

**EFFECT OF SHARED ENTREPRENEURS' CREDIT
INFORMATION ON THE PERFORMANCE OF
DEPOSIT TAKING MICROFINANCE INSTITUTIONS
IN KENYA**

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**Effect of Shared Entrepreneurs' Credit Information on the
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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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DEDICATION

To my wife Laura, Sons Alvin and Ayden, parents James and Rael, brothers Jediel and Laban for their encouragement and support.

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ABBREVIATIONS AND ACRONYMS

AMFI	Association of Microfinance Institutions
BDS	Business Development Services
CBK	Central Bank of Kenya
CIS	Credit Information Sharing
CRB	Credit Reference Bureau
DTMs	Deposit Taking Microfinance Institutions
KBA	Kenya Bankers Association
MFI s	Micro-Finance Institutions
MSE	Micro and Small Enterprises
MSME s	Micro, Small and Medium Enterprises.
NGO s	Non-Governmental organizations
NPL s	Non-performing loans
SACCO s	Savings and Credit Co-Operative Organizations

DEFINITION OF TERMS

Credit information	This is a collection of an individual's previous borrowing and repayment behavior (Bustelo, 2009).
Credit information sharing	This is an arrangement where lenders submit borrower information to a registered credit reference bureau from where it can be used by all lenders to make decisions (Madrid, 2009).
Credit report	This is a document generated by a credit reference bureau containing detailed information on a person's credit history, including identifying information, credit accounts and loans, bankruptcies, late payments, and recent enquiries (KBA, 2011).
Credit reference bureau	An institution that collects and collates all personal financial credit information of individual borrowers from various sources and provides such information to creditors and lenders so that they can assess their current and prospective customer's credit worthiness, the interest to charge such clients and their ability to repay such borrowed funds (Muthoni, 2014).
Deposit Taking Microfinance Institution	This is an organization in which the business up as accepts deposits on a daily basis and extends credit to micro and small businesses and low income groups using alternative collateral substitutes (Microfinance Act,2006).
Entrepreneur	This is an innovator who implements change within markets through the carrying out of new combinations (Schumpeter, 1934).
Full file reporting	This involves sharing of both positive and negative credit information (Jappelli, 2006).

Microfinance	This is a form of financial services for entrepreneurs and small businesses lacking access to banking and related services (Sadoulet, 2006)
Negative information	This is made up of defaulted loans, bounced cheques, late payments, frauds, forgeries, false declarations and statements to lenders, receiverships, bankruptcies and liquidations, tendering of false securities and misapplication of borrowed funds (KBA, 2011).
Performance	This is a measure of how well the credit market is doing (Muthoni, 2014).
Positive information	This is made up of current loans and timely payments (Hans, 2010)

ABSTRACT

When a financial institution is evaluating a request for credit, it can either collect information from the applicant first hand or source this information from other lenders who have already dealt with the applicant. Credit information sharing helps to avoid excess lending, issuing bad loans, enhancing access of funds to good loan payers and reducing non-performing loans. As at the end of September 2012 the number of credit reports requested by institutions stood at 2,036,634 in September 2012 up from 1,774,185 reports in June 2012, representing an increase of 14.8 percent or 262,449 reports. Over the same period, non-performing loans increased by 16.8 percent. The general objective of this study was to examine the effect of shared entrepreneurs' credit information on the performance of deposit taking microfinance institutions in Kenya. The study covered a period when only negative credit information was being shared. The specific objectives of this study were to determine the effect of demographic information, repayment history, current borrower's loans and character information on the performance of deposit taking microfinance institutions in Kenya. The theories that guided this study were; social exchange theory, economic entrepreneurship theory, sociological entrepreneurship theory, Hayekian theory, financial capital theory and the life-cycle theory. The study adopted both explanatory and descriptive research designs. The population of study was comprised of all 54 credit managers of the deposit taking microfinance institutions from which a census was carried out hence no sampling was done. Primary data was collected using a semi-structured questionnaire. Drop and pick method was used to administer the questionnaire. Secondary data was obtained from Central Bank of Kenya. The test for normality confirmed that data employed in analysis was normally distributed. The reliability test showed that all the study variables were reliable thus suitable for further analysis. Descriptive statistics and regression analyses were used to analyze data. Data is presented in the form of charts, tables and figures. The study established that demographic information and character information do not have a significant relationship with the performance while repayment history and current borrower's loans have a significant statistical relationship with performance of deposit taking microfinance institutions in Kenya. The study recommended the need for the government and all the stakeholders to intensify awareness campaigns about the growing need to share credit information, need to broaden the source of information by including utility companies like Kenya power, water companies, land rates collectors among others so as to enrich the available information on prospective borrowers and finally the implementation of favorable monetary policies that will result to cheap credit. This initiative will help in reducing cases of non-repayment of loans.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Credit information systems that expose a personalized credit relationship with a microfinance institution to a larger market may reduce screening costs for other lenders and improve borrowers' access to credit. Despite the potential importance of credit information systems for the alleviation of credit constraints faced by the poor, too little is known about their specific effects in microfinance markets. Even less is known about one-sided increases in the credit information available. All over the developing world, microfinance institutions have been increasingly trying to share more information about their clients' performance as a discipline device, but little is known about the consequences of such decisions. Previous developments in the theoretical and empirical literature have usually focused on the average effects of symmetric and universal increases in the information available to all lenders (Louto, 2007).

Empirical cross-country evidence suggests that information sharing is associated with broader credit markets and the alleviation of credit constraints (Jappelli and Pagano (2002), Love and Mylenko (2003) and Galindo and Miller (2001)). In addition, theoretical research on developed credit markets (Padilla and Pagano (2000) and Vercammen (1995)) suggests that exchanging detailed information on current debt or client characteristics can dilute the clarity of default as a negative signal, possibly increasing default rates. In contrast, the few theoretical (McIntosh and Wydick (2007)) and empirical studies by Luoto et al. (2007) available on microfinance markets suggest that the use of credit bureaus should reduce default rates.

Although there is a large body of theoretical work on the effects of asymmetric information in credit markets, less work has been done on the effects of information sharing between lenders. Early research by Padilla and Pagano (2000) and Vercammen (1995) on developed credit markets suggests that sharing more detailed

information on borrowers' characteristics and/or credit performance can reduce the disciplinary effects of a credit bureau. These studies argue that in an adverse selection setting, the effectiveness of default as a bad signal is reduced as banks exchange better information on their clients. When richer information is disclosed, default is no longer a stigma because the riskiness of a borrower can now be inferred from the set of additional characteristics revealed by lenders.

Some empirical studies on formal banking institutions have tried to measure the effect of information on credit constraints. Cross-country studies by Love and Mylenko (2003) show that better developed credit information systems seem to be associated with broader credit markets, a larger volume of lending and lower credit constraints.

Luoto et al. (2007) in an evaluation of the effects of the implementation of a credit bureau in the microfinance sector in Guatemala using branch-level data from a large Microfinance Institution identifies a 3.3% reduction in institutional default rates after the risk bureau was established. Empirical work that evaluates the effect of information sharing is scarce, more so for microfinance markets. Secondly, existing evidence in developed microfinance credit markets corresponds to the effects of symmetric and universal increases in information for all lenders.

1.1.1 Global Perspective of Credit Information Sharing

In general, credit information systems started as regional and specialized institutions that shared commercial information. Credit information sharing institutions in the United States, United Kingdom, Australia, Japan and Argentina emerged spontaneously and can be traced back for the last 4 decades. All these countries, except for Argentina, have a high credit depth and a high ratio of reports per capita. The group of countries that started sharing information through a public registry of credit information like Mexico, Spain, France and Italy has a significantly lower depth both in credit and reports per person (Japelli, 2010)

The United States is the country with a longest information sharing tradition. The first bureaus in the United States were Dunn, founded in 1841 and Bradstreet, founded in 1847; they started as agencies to investigate commercial creditworthiness. As the credit market developed the number of bureaus multiplied. By 1955 there were around 1700 credit bureaus in the United States, most of them regional and specialized. The US is probably the country with the most intensive use of credit information; credit bureaus provide more than 2 million reports per day. In the UK and Australia credit has considerable depth as well; both countries have a long history of private credit bureaus and the number of reports per capita is high. In the Australian case, however, the law only allows for negative information exchange (Pagano, 2002)

Cheng (2010) observes that Japan's credit and information market are also deep and its bureaus originated spontaneously several decades ago. Nevertheless, the Japanese information market is very peculiar. In the seventies three specialized information agencies were formed each of them using positive and negative information. The first agency collects information from banks; the second gathers consumers' information and the third specializes in information from commercial firms. Each generator of information provides data to only one of these agencies. Recently, these agencies started sharing their databases through a common network. There is an additional universal and national bureau, but the market is dominated by the 3 specialized agencies.

Among the countries where the bureaus had a spontaneous origin, the Argentinean case is very peculiar. Around 40 years ago, regional non-profit agencies that shared commercial information emerged. These agencies are organized around the local chambers of commerce. Currently there are more than 110 of these agencies, and besides commercial information they collect information from local banks. In addition to these regional institutions, private bureaus with national scope have existed for several decades. Despite the development of these institutions the credit and informational depth of Argentina are both relatively low (Cheng, 2010).

