & Muriithi, M. J. (2016). Credit Information Sharing and Level of Loan Default in Deposit Taking SACCO's in Meru County, Kenya. *International Journal of Economics, Commerce and Management,* 4(4), 604 – 617

McIntosh, C. & Wydick, B. (2004). A Decomposition of Incentive and Screening Effects in Credit Market Information Systems. *Working Paper.* University of San Francisco

McIntosh, C. & Wydick, B. (2007). Adverse Selection, Moral Hazard, and Credit Information Systems: Theory and Experimental Evidence. University of California at San Diego

Mehrteab, T. H. (2005). Adverse Selection and Moral Hazard in Group-Based Lending: Evidence from Eritrea. *Unpublished Thesis.* University of Groningen

Mugwe, M. W. & Olweny, T. (2015). The Effect of Credit Information Sharing on the Performance of Commercial Banks in Kenya. *International Journal of Business and Commerce,* 5(3), 41-63

Munee, T. A. (2013). Effect of Credit Information Sharing on the Financial Performance of Commercial Banks in Kenya. *Unpublished MBA Project.* University of Nairobi

Mwengei K. B. (2013). Assessing the Factors Contributing to Non –Performance Loans in Kenyan Banks. *European Journal of Business and Management,* 5(32), 155-162

Ng'etich, J. C. & Wanjau, K. (2011). The Effects of Interest Rate Spread on the Level of Non-Performing Assets: A Case of Commercial Banks in Kenya. *International Journal of Business and Public Management,* 1(1), 58-65

Ngechu. M. (2004). Understanding the Research Process and Methods. An Introduction to Research Methods. Acts Press, Nairobi

Ocharo, O. F. (2013). The Effect of Credit Information Sharing on the Non-Performing Loans among Commercial Banks in Kenya. *Unpublished MSc Project.* University of Nairobi

Omitogun, O., Olanrewaju, D. & Alalade, Y. M. A. (2016). Loans Default and Return on Assets in the Nigerian Banking System. *International Journal of Economics and Financial Research,* 2(4), 65-73

Osoro, K. M., Nyolei, J. Rotich, I. C. & Odhiambo, L. (2015). Credit Reference Bureau (CRB) As a Strategic Control Measure and Its Influence on the Financial Performance of Commercial Banks in Eldoret, Kenya. *IOSR Journal of Humanities and Social Science,* 20(5), 44-64

Owino, M. O. (2013). The Effect of the Lending Policies on the Levels of Non-Performing Loans (NPLs) of Commercial Banks in Kenya. *Unpublished MSc Project.* University of Nairobi

Peria, M. S. M. & Singh, S. (2014). The Impact of Credit Information Sharing Reforms on Firm Financing. Policy Research. *Working Paper 7013.* The World Bank Group

Riungu, K. K. (2014). Effect of Credit Reference Bureaus on the Profitability of Commercial Banks in Kenya. *Unpublished MSc Project.* University of Nairobi

Rizvi, W. & Khan, M. (2015). The Impact of Inflation on Loan Default: A Study on Pakistan. Australian Journal of Business and Economic Studies, 1(1), 87-94

Robson, C. (2002). Real World Research. (2nd Ed.). Oxford, Blackwell.

Saba, I., Kouser, R. & Azeem, M. (2012). Determinants of Non-Performing Loans: Case of US Banking Sector. *The Romanian Economic Journal,* 15(44), 141 - 152

Shisia, A., Sang, W., Mutung'u, C. & Okibo, W. B. (2014). Assessment of Credit Reference Bureaus on the Management of Nonperforming Loans in the Banking Industry in Kenya: A Case of Nairobi County. *European Journal of Business and Management,* 6(23), 57-63

Skarica B. (2013). Determinants of Non-Performing Loans in Central and Eastern European Countries: *Financial Theory and Practice,* 38 (1) 37-59

Sorge, M. & Zhang, C. (2010). Information Sharing, Creditor Rights, and Corporate Debt Maturity. World Bank

Toroitich, K. K. & Omwono, G. A. (2013). The Relationship between Non-Performing Loans and Financial Performance of the Banking Sector: A Case of Equity Bank. *International Journal of Innovative Research and Advanced Studies,* 2(11), 1-10

Tumay, M. (2009). Asymmetric Information and Adverse Selection in Insurance Markets: The Problem of Moral Hazard. *Yönetim ve Ekonomi,* 16(1), 107-114

Turan, G. & Koskija, A. (2014). Nonperforming Loans in Albania. *Academic Journal of Interdisciplinary Studies,* 3(3), 491 - 500

Turner, M. A. & Varghese, R. (2010). The Economic Consequences of Consumer Credit Information Sharing: Efficiency, Inclusion, and Privacy. Background Paper No. 2. OECD Conference Centre

Turner, M. A. & Varghese, R. (2010). The Economic Consequences of Consumer Credit Information Sharing: Efficiency, Inclusion, and Privacy. The Policy & Economic Research Council.