Turner (2008) reveals that South Africa has the most developed credit information sharing system compared with other African nations; South Africa has a highly advanced credit information system, and the capacity and skills to address any identified credit access problems. However, the country faces significant challenges in collecting data from the large, less formal economy. It has been argued that only smaller lenders willing to make costly investments in relationship banking are able to profitably extend credit to micro, small and medium enterprises. There is good reason to believe, however, that larger lenders, using rich data sources and information solutions, can profitably lend to SMMEs. Countries are also beginning to collect non-financial payment data (such as utility and telecom payments) when standard credit information is unavailable. However, such information is rarely collected in South Africa. Collecting more trade credit data from the informal sector could greatly expand access to credit for small and micro-enterprises.

Information sharing can help lenders to distinguish good borrowers from bad ones. Lenders may, however, also lose market power by sharing information with competitors. Asymmetric information in the credit market increases the frequency of information sharing between lenders significantly. Stronger competition between lenders reduces information sharing. In credit markets where lenders may fail to coordinate on sharing information, the degree of information asymmetry, rather than lender competition, drives actual information sharing behavior (Minneti, 2013).

This improved assessment of credit risk appears to translate into higher lending. Galindo and Miller (2001) find a positive relation between access to finance (debt) and an index of information sharing in the Worldscope database, using the firm-level sensitivity of investment to cash flow as a proxy of credit constraints. They find that well-performing credit reporting systems reduce the sensitivity of investment to cash flows. Love and Mylenko (2003) combine firm-level data from the World Bank Business Environment Survey with aggregate data on private and public registers collected in Miller (2003) and find that private credit bureaus are associated with lower perceived financing constraints and a higher share of bank financing. However, the existence of public credit registers does not have a significant effect on financing constraints.

In addition, the individual country studies of the IADB and World Bank projects brim with interesting evidence on the effect of information sharing on specific credit markets, highlighting particularly its disciplinary .Cabral (2001) report that in Brazil the whole postdated check market (whose size is of the same order of magnitude as the stock of household credit) operates without collateral, without personal guarantees, and without legal sanctions of any type. Its only foundation is its information-sharing mechanism: a “black list” of people issuing checks without funds. This mechanism alone also explains why the interest rate charged by factoring companies that operate in this market is much lower than that charged by credit card companies. Similar evidence is reported for Chile, where department stores seeking to collect an unpaid loan send the relevant information both to a collection agency and to the main Chilean credit bureau. Apparently, notifying the bureau was a very effective way of securing immediate repayment, since delinquent customers see their credit dry up with all the stores that they patronize.

Moreover, the degree and sophistication of information sharing arrangements appear to be synchronized with those of the financial system as a whole. The development of information sharing mechanisms appears in turn to prompt lenders to move towards more refined screening and monitoring practices. This is witnessed by the central role that information-sharing systems have taken in borrower selection in Peru, especially after the development of a public rating register in that country. As explained by Trivelli, Alvarado and Galarza (2001), this has encouraged lenders to shift away from exclusive reliance on collateral towards information-based lending.

Microfinance arose in the 1980`s as a response to doubts and research findings about state delivery of subsidized credit to poor farmers. In the 1970`s government agencies were the predominant method of providing productive credit to those with no previous access to credit facilities people who had been forced to pay high interest rates. Governments and international donors assumed that the poor required cheap credit and saw this as a way of promoting agricultural production by small landholders. In addition to providing subsidized agricultural credit, donors set up credit unions where the focus of these cooperative financial institutions was mostly

on savings mobilization in rural areas in an attempt to teach poor farmers how to save (Gehring, 2007).

Neven (2012) observes that in the beginning in the mid-1980`s, the subsidized, targeted credit model supported by many donors was the object of steady criticism, because most programs accumulated large loan losses and required frequent recapitalization to continue operating. It became more and more evident that market-based solutions were required. This led to a new approach that considered microfinance as an integral part of the overall financial system. Emphasis shifted from the rapid disbursement of subsidized loans to target populations toward the building up of local, sustainable institutions to serve the poor. At the same time, local NGOs began to look for a more long-term approach than the unsustainable income generation approaches to community development. In Asia Mohammed Yunus of Bangladesh led the way with a pilot group lending scheme for landless people. This later became the Grameen Bank, which now serves more than 2.4 million clients (94 percent of them women) and is a model for many countries. In Latin America ACCION International supported the development of solidarity group lending to urban vendors and Fundación Carvajal developed a successful credit and training system for individual micro entrepreneurs. Changes were also occurring in the formal financial sector. Bank Rakyat Indonesia, a state-owned, rural bank, moved away from providing subsidized credit and took an institutional approach that operated on market principles. In particular, Bank Rakyat Indonesia developed a transparent set of incentives for its borrowers (small farmers) and staff, rewarding on-time loan repayment and relying on voluntary savings mobilization as a source of funds (Neven, 2012).

Since the 1980s the field of microfinance has grown substantially. Donors actively support and encourage microfinance activities, focusing on MFIs that are committed to achieving substantial outreach and financial sustainability. Today the focus is on providing financial services only, whereas the 1970`s and much of the 1980`s were characterized by an integrated package of credit and training which required subsidies. Most recently, microfinance institutions have begun transforming into formal financial institutions that recognize the need to provide savings services to

their clients and to access market funding sources, rather than rely on donor funds. This recognition of the need to achieve financial sustainability has led to the current financial systems approach to microfinance. This approach is characterized by the following beliefs: Subsidized credit undermines development; poor people can pay interest rates high enough to cover transaction costs and the consequences of the imperfect information markets in which lenders operate and the goal of sustainability (Zhang, 2011).

Formal lenders usually find it too expensive to serve poor borrowers in developing countries. The lack of traditional forms of collateral and the high costs of monitoring small scale transactions translate into high interest rates that end up credit rationing the poor. Microfinance institutions (MFIs) originally emerged to tackle this problem by directly providing access to credit to poor borrowers. However, the provision of microfinance services can have the additional effect of improving borrowers' access to credit from other lenders. If the interaction of a borrower with an MFI facilitates the development of individual credit histories, other lenders can then use these records as creditworthiness signals (Craig, 2006).

1.1.2 Kenyan Perspective of Credit Information Sharing

Kenya's economic reform policies under Vision 2030 set out a clear commitment to a market economy and private sector led growth. One of the reforms for financial sector development seeks to improve stability, increase efficiency and expand credit access through the credit information sharing project. Financial institutions in Kenya have a huge potential of contributing to inclusion through increased lending, which can only be backed by the use of credit reports. This is only 4% of all credit information in the country. It is only the deposit taking microfinance institutions that are allowed to participate in credit information sharing in Kenya within the microfinance institutions. Credit information sharing was rolled out in early 2010 and banks submitted credit information to the licensed credit reference bureau in August 2010. Commendable progress has been made so far with over 2,036,634 records having been accessed by Sep 2012 (CBK, 2012).

The Central Bank of Kenya is mandated to promote the orderly growth and development of a safe and stable financial system. Towards this the Central Bank of Kenya has been licensing, regulating and supervising banks, financial institutions, mortgage finance companies and forex bureaus. With the enactment and operationalisation of the Microfinance Act, 2006 and attendant Regulations in 2008, the Central Bank was further tasked with the responsibility of licensing, regulating and supervising deposit-taking microfinance institutions (DTMs) as well. The Bank is therefore tasked to develop a vibrant, efficient, stable and sound deposit taking microfinance industry. In this regard the development of a robust microfinance sub sector geared towards bringing the unbanked majority populace into the market-based financial system has been a key objective of the Central Bank. Prior to 2006, a good number of microfinance entities existed, providing various financial services to the rural, pre-urban and low income population.

RoK (2006) notes that these MFIs were registered under different Acts of Parliament namely: the Non Governmental Organizations Co-ordination Act, the Building Societies Act, the Trustee Act, the Societies Act, the Co-operative Societies Act, the Companies Act and the Banking Act. Some of these forms of registration did not address issues regarding ownership, governance, and accountability. Lack of appropriate legislation and regulatory oversight was therefore the main impediment to their growth and development. Furthermore, their continued growth invited due attention from the Government and other players. The microfinance subsector was seen as holding great potential in serving the majority unbanked Kenyan populace. Thus, to support the microfinance industry grow, it was felt that there was need to develop an enabling legal and regulatory framework to enhance standards, discipline and efficiency in the microfinance subsector. These considerations together with others culminated into the enactment of the Microfinance Act, 2006.

The Microfinance Act, 2006 thus came into force on 2nd May 2008 after the Microfinance (Deposit- Taking Microfinance Institutions) Regulations, 2008 were formulated by the Central Bank. This was a new area for the Central Bank as it set a new dawn in the legal, regulatory and supervisory framework for the microfinance industry. The Act covers deposit-taking microfinance institutions as well as non-

deposit taking. It also provides for banks to establish fully owned subsidiaries to undertake DTM business. The implementation of the Act and the Regulations is aimed at promoting the orderly growth and development of a sound and stable microfinance industry. The operationalisation of the microfinance legislation provides a platform for the broadening and deepening of access to financial services throughout Kenya, especially to the low income populace and small and medium enterprises (SMEs) in both urban and rural areas. The Central Bank considers this legislation crucially important to the ongoing development of the financial sector (CBK, 2010).