Warue, B. J. (2013). The Effects of Bank Specific and Macroeconomic Factors on Nonperforming Loans in Commercial Banks in Kenya: A Comparative Panel Data Analysis. *Advances in Management & Applied Economics,* 3(2), 135-164

Wasseja, M. M., Oseso, O. V. & Ochieng, P. (2016). Panel Data Analysis of Credit Information Sharing and Non-Performing Loans in the Banking Sector. *Journal of Business Research & Management*, 1, 1-22

APPENDICES

Appendix I: List of Microfinance Banks in Kenya

1. Uwezo MFI Bank Ltd

2. U&I MFI Bank Ltd

3. Sumac MFI Bank Ltd

4. SMEP MFI Bank Ltd

5. REMU MFI Bank Ltd

6. Rafiki MFI Bank Ltd

7. KWFT MFI Bank Ltd

8. Faulu MFI Bank Ltd

9. Daraja MFI Bank Ltd

10. Choice MFI Bank Ltd

11. Central MFI Bank Ltd

12. Caritas MFI Bank Ltd

Appendix II: Data on NPLs and Credit Reports

Bank	Year	Total NPL(MILLIONS)	Total loans(MILLIONS)	NPL	Total annual credit reports	Ln of Pulled credit reports
MFI 1	2015	43.00	97.00	0.44	463	6.138
	2014	32.00	125.00	0.26	80	4.382
	2013	22.00	73.00	0.30	58	4.060
	2012	8.00	38.00	0.21	26	3.258
	2011	3.00	32.00	0.09	0	0.000
MFI 2	2015	326.00	1728.00	0.19	44947	10.713
	2014	251.00	1635.00	0.15	9658	9.176
	2013	219.00	1799.00	0.12	6277	8.745
	2012	274.00	1454.00	0.19	0	0.000
	2011	142.00	1445.00	0.10	0	0.000
MFI 3	2015	73.00	257.00	0.28	2764	7.924
	2014	46.00	184.00	0.25	191	5.252
	2013	33.00	161.00	0.20	124	4.820
	2012	12.00	86.00	0.14	31	3.434
	2011	3.00	41.00	0.07	0	0.000
MFI 4	2015	514.00	4270.00	0.12	12280	9.416
	2014	307.00	3418.00	0.09	11909	9.385
	2013	187.00	1866.00	0.10	1191	7.083
	2012	91.00	508.00	0.18	0	0.000
	2011	57.00	104.00	0.55	0	0.000
MFI 5	2015	2558.00	22094.00	0.12	65994	11.097
	2014	1032.00	18854.00	0.05	7064	8.863
	2013	1089.00	14530.00	0.07	5298	8.575
	2012	818.00	12873.00	0.06	1324	7.188
	2012	775.00	11200.00	0.07	0	0.000
MFI 6	2015	612.00	16584.00	0.04	68575	11.136
	2014	606.00	14488.00	0.04	10699	9.278
	2013	467.00	8725.00	0.05	8024	8.990
	2012	262.00	4949.00	0.05	6018	8.703
	2011	171.00	3238.00	0.05	0	0.000
MFI 7	2015	48.00	79.00	0.61	4092	8.317
	2014	20.00	107.00	0.19	722	6.582
	2013	16.00	82.00	0.20	216	5.375
	2012	13.00	61.00	0.21	0	0.000
	2011	9.00	54.00	0.17	0	0.000

Appendix III: CPI Data

Year	Q1	Q2	Q3	Q4	Average
2011	112.4138	119.5603	123.8809	128.8064	121.1654
2012	131.3638	133.6271	131.7755	133.3478	132.5286
2013	136.7216	139.4624	140.994	143.2454	140.1059
2014	145.9855	149.2715	151.6204	152.0929	149.7426
2015	154.4769	159.712	160.9331	163.2736	159.5989

Appendix IV: GDP Data

Year	Q1	Q2	Q3	Q4	Average
2011	5.6	7.2	6.1	1.4	5.075
2012	2.6	1.9	1.9	6.2	3.15
2013	2.5	2.6	2.2	1.1	2.1
2014	7	6.9	8.9	6.2	7.25
2015	6.3	7.5	6.1	4.5	6.1

Appendix V: Interest Rates Data

Year	Q1	Q2	Q3	Q4	Average
2011	5.88	6.25	6.63	15.17	8.4825
2012	18	18	14.75	11	15.4375
2013	9.5	8.5	8.5	8.5	8.75
2014	8.5	8.5	8.5	8.5	8.5
2015	11	11.5	8.5	10	10.25