1.1.3 Performance of Deposit Taking Microfinance Institutions

The systematic use of credit reports in assessing loan applications is one of the most remarkable developments in financial institutions. Today, many loan approvals no longer take days or weeks, but are made in minutes, thanks to information derived from credit reports. On the one hand, lender benefits from information sharing, as it helps them to select good from bad loan applicants and overcome moral hazard on the part of borrowers. On the other hand, sharing information may expose lenders to increased competition because they release private information about their existing clients (Luoto, 2007). Banks may therefore be wary of sharing information in competitive credit markets and may be particularly reluctant to share information with close competitors. Evidence suggests that the emergence of voluntary information sharing is related to information asymmetries and lender competition. From a theoretical perspective, the emergence of voluntary information sharing depends not only on the inherent degree of information asymmetries or competition in a credit market. It may also be subject to coordination failure between lenders, as for each lender the benefits of joining a credit bureau depend on the number of other bureau members. As shown by Klein (1992) lenders may fail to coordinate on sharing information, even if a private credit bureau with full membership would be the more profitable arrangement. One might think that a bankers' association or a private credit bureau company should be able to overcome coordination problems through repeated negotiations with prospective members and transparent rules for entry and exit. In studying the effectiveness of credit information sharing it was

found out that that credit reports are an important tool to assess consumer credit risk (Chandler & Parker, 1992; Barron & Staten, 2003). This is similar to the findings by Kalberg and Udell (2003), who document that trade credit history in Dun & Bradstreet's reports improves default predictions relative to financial statements alone. Also Cowan and De Gregorio (2003) found out that in Chile positive and negative information in credit reports contributes to predict defaults.

As such the Kenyan microfinance sub-sector has undergone transformation since the enactment and operationalisation of the Microfinance Act. Since 2009, the performance of the microfinance subsector has been on a growth momentum. The 6 licensed Deposit Taking Microfinance Institutions (DTMs) have experienced tremendous growth to boast of 63 branches by the end of May 2012. During this period, the gross loans and advances for the 6 DTMs stood at KSh. 17.74 billion compared to Ksh.16.5 billion registered in December 2011 thus translating to a growth of over 14.1 per cent. Similarly, the deposits base during the same period stood at Kshs. 11.64 billion representing a growth of over 7.5 per cent from Ksh. 10.2 billion in December 2011. The number of deposit accounts stood at 1.59 million while the number of loan accounts were 0.495 million (CBK, 2012)

Table 1.1: Deposit Taking Microfinance Performance Indicators

Outreach Indicator	Values as at Dec 2011	Values as at May 2012
Total number of branches	60	63
No of active deposit accounts	1.4 M	1.59 M
Value of total deposits	Ksh10.2B	Ksh 11.64 B
Number of active loan accounts	0.5M	0.5M
Value of total loan portfolio	Ksh 16.5M	Ksh 17.74B

Source (CBK, 2012)

1.2 Statement of the Problem

Credit reports help financial institutions subject customers whose credit reports indicate as having been involved in malpractices to stringent terms and conditions so as to suppress the levels of non-performing loans while increasing their loan books. In 2012, non-performing loans increased by 16.8 percent from Ksh. 53.0 billion in December 2011 to Ksh. 61.9 billion in December 2012 (CBK, 2013). In 2013, non-performing loans increased by 32.3 percent from Ksh. 61.9 billion in December 2012 to Ksh.81.9 billion in December 2013 (CBK, 2014). Theory suggests that information sharing helps in developing the credit market by raising borrowers' effort to repay loans or by avoiding excessive lending where borrowers may visit several banks and take huge loans that they do not have the ability to repay (Bennardo, 2007).

In a report by CBK (2012) as at end of September 2012 the number of credit reports requested by institutions stood at 2,036,634 in September 2012 up from 1,774,185 reports in June 2012, representing an increase of 14.8 percent or 262,449 reports. Over the same period, the number of reports requested by customers increased from 10,032 to 13,510 reports. The uptake of credit reports by financial institutions demonstrates the importance of credit information sharing initiative as one of the mechanisms meant to mitigate credit risk in the Kenyan financial sector. From the above figures, there appears to be a contrast since the amount of non-performing loans has been increasing despite the increase in the number of credit reports shared. This created a gap to determine what the true effects of credit information shared are. In Kenya, two studies related to credit information sharing have been carried out where one was on the adoption of credit information sharing among microfinance institutions in Thika (Kimondo, 2011).

This study focused on the former Thika district only and on the adoption of credit information sharing. The second study was by (Kwambai & Wandera, 2013) who carried out a related study on the effect of credit information sharing on nonperforming loans of Kenya Commercial Bank (KCB) Limited. This study looked at non-performing loans at the Kenya Commercial Bank only and disregarded the other aspects of financial institutions performance. This study therefore sought to

explore the effect of shared entrepreneurs' credit information on the performance of Deposit Taking Microfinance Institutions in Kenya so as to fill in the existing knowledge gap given that the uptake of credit reports has been rising yet the amount of non-performing loans has also been increasing (CBK, 2012).

In addition, the effect of the uptake of credit information shared is minimal given that the related local studies carried out (Wandera, 2013; Kwambai & Kimondo, 2011) were limited in terms of scope while international studies have marginally focused on the outcomes of credit information shared on microfinance institutions performance (Louto, 2007). Although there is some research work on the effects of asymmetric information in credit markets as has been shown above, less work has been done on the effects of credit information sharing between microfinance institutions. This study was therefore meant to fill this gap in specific ways by looking at the effects of shared demographic information, repayment history, borrower's current loans and character information on the performance of deposit taking microfinance institutions in Kenya.

1.3 Objectives of the Study

This study was guided by the following objectives;

1.3.1 General Objective

The general objective of this study was to explore the effect of shared entrepreneurs' credit information on the performance of deposit taking microfinance institutions in Kenya.

1.3.2 Specific Objectives

- 1) To determine the effect of demographic information on the performance of deposit taking microfinance institutions in Kenya.
- 2) To establish the effect of repayment history information on the performance of deposit taking microfinance institutions in Kenya.
- 3) To examine the effect of borrower's current loans information on the performance of deposit taking microfinance institutions in Kenya.

- 4) To explore the effect of character information of a borrower on the performance of deposit taking microfinance institutions in Kenya.
- 5) To determine the moderating effect of regulatory framework on the relationship between credit information shared and the performance of deposit taking microfinance institutions in Kenya.

1.4 Research Hypotheses

- 1) H₀₁: Demographic information has no effect on the performance of deposit taking microfinance institutions in Kenya.
- 2) H₀₂: Repayment history information has no effect on the performance of deposit taking microfinance institutions in Kenya.
- 3) H₀₃: Borrower`s current loans information has no effect on the performance of deposit taking microfinance institutions in Kenya.
- 4) H₀₄: Character information of a borrower has no effect on the performance of microfinance deposit taking institutions in Kenya.
- 5) H₀₅: Regulatory framework does not moderate the relationship between credit information shared and the performance of deposit taking microfinance institutions in Kenya.

1.5 Justification of the Study

Out of this study, the findings realized have been beneficial to various stakeholders.

1.5.1 Microfinance Institutions

The microfinance institutions and banks are now able to have a quality loan book, reduce the cost of lending and also reduce the gap of information asymmetry. More information regarding credit risk makes microfinance institutions more competitive. In addition, it has enhanced the knowledge that these institutions have regarding their customers.

1.5.2 Customers

Customers whose information is positive are able to enjoy reduced interest rates in addition to faster approval of their loan requests. In addition, the approval time for loans has been greatly reduced. There is also be a shift from collateral based lending to character based lending for those customers who have a high credit score.

1.5.3 Government

The government has been able to know about the level of adoption of credit information sharing. The government has been be able to develop a vibrant, efficient, stable and sound microfinance industry. In this regard the development of a robust microfinance sub sector geared towards bringing the unbanked majority populace into the market-based financial system in the presence of credit information.

1.5.4 Academics

The study has benefited researchers and academicians since it has added to the existing body of knowledge on credit information sharing. It has further helped research on credit risk management in the financial sector. This study has contributed to the literature by broadening the understanding of the concept of credit referencing on the performance of microfinance institutions.

1.6 Scope of the Study

This study was carried out on five licensed Deposit Taking Microfinance Institutions in Kenya which had converted into deposit taking microfinance institutions by Dec 2010. These were: Faulu Kenya DTM Limited, Kenya Women Finance Trust DTM Limited, Remu DTM Limited, UWEZO Deposit Taking Microfinance Limited and SMEP Deposit Taking Microfinance Limited which were the only microfinance institutions allowed to share credit information under the Central Bank Act and Microfinance Act in Kenya. In addition, this study covered a credit information sharing period between the year 2010 and 2013 when only negative credit information was being shared.

1.7 Limitations and delimitations of the study

In some cases some respondents had very busy working schedules and therefore they had to be given more time to complete the questionnaire. Further, regular follow-ups, reminders and use of drop and pick method of administering questionnaires were adopted so as to achieve a good response rate. Lastly, given that this study only focused on a period when only negative credit information was being shared, this study therefore does not show the effect of sharing of both positive and negative information. This limitation was addressed by proposing the need for further research that will investigate the effects of both positive and negative information on the performance of financial institutions.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a theoretical and empirical review on the study, a conceptual framework that illustrates the relationship between the independent variables; demographic information, repayment history, borrower`s current loans and character information on the dependent variable which is performance of deposit taking microfinance institutions in Kenya. Further there is a a critique of the existing literature and identification of the research gaps.

2.2 Theoretical Review

2.2.1 Social Exchange Theory

Information sharing behavior is usually assumed to be intentional and benefit oriented. According to Social Exchange Theory, people are assumed to evaluate the costs and benefits before making the decision on whether to share information with others. During the social exchange process, costs can be either opportunity costs or actual loss of resources .Examples of opportunity costs are the time and effort which could be used for other purposes. During the social exchange, the contributor may also feel a loss of unique value or information that is exchanged with others. In this case, loss of knowledge power is an example of actual loss of resources (Davenport & Prusak, 1998; Gray, 2001).

During the social exchange process, benefits can be either extrinsic or intrinsic. By sharing information with others, contributors may receive extrinsic benefits such as reciprocal benefits or a better image or reputation. They may also increase their confidence in their capability to provide useful information, which is a kind of intrinsic benefit (Constant et al., 1994; Constant et al., 1996). This theory supported the joint credit information shared aspects of the study.

2.2.2 Economic Entrepreneurial Theory

The theorists here saw an entrepreneur as an agent of economic change. They argued that changes either in the environment or organization are a transformation that can occur as a result of the reaction of some economic forces. Economists assume that entrepreneurs behave rationally towards some economic forces business opportunities and resources that result to change in environment in form of enterprise. Entrepreneurship was seen as a process or positive event to every economic revolution. Without entrepreneurs, the other factors of production such as land, labour and capital cannot transform themselves into economic value (product and services). Theorists such as Knight et al. (1978) argued that entrepreneurs play a distinct role in the market system through their evaluation of factors of production. While consumers evaluate goods in use, entrepreneurs evaluate the productivity of goods towards generating value in use. Joseph Schumpeter argues that entrepreneur is the innovator who implements change within markets through the carrying out of new combinations. The carrying out of new combinations can take several forms; the introduction of a new good or quality thereof, introduction of a new method of production, opening of a new market, conquest of a new source of supply of new materials or parts and the carrying out of the new organization of any industry.

Unlike other theories, economic theory places values on each of the factors of the production and saw them as distinct economic agents in the production process. With this distinction, the contribution of these agents was able to be demarcated and assessed individually for the avoidance of confusion.

Knight (1978) also saw entrepreneurs as agents that bear risks and uncertainty. Hayek (1948) and Kirzner (1999) as economic theorists saw competition as a motivating factor for the acquisition of entrepreneurial skill. This theory was used in determining the reward of entrepreneurship and specifically in terms of performance of deposit taking microfinance institution by looking at portfolio yield which was the indicator of the dependent variable of this study which is performance.

2.2.3 Hayekian Theory

Hayek (1937) in his theory the emphasis is on the co-ordination and dissemination of information and entails bringing into greater and greater agreement by different players of the knowledge held by different market participants, of new factual events which have occurred and which are not yet fully appreciated, by all market participants in the market for goods. The sharing of information results into better forecasting of future events and the economy is able to move closer to equilibrium as a result of this co-ordination (Hayek, 1937). The Hayekian entrepreneurial function focuses on the ability of an entrepreneur to coordinate existing knowledge, scattered over many parts of the economic system and disseminates the market knowledge thus gained to other market participants, thereby improving the co-ordination of the economy (Wood, 2005).

Hayek's entrepreneurial theory lays much emphasis on the flow of information in the market for goods and services. His concept of the entrepreneurial co-ordination of the expectations of market participants, which is necessary for progress toward equilibrium, has not been addressed by economists. As long as the market is concerned, attainment of equilibrium is a temporary situation that requires information concerning new opportunities for entrepreneurial activities. This was the main theory of this study as it helped in determining the outcomes of credit information shared by way of performance since it helps in forecasting of future events and the economy.

2.2.4 Sociological theory of entrepreneurship

According to the sociological theory one becomes an entrepreneur as a result of influence from the society. The contributors on this theory were Max Weber and Emile Durkheim. Max Weber argued that the protestant ethic is both an attitude towards personal wealth and a work ethic. Unlike traditional Catholicism that emphasized on the authority of the Church and the obligation of believers to fulfill religious duties, Protestantism placed emphasis on the individual (not the Church) and emphasizing the importance of work and that good works alone could not guarantee salvation. In Weber's interpretation of the Protestant theologies, the

Protestant proved his faith in self-discipline and his salvation through wealth. This was not wealth for the sake of wealth; it was rather the need for each person to engage in a life of continuous physical and mental labor, in which the individual would be self-directed and self-controlled. For the Protestant, each man has a "calling" which required him to do his best. By not seeking luxury, each person created a surplus or profit from his labors. This wealth should not be consumed beyond one's basic needs, but it is to be reinvested. This duty to work, use wealth wisely, depend upon one's own internal moral compass, and live a self-denying life is the "Protestant Ethic". These are values necessary for the emergence of capitalism and so entrepreneurship (Weber, 1958).

Emile Durkheim carried out studies on suicide rates between related categories like men and women, married and unmarried etc. He concluded that people committed suicide due to a weakened social structure that puts a lot of pressure on its members. Therefore the community can also push one to be an entrepreneur. The Entrepreneur is seen as a creation of the society hence supporting the character information independent variable.

2.2.5 The Life Cycle Theory

An entrepreneurial firm may be at the idea stage, the prototype stage, the rapid growth stage, or the maturity stage. A number of studies have pointed out that different types of finances are appropriate for different stages of firm development (Berger & Udell, 1998). During the earliest stages of a company funding typically comes from the entrepreneur's personal financial resources and savings or from family and friends. This is because, at this stage, the firm often lacks a viable product, customers, or stable revenues. As the firm grows and begins to generate revenues, however, angels and venture capitalists may take an interest. When the firm achieves profitability and some measure of stability, bank loans may become an option (Amidu, 2007).

Finally, when the company has achieved significant revenues and growth, it may be a candidate for sale or for an initial public offering. Thus, potential sources of capital vary in accordance with the age and size of the company (Namusonge, 2010). Unlike

large, mature companies, however, entrepreneurial firms do not consistently have a full range of debt and equity alternatives available to them.

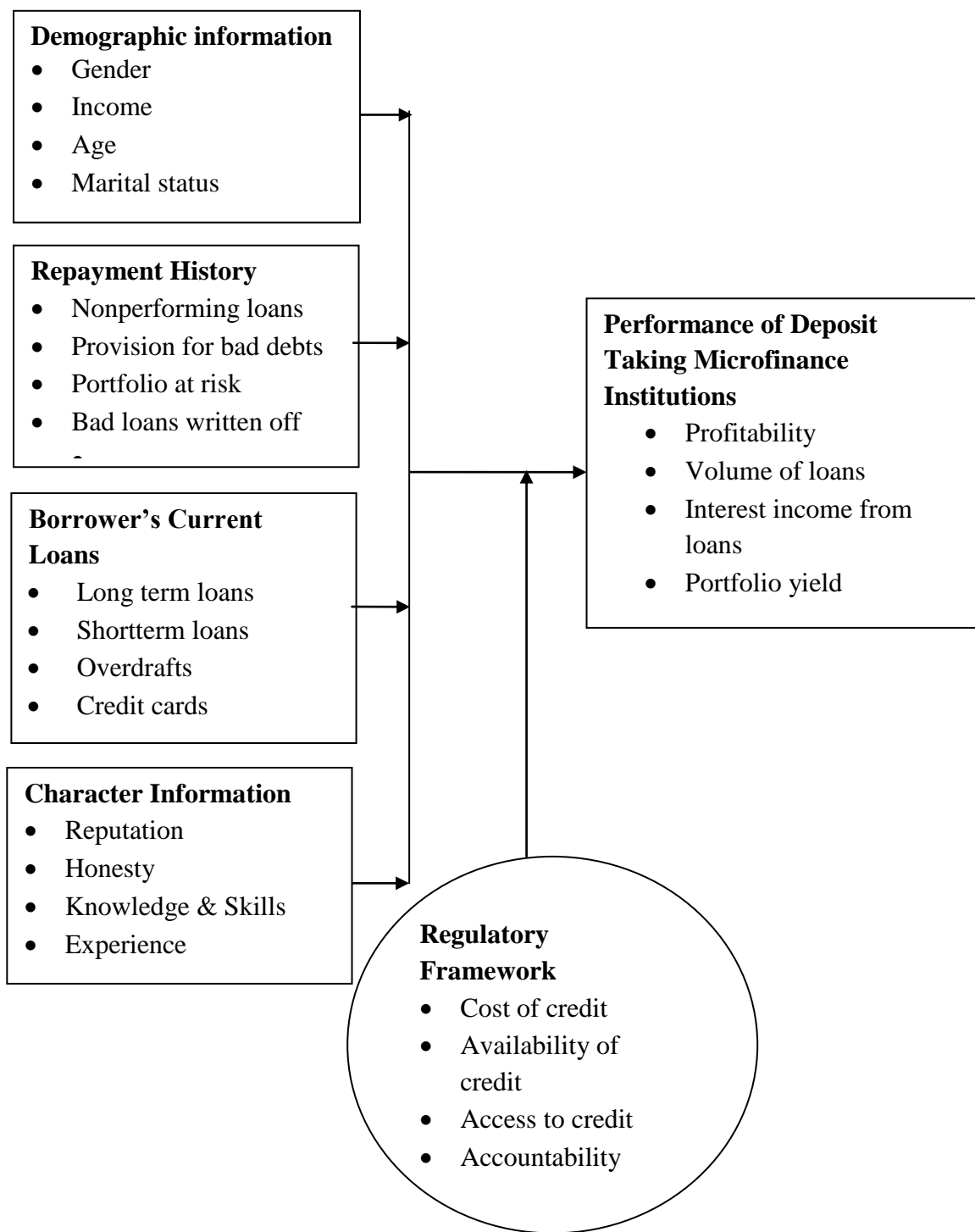
There is also a lack of separation between the finances of the firm and the firm owner. Ang (1992) discusses the lack of separation between the firm and the firm owner, or the mingling of business and personal financial resources. Oftentimes, entrepreneurs are required to provide personal guarantees or personal collateral in exchange for a bank loan. If this is the case, the limited liability protection afforded by the corporate form of organization is meaningless, since the firm owner has put his own assets and wealth at risk.

Over time, however, it becomes necessary to give away pieces of firm equity in order to raise capital from angels, venture capitalists, and eventually public shareholders. By the time all is said and done, the entrepreneur may find himself owning a very small percentage of the company (Kolari, 1994). At that stage, however, it is a much larger company, so he is ultimately better off financially with a small slice of the much larger equity pie. As noted above, entrepreneurial firms are firms that start out small and grow rapidly, often explosively. This type of growth puts tremendous strain on the management capabilities, organizational structure and finances of the firm. During its rapid growth stage, the firm consumes cash faster than it brings it in. This necessitates identifying and securing external sources of financing. Failure to do so in a timely fashion can result in slower growth or failure of the firm.

In entrepreneurial firms, working capital accounts including cash, receivables, and inventory get out of control due to missing or inadequately developed systems and controls. The inability to secure external sources of equity capital can lead to over-reliance on personally secured debt and cash shortages eventually resulting in a liquidity crisis. Problems with liquidity management are a major reason for firm failure (Coleman, 2007). This theory supported the current loans information and repayment history information independent variables.

2.3 Conceptual Framework

A conceptual framework shows the relationship between independent variables and the dependent variable (Sekaran, 2010). In this study, it showed the relationship between demographic information, repayment history, current loans and character information being the independent variables, government regulations as the moderating variable while the performance of deposit taking microfinance institutions is the dependent variable as was derived from the theories. Figure 1 shows the conceptual framework.



Independent Variables Moderating Variable Dependent Variable

Figure 2.1: Conceptual Framework

2.3.1 Demographic information of the borrower

Knowledge about client's characteristics enhances the possibility of a financial institution lending to the right borrowers. The demographics are in terms gender, income, household size, marital status, age, and employment status and business ownership. Unfortunately, in general the data needed to screen credit applications and to monitor borrowers are not freely available to banks. To the extent that a bank does not have such information, it faces adverse selection or moral hazard problems in its lending activity. Adverse selection arises when some information about the borrowers' characteristics remain hidden to the lender (hidden information), and can lead to an inefficient allocation of credit, for instance to its rationing. Moral hazard arises instead from the lender's inability to observe borrower's actions that affect the probability of repayment: for instance, about the level of effort that the borrower exerts to manage his project and avoid default on his debt (hidden action). This creates the danger of opportunistic behavior or moral hazard by the borrower. Also this type of informational disadvantage by the bank leads to an inefficient allocation of credit and possibly to credit rationing (Jappepeli, 2010).

To a certain extent, these adverse selection and moral hazard problems can be mitigated if the borrower can pledge collateral that the lender can seize in case of default, or if he has a considerable equity stake in the project or a good reputation to safeguard in the business community. In all these cases, the borrowers' incentives are well aligned with those of his creditors, and in some cases his intrinsic characteristics can be credibly communicated to lenders. But these mitigating factors are of no avail to many credit applicants, especially to young and small firms that typically lack sufficient collateral and equity capital and have a short track record (Kallber, 2003).

Another route that a financial institution can usefully follow, especially when these mitigating mechanisms are unavailable or insufficient, is to attack the problem at its root, by acquiring the information about customers that it does not possess. It can do so by spending resources to collect information about them. At the screening stage, it can visit the credit applicants' plants, talk to their managers, and study their business plans. At the monitoring stage, it can require a constant flow of information from its

borrowers, verify and analyze it, and take prompt action when there are symptoms that the project or the company is being mismanaged (Kallber, 2003).

It is often cheaper and more effective to acquire information by exchanging it with other lenders. Often borrowers apply for credit with different intermediaries during their life, and in so doing they leave a trail of information behind them. For instance, they may accumulate a record of punctuality in repayment or one of constant arrears and defaults. Their credit history may indicate that they often change residence, employment or line of business, or that they operate in a high-risk business. Finally, over time they may have accumulated a large amount of debt, possibly by borrowing relatively small amounts from a multitude of banks and credit card companies. Each individual financial institution typically has only some elements of this overall picture, and it may be able to discover the others only at a very high cost - if at all. But if all the lenders who have interacted with a specific individual or firm pool their data together, the overall picture will emerge: each lender will be able to have a much clearer idea about the credit risk implied by lending to that individual or firm (Hong, 2011).

2.3.2 Repayment History of the borrower

Borrowers' previous payments history is a powerful predictor of future payment behavior. Accessing the credit bureau's information helped lenders keep default rates very low. Non-performing loans and provision for bad loans also signal repayment behavior. Since lending to risky borrowers is a costly investment in useful quality information, lending can be reduced when such information is shared: banks that cannot offset the costs of default by low-quality borrowers by earning informational rents on future lending to high-quality borrowers require a higher probability of repayment to be willing to lend, and the credit market may collapse in situations in which it would be viable without information sharing (Sadoulet, 2006).

This suggests that communicating default data and disclosing borrowers' characteristics can have quite different effects on the probability of default. The disciplinary effect arises only from the exchange of default information. If banks also share data on borrowers' characteristics, they actually reduce the disciplinary effect

of information sharing: a high- quality borrower will not be concerned about his default being reported to outside banks if they are also told that he is a high-quality client. But, as discussed above, exchanging information about borrowers' characteristics may reduce adverse selection or temper hold-up problems in credit markets, and thereby reduce default rates (Stenbacka, 2007).

The absence of information about debtors is a major barrier for the development of credit markets. The forward looking nature of credit which involves a commitment to pay back sometime in the future the resources lent in the present makes knowledge about the identity and intentions of the debtor a crucial element for creditors. The expected behavior of the debtor regarding his probability of paying back his debts will determine the profit made by the creditor. Information on the potential borrowers and their investment projects is only partially revealed to the credit, leading to problems of moral hazard and adverse selection (Brown, 2007).

A large body of literature on credits markets shows how the existence of asymmetric information between lenders and borrowers can lead to inefficient allocation of resources or credit rationing. Since a borrower may be tempted to avoid the repayment of the loan or relax his effort during the execution of the financed project, increasing the riskiness of the loan, lenders charge higher interest rates, which leads to credit rationing (Stenbacka, 2007).

The literature on credit markets has indentified different ways in which a lender can overcome the problems derived from asymmetric information; the most notable of them is the use of collateral .However, not all loans are easily backed up with collateral. The collateralization of loans is often problematic for firms of certain characteristics such as new firms, micro-entrepreneurs, and small and medium sized enterprises –SMEs, which often lack significant fixed assets that could be presented as collateral. Collateralization is also problematic in countries with poor protection of creditor rights where the costs of seizing collateral are high, and the process takes a long time. In this context, the institutional framework regarding the legal protection of creditors is particularly relevant to access credit, especially for SMEs, which as

shown by Galindo and Micco (2007) most of the time rely on banking credit to finance their investments.

2.3.3 Current Loans of the borrower

Maintaining multiple lending relationships creates informational problems for lenders if each potential lender has no clear information about how much credit the borrower has already obtained or will be able to obtain from other lenders. A borrower's default risk, from the viewpoint of a given lender, depends on the overall indebtedness of the borrower when his obligation towards that lender will mature. Jappello (2010) indicates that if this information is unavailable to the lender, however, the borrower has the incentive to over-borrow. For instance, considering a consumer seeking credit from a credit card company and from a bank, who do not tell each other how much the consumer borrows from each. Assume that the probability of default is an increasing function of total debt. When the consumer applies for a loan from the bank, each additional dollar he borrows reduces the probability of repayment of the capital and interest to the credit card company. Thus, the consumer's expected repayment per dollar of debt is a decreasing function of his total debt and he has the incentive to over-borrow. Anticipating this moral hazard, both lenders will ration the amount of credit supplied and/or require a higher interest rate, or even deny credit unless assisted by collateral or covenants restricting total debt. This moral hazard problem disappears if the bank and the credit card company agree to reveal to each other the magnitude of the credit extended to the client. So, when lenders share information about current loans they can be expected to increase the supply of lending and/or improve the interest rates offered to credit seekers (Jappello, 2010).

2.3.4 Character Information of the Borrower

Miller (2003) shows that sharing information provides borrowers with reputation collateral, frequently viewed as more valuable than physical collateral by surveyed lenders. Furthermore, Miller argues that the types of data collected by a credit bureau often provide the best predictors of repayment.

The weakening performance of microfinance in competitive environments is due in part to the absence of information sharing in these markets. Over-indebtedness, reduced loan repayment incentives, and growing arrears for microfinance institutions (MFIs) in competitive environments (Campion, 2001; McIntosh & Wydick, 2005). Because growing numbers of MFIs increase the level of asymmetric information between lenders, credit information systems can play a crucial role towards improving credit market performance and, in turn, credit access for the poor.

The importance of information in credit markets is well established in seminal papers such as Akerlof (1970) and Stiglitz and Weiss (1981). Credit information systems act as information brokers that increase the transparency of credit markets. However, in many developing countries, credit information systems are still in their infancy and information sharing between lenders remains weak. As competition in microfinance lending intensifies in these countries, borrower information becomes all the more important. MFIs are increasingly utilizing the services of credit bureaus to address a fundamental problem of all credit markets: asymmetric information between borrowers and lenders that can lead to problems of adverse selection and moral hazard. Motivated by industry survival amidst increasing competition, a wide array of lending institutions in developing countries are becoming increasingly aware of the essential role that credit information systems play towards the creation and maintenance of an efficient financial system.

2.3.5 Regulatory Framework

The policy with respect to the assignment and distribution of borrower ratings by public credit bureaus also may potentially impact competition in a financial market. For example, if ratings are tied in a one-to-one fashion to provisioning requirements, this could discourage lenders from undertaking more detailed analysis of marginal borrowers and unduly restrict credit to this market segment. Distributing the borrower ratings back to the financial system as part of the public credit bureaus credit report may also create incentives problems. For example, if banks know that when they lower a borrower's credit rating, other institutions will be asked to follow suit. They may be reluctant to change ratings to accurately reflect a borrower's

situation. This is especially true if their exposure to the client is significant and they don't want other banks to shut off credit. Small banks may also be tempted to just follow the lead of large institutions in assigning borrowers ratings and limit or forego independent risk analysis which both detracts from competition in the market and also introduces additional risk if these smaller institutions are not performing due diligence on their own lending portfolios(Miller, 2003).

They show that adverse selection of borrowers can be contained with information sharing among banks. Padilla and Pagano (1997) also focus on reputation games driven by the borrowers' effort and welfare. The authors prove that moral hazard on the borrowers' part can be controlled by full information sharing. Jappelli and Pagano (2002) argue that full information sharing eliminates adverse selection in bank lending. Padilla and Pagano (2000) show that moral hazard in borrower-lender relationship can also be contained by information sharing. This should provide the regulators and the banks with strong incentives to share information about customers but despite serious efforts of various third parties, including the World Bank, credit reporting on borrowers is slow to appear in a large number of countries (Miller, 2003). Bouckaert and Degryse (2004) use a two-period price competition model with borrowers' switching costs to show that banks' voluntary disclosure of customer information lessens the problem of adverse selection in loan markets and softens the banks' competition for market share in the initial period.

Credit information provision finds an obvious limit in the set of legal provisions designed to protect confidential information, or individual privacy. Such provisions differ widely both within Europe and between the U.S. and European countries and these differences appear to have had profound effects on the development of credit information systems. For instance, France's strict privacy protection laws have prevented the development of private credit bureaus in that country. The degree of privacy protection accorded to prospective borrowers has historically affected credit information sharing. The activities of credit bureaus are regulated almost everywhere so as to prevent violation of privacy and civil liberties. Privacy laws effect a wide range of consumer guarantees, such as limits on access to files by potential users, compulsory elimination of individual files after a set time (e.g., 7 years in the United

States, 5 in Australia), bans on gathering certain kinds of information (race, religion, political views, etc.) and the right to access, check and correct one's own file. As far as access limits are concerned, there are three levels of privacy protection. There are low-protection countries, such as Argentina, where anyone can access all debtors' data regardless of the purpose of investigation. In medium-protection countries as the United States, data can be accessed only for an "admissible purpose", essentially the granting of credit. A higher level of privacy protection may be embodied in the further requirement of the borrower's explicit consent to access his file. This principle is enshrined in the legislation of several European countries and in the Directive 95/46 of the European Parliament on the protection of individuals with regard to the processing of personal data and on the free movement of such data. In some countries (such as France, Israel and Thailand) safeguards for consumer privacy are so strong that regulation has impeded the emergence of private credit bureaus (CIBA, 2002).

However, one should not necessarily take a negative view of the effect of privacy laws on credit information systems. Divulging certain types of information may lead people to become too cautious, that is, it may reduce risk taking and entrepreneurship below the socially desirable level. Therefore, a moderate concern for privacy may also indirectly serve economic efficiency. In addition, there is one privacy-protection rule that directly improves the accuracy of the data stored by credit information systems: entitling individuals with the right to inspect and correct mistaken information about them. Such feedback not only improves the quality of information, but also helps to correct the negative bias in reporting that credit bureaus are often blamed for. When a negative credit report is mistakenly filed, the lender will generally deny credit and therefore is unlikely to ever find out about the mistaken information, while the opposite would happen if a positive report was filed for a bad credit risk. Therefore, credit bureaus prefer to err on the negative side (Bouckaert & Degryse, 2004).

In Thailand, prior the Credit Information Business Act (2002), members of the credit information agent could supply, without the customer's consent, their customer information to the credit data center. Although such data providing transaction

speeds up the data gathering process, it violates the human rights of their customers. The emerge of the Credit Information Business Act in 2002 was the stepping stone towards consumer information security and protection, and later, in 2006 and 2008, has been modified to better define credit information business as well as stakeholders. This Act contains certain provisions that restrict personal rights and freedom wherever it is deemed appropriate to enact the law relating to credit information business.

Information sharing between firms may either increase or decrease the degree of market competition and the surplus enjoyed by consumers. Vives (1990) and Kuhn and Vives (1995) show that the effects of the production of information by an firm on the profits of its competitors and on consumer surplus are in general ambiguous, and depend on the nature of the information produced (aggregate demand, individual demand, production cost) and on the type of strategic variables chosen by competitors (price or quantity competition).

In the context of an oligopolistic market with a homogeneous product and price competition, firms may try to collude to set prices above the competitive level and thereby earn extra profits. The collusive agreement is sustained by each firm's implicit threat of competing aggressively in the future against any potential deviant. But such deviations from collusion can be punished only if detected for collusion to be sustainable, each firm must be able to observe the prices set by its competitors. Therefore, sustaining collusion requires a certain degree of price disclosure by competitors. On this basis, in recent times competition authorities have often come to regard information-sharing agreements as automatic evidence of collusive practices (Kuhn, 2001).

This contrasts with the literature that in credit markets information sharing tends to increase competition by making the information set of lenders more homogeneous and thereby reducing lenders' information rents. The main difference between the traditional standpoint and these new banking details on information sharing has to do with the type of information exchanged. In the banking details, lenders share information about the characteristics or behavior of their customers, rather than about

prices, sales and costs, as assumed by the traditional literature. Indeed, information sharing among banks has never been a concern of competition authorities: governments often mandate information sharing as a way to enhance competition in the financial sector. This does not rule out, however, that even information sharing arrangements in the financial sector may be designed to stifle competition. This can be achieved by setting up a credit bureau as a closed-membership. By refusing to admit potential entrants, incumbents erect an informational barrier to entry and therefore without access to the club's database, entrants are less informed than are incumbents (Pagano, 2005).

This is exemplified by the Mexican case, where in recent years the Mexican Bank Association formed a private credit bureau in partnership with Duns & Bradstreet and Trans-union. Two attempts to set up competing credit bureaus were unsuccessful because it proved impossible to obtain information from the banks. This happens whenever banks are vertically integrated with a monopolistic credit bureau, with which they have an exclusive relationship. This strategy allows banks to use the bureau as a collective entry prevention device against potential entrants in the credit market, illustrating a potential danger of information sharing arrangements even in credit markets.

This suggests that credit information arrangements should be open-access, so that any actual or potential lender can access the same information at non-discriminatory costs. Alternatively, public policy should foster competition among private credit bureaus. In some cases the only way to create sufficient competition is to set a very low possibly zero thresholds in public credit registers, as indeed is the case in several Latin American countries.

2.3.5 Performance of Deposit Taking Microfinance Institutions

The effects of information on market structure and market conduct may be somewhat complex, however, more information regarding credit risk is likely to make microfinance institutions more competitive and indeed as more credit information is made more publicly available, competition between banks and non-banks should also be heightened.

Given that relationships tie borrowers in to more information regarding credit risk is likely to make microfinance institutions more competitive particular lending institutions, that institution may then acquire a type of local monopoly power. However, relationship lending may still be preferable to issuing a security (non relationship lending), as the return that would have to be offered to the market (given the assumed poor information) may still be more than the price that the local monopolist bank would offer having invested in the relationship. Rajan (1992) computes an equilibrium in which firms may borrow from both banks and in the open (bond) market such that issuing in the market controls the local monopoly power of the bank. In a model that allows entry into the banking sector, if information is very poor and local monopoly rents very high, then we may expect a highly fragmented banking system with many banks, low economies of scale and a high cost of credit.

Ongena and Smith (1998) suggested that the number of bank relationships has a negative impact on the availability of credit, whereas it is ambiguous regarding its impact on interest rates. When lenders share information about the magnitude of the loans and lines of credit that they have extended to each client, then they can be expected to increase the supply of lending and/or improve the interest rate offered to credit seekers. Information sharing is also expected to increase credit access in two other ways. First, since banks can identify which of the credit seekers who have newly moved into the bank are credit- worthy, they can lend to them as safely as they do with their long - standing clients. Secondly, better information sharing can lead banks to shift from collateral - based lending to more information - based policies.

Typically, theoretical models assume some type of asymmetric information that a bank may overcome by investing (a fixed cost) in a relationship. Sharing credit information may reduce the rents available to the bank and may lead to multiple and quite subtle effects. One concern is that banks will lose the incentives to search for clients thus potentially even having a negative effect on credit availability. On the other hand, making such information available cheaply may push more credits from banks to non-banks reducing overall intermediation costs and increasing credit availability. Perhaps more realistically for the case of developing countries, forcing

banks to share some of the information may reduce the rents from private information and push the sector towards larger, less fragmented and more efficient institutions(Padallo, 2000).

The competitiveness of the credit market is also related to the competitiveness of the market in information itself .Public reference bureaus should normally co- exist with private credit bureaus. However, the private credit bureau market, in general, will have sharply increasing returns to scale, and is often dominated by a few large players especially in smaller countries where there is a very real danger of only one significant private company that will then have severely diminished incentives for responsiveness to client demands and innovation and may charge high prices. A healthy, competitive private credit bureau industry should then be free to compete on adding additional information and developing other value-added services such as credit scoring products rather than surviving on information-rents alone. The design features of public credit registries can also impact upon the role they will have in promoting competition in both financial and non-financial markets. For example, it is important to attempt to widen the access to PCR data beyond common rules regarding reciprocity for access to the data. This may impact considerably on competition in other sectors including insurance and even trade where trade credit is important (Somekalb, 2012).

2.4 Empirical Review

2.4.1 Demographic information

Hans (2010) in a study on credit information sharing and credit rationing uses a dataset drawn from the credit card center of one of the leading commercial banks in China. The Public Credit Registry in China contained both positive (the amount of current loans) and negative (delinquency history) information. The findings were that on average, the credit card line availability for the group of borrowers with external information is statistically different from that of borrowers without external information. In addition, the bank does not tend to grant lower credit lines to the group of borrowers whose external information is provided to the Public Registry only by this bank than to those without external information. This suggests that

sharing information to other banks does not decrease this bank's willingness to lend. However, the distribution of granted credit between different groups of borrowers with external information is significantly different. On average, borrowers with extra information, i.e. information shared by other financial institutions to this bank, received a higher credit card line than the group of borrowers whose external information only comes from this bank. The higher credit line offer for borrowers with extra external information stems from the fact that the bank improves its knowledge about borrower quality by shared positive information. In addition, when the extra positive information of a borrower is shared to the bank, the extra negative information is not important anymore. The researcher does not find evidence for the publicity multiplier of information as documented by Hertzberg et al. (2008) for Argentina; however, it's found that the bank lowers its credit card supply to borrowers who carry greater credit card balances at other banks. The results are in line with Bennardo et al. (2009) where multiple lending relationships induce banks to ration credit, for fear that the borrower's total exposure may become so large as to induce default; however, when banks share information about their seniority or/and about their loan sizes, lending becomes safer, and credit rationing is reduced.

It was also found out that existence of external information alters the way the bank utilizes internally produced information. For instance, it was not found out that the bank depends less on the intensity of bank-borrowing relationships, when there is external information available. Moreover, the bank's credit line supply is increased when some internally observed information is confirmed by external information, such as the housing status. In addition it was found out that external information partly mitigates informational barriers. For instance, the negative impact of balances carried by borrowers on credit availability becomes economically less significant when there is external information available. This implies that the bank may not readily distinguish the borrowers who need more credit for their future, from those who simply want to accumulate more debt. This result is in line with Callem and Mester (1995) where informational barriers lead high-balanced consumers to be rationed.

McIntosh, Sadoulet and De Janvry (2006) in a study on credit reference bureau impact on microfinance in Latin America found out that the administrative records showed that credit bureau use has a large and positive impact on loan performance. Before entry, the proportion of both individual and group loans in arrears was roughly stable, with the performance of group loans dominating that of individual loans. After credit bureau information started to be used by credit agents in selecting new clients, the average percentage of individual loans with at least one late payment decreased from 67.2% for pre-credit bureau loans to 52.8% for post-credit bureau loans. Though arrears on group loans decreased a little, the significant decrease in arrears for individual loans suggests that use of the credit bureau information led to large efficiency gains for the MFI. Furthermore, arrears on individual loans continued to decrease for approximately two years, suggesting that use of the credit bureau continues to impact loan performance. For every two months after the entry, the proportion of loans in arrears is predicted to decrease by an additional 0.9 percentage points.

Dejanvy (2008) indicates that credit bureau information was valuable to the credit agents in selecting clients and contributed to a decrease in arrears. The decrease in late payments appears to result from the MFI's ability to better select among poorer clients. Before use of the credit bureau, 63% of all loans for clients with asset values less than 1,000 quetzales ("the poor") and 54% of loans for clients with asset values greater than 1,000 quetzales ("the less-poor") had at least one late payment over the loan history. Thus, the performance of the poorer clients was substantially worse. Yet, after the MFI started using the credit bureau, 48% of loans for poorer clients and 48% of loans for the less-poor were in arrears. Similarly, before use of the credit bureau, arrears for clients with business expenditures below 1,000 quetzales were 61%; for those with expenditures above 1,000 quetzales arrears were 54%. After the MFI began using the credit bureau, these percentages fell to 52% and 46% respectively. The amount of loans given out remained the same before and after the MFI began using the credit bureau; the MFI was simply selecting and lending to different groups of people. Studies tested the robustness of the finding that the impact of the credit bureau on arrears is due entirely to selection. The majority of evidence suggests that credit bureau use had little impact on the repayment

performance of established clients those selected before use of credit bureau information. Therefore, the effect of the credit bureau on new clients likely occurs through select impact on client characteristics. It appears that the MFI used credit bureau information to replace bad, poor clients with either good, poor clients or good, less-poor clients (McIntosh, Sadoulet & De Janvry, 2006).

Cheng and Degryis (2010) in a study on information sharing and credit rationing through public credit registry affects banks' lending decisions found out that availability for the group of borrowers with external information is statistically not different from that of borrowers without external information. In addition, the bank does not tend to grant lower credit lines to the group of borrowers whose external information is provided to the Public Registry only by this bank than to those without external information. This suggests that sharing information to other banks does not decrease this bank's willingness to lend. However, the distribution of granted credit between different groups of borrowers with external information is significantly different. On average, borrowers with extra information, i.e. information shared by other financial institutions to this bank, received a higher credit card line than the group of borrowers whose external information only comes from this bank.

The higher credit line offer for borrowers with extra external information stems from the fact that the bank improves its knowledge about borrower quality by shared positive information. In addition, when the extra positive information of a borrower is shared to the bank, the extra negative information is not important anymore. He did not find evidence for the "publicity multiplier" of information as documented by Hertzberg et al. (2008) for Argentina; however, he found out that the bank lowers its credit card supply to borrowers who carry greater credit card balances at other banks.

McIntosh and Wydick (2009) in a study on understanding screening, incentive and credit expansion effects found out that credit information sharing provides a scenario that mitigates adverse selection, an incentive effect that mitigates moral hazard, and a credit expansion effect that causes higher default rates from larger loans. Indeed, these three effects can be extended in a general way to other contexts where internet technology has increased the potential for agent information-sharing among

principals in a market. Examples of this kind include automobile insurance firms pooling records across states, buyers and sellers sharing ratings information from past transactions. In each of these examples, principals first derive a screening effect by curtailing their interaction with some high-risk types. Secondly, principals benefit because awareness of the system induces some agents on the margin to improve their behavior. But more subtly, the increased confidence of principals over agent quality induces principals to extend riskier contracts to the agents passing informational screening. This trust created by the system induces an offsetting behavior which is analogous to the credit expansion effect. The positive effects will overwhelm the latter negative effect, such that the overall effect of information sharing on repayment is positive. They found that the impact of the first intervention is similar and dominant regardless of whether the screening precedes information about the system or vice versa, and hence the effect on moral hazard of the bureau may have been dominant had the incentive effect preceded the screening effect(Neven,2012).

2.4.2 Repayment History

Minnetti and Dobblas (2013) in an investigation on the consequences of lenders' information sharing using unique contract-level data from a credit bureau that serves the U.S. equipment finance industry they found evidence that lenders' information exchange has a beneficial impact on the repayment behavior of firms, reducing the incidence of delinquencies and foreclosures of loans and leases. This effect appears to be stronger for firms that are reputed to be less informational transparent such as small firms and riskier with lower credit ratings. They have also found that lenders' entry into the credit bureau reduces the size of contracts and increases the use of guarantees, suggesting that it is not necessarily that information sharing leads financiers to loosen lending standards. These findings are in line with the prediction that after lenders joins a credit bureau they become aware of the debt exposure of credit applicants and apply more stringent criteria for granting credit like extending smaller loans.

Janvry (2006) in a study on the demand and supply impacts if credit market information indicates that the strongest effect of improved information in the hands

of lenders is seen through the screening of new clients, particularly individuals, and the ability to increase loan volumes faster than would otherwise have been the case. The bureau also causes a dramatic increase in the expulsion of existing clients. On the demand side, informing group members about the implications of a credit bureau induced a better repayment performance among members of solidarity groups, both through reduction in moral hazard and improved selection by the groups themselves. This demonstrates that credit bureaus are an efficient institutional innovation not only in assisting client selection by lenders and group borrowers alike, but that additional improvements are realized when borrowers clearly understand the implications of information sharing arrangements. Borrowers with good credit records are also able to take advantage of this information sharing to get access to more loans outside Genesis. However, use of reputation to access additional loans was differentially successful across categories of borrowers. It induced the more experienced clients to improve their credit records, but not the less experienced ones who in fact worsened their records when they exuberantly seized the opportunities opened to them by information sharing across lenders to increase their levels of indebtedness with outside lenders.

With the introduction of a credit bureau allowing the sharing of positive information among lenders, the adverse selection problem could be partially resolved for the lender, especially in individual loans. Information sharing should help prevent clients from taking multiple loans and thus hiding their true indebtedness (McIntosh & Wydick, 2005). Moral hazard should also be held in check as new incentives were introduced for borrowers to improve their repayment performance that now influences access to loans across the whole participating microfinance industry (Vercammen, 1995). Information sharing should thus be a major source of efficiency gains for lenders (Jappelli & Pagano, 1999; Campion & Valenzuela, 2001). Improved performance opens new opportunities to access more and better loans from others than the lender with whom reputation had been privately earned. This public information allows good borrowers to shop for larger and cheaper loans, thus moving up the credit ladder on the basis of information about their past good behavior (Galindo & Miller, 2001). Because lender profit cannot decrease from knowing more, lenders want to join a bureau to learn what the other lender knows,

but fears suffering from the response when the other lender learns. Nothing is lost by sharing information on bad clients to whom one would never lend again, whereas sharing information on one's most profitable clients carries great risk.

Behr and Sonnekalb (2012) in a study on effect of information sharing between lenders on access to credit, cost of credit and loan performance results point to a reduction in access to credit, an increase in the cost of credit, and an improvement in loan performance as a result of the introduction of the credit registry.

In addition, the results suggest that the difference in the interest rate between loans approved after and loans approved before the improvement in information sharing, larger for SME than for micro loans. However, since this effect is only weakly significant and disappears when they control for loan characteristics. There is a statistically significant effect of improved information sharing on loan performance. The difference in the arrear probability between loans approved after and loans approved before the introduction of the credit registry is 3% points lower in the group of more affected SME borrowers. This effect is also economically meaningful as it represents approximately 35% of the overall sample average arrear occurrence of 8%. Changes in the interest rate can be a determinant of changes in loan performance because higher interest rates might induce greater risk-taking by clients or attract higher-risk clients. Overall, these results suggest that there is a loan performance improving effect through information sharing. On the contrary, there is no significant change in the probability of a loan application being approved induced by the introduction of the credit registry. It appears that the credit registry is either still too incomplete to provide the lender with meaningful information for screening purposes or the information provided only confirms the lender's internal assessments of loan applicants' credit risk. There is, however, a significant reduction of arrear probability for loans approved after the improvement in information sharing.

Research also supports the theory that information sharing reduces moral hazard. Madrid and Minetti (2009) find that if lenders enter credit information sharing institution, their borrowers improve their repayment performance delinquent payments on leases and loans decrease. Brown and Zehnder (2007) find empirical

evidence that the lending market would collapse in the absence of an information sharing institution and reputational banking. However, their study also showed that establishing a credit registry encouraged borrowers to repay their loans by allowing lenders to identify borrowers with a good payment history.

Many studies have illustrated how comprehensive information helps lenders better predict borrower default. Kallberg and Udell (2003) found that historical information collected by a credit bureau had powerful default predictive power. A study by Barron and Staten (2003) showed that lenders could significantly reduce their default rate by including more comprehensive borrower information in their default prediction models. An analogous study specific to Brazil and Argentina found similar default rate decreases when more information was available on borrowers (Powell et al., 2004).

Sharing information generates two contradictory effects over firms' access to credit. First, it makes the investigation process cheaper, which could increase access to credit. Small and medium loans are too small to justify a full fledged research process; without information sharing granting these loans may be too expensive. Assuming small and medium firms get small and medium loans, these firms would be the main beneficiaries of information sharing. The second effect of information sharing over firms' access to credit is negative: those firms that have a bad history see their access restricted. Both effects are desirable from the point of view of a healthy financial system, but from firms' perspective, if the second effect were to dominate, it would mean less access to credit (Shleifer, 2007).

2.4.3 Borrowers Current Debts

Jappelli and Pagano (2002) provide an initial empirical investigation of the existence and impacts of credit bureaus in various economies around the world. They find that the presence of credit information systems is associated with broader credit markets and lower credit risk. Nevertheless, rigorous evaluation methods on the effect of credit bureaus in developing countries is non-existent in the literature, creating a gap which this paper attempts to fill.

McIntosh and Wydick (2004) indicate that credit information systems first create a screening effect that improves risk assessment of loan applicants, thereby raising portfolio quality, which in turn reduces rates of arrears. Second, their very existence creates an incentive effect that may deter negligent borrower behavior as information about borrower behavior is shared among lenders. Some borrowers who are on the margin of misusing borrowed capital may be dissuaded from doing so if they sufficiently value future access to loans. In a competitive credit market, these efficiencies are passed on to borrowers in the form of a lower cost of capital. Improved informational flows thus enhance the efficiency and stability of the entire financial system. Yet because of the public good characteristics of credit information systems, their natural emergence in the credit market is not always guaranteed.

Consequently, the breadth, depth and general efficiency of credit information systems vary greatly between countries. Credit reporting, at some level, is a critical part of the financial system in most developed economies; in developing countries it is often much weaker if not altogether absent. This is because in a zero-information-sharing environment, repayment discipline in credit transactions typically happens via the oft-repeated transactions between a borrower and a single familiar lender in less-developed countries (LDCs). However, because borrowers often lack the ability to send signals of their creditworthiness to the entire pool of potential lenders in LDCs, they are more susceptible to borrowing terms being dictated by a solitary lender with whom they have had a past borrowing relationship. In this way informational flows between lenders can paradoxically shift market power to borrowers.

The most basic level of information-sharing between lenders involves sharing only negative information, such as borrower defaults and arrears. The simple creation of a public “black list” produces both screening and incentive effects, mitigating both adverse selection and moral hazard problems in the credit market. The existence of the blacklist helps lenders to avoid risky borrowers, and the fact that borrowers want to avoid being on the black list improves repayment incentives for borrowers who make it into the lending portfolio.

The most advanced information-sharing arrangements, however, include positive borrower data in addition to the negative data. Positive data, or a “white list”, may include the debtor’s overall loan exposure and guarantees, data from past credit history other than defaults and arrears, and debtor characteristics such as employment, income or line of business (Jappelli & Pagano, 2000). The sharing of positive information allows for the debtor to create vital “reputation collateral” often in the form of a credit score, which can provide valuable information to the credit market, and signal a borrower's individual credit worthiness to a large pool of lenders. As demonstrated in McIntosh and Wydick (2005), the sharing of positive information helps to mitigate borrower over-indebtedness, lower default rates in the overall credit market, and (in competition) to reduce equilibrium interest rates.

Bustelo (2009) in a study on integrating microfinance to credit information sharing in Bolivia found out that the new private credit bureau greatly improved lending operations particularly for MFIs. With the new bureau, lenders could verify the overall indebtedness of a customer before extending credit. The over-lending that had a crisis could be avoided. Now MFIs can perform systematic risk assessments of potential borrowers. This tool offered loan officers the opportunity to make immediate decisions, saving time and costs while improving customer service.

Borrowers’ previous payments history is a powerful predictor of future payment behavior. Accessing the credit bureau’s information helped lenders keep default rates very low. In 2008, non-performing loans represented less than 1.8% of microfinance loans’ overall portfolio. At the same time, the default rate for commercial loans was three times higher. Sharing credit information allowed microfinance lenders to grow with good customers, avoiding systematic defaulters. This kind of growth is sustainable for lenders and borrowers and it’s also significant. From 2005 to 2008, the number of individuals receiving microfinance loans more than doubled, reaching close to 2 million borrowers. That micro-lending growth spurt outpaced the 23% increase seen by regulated institutions over the same period. In the meantime, the percentage of non-performing loans for the whole banking system fell over time to just 5.7% in 2008, showing a good performance of the system. From the government’s perspective, the public registry can use the bureau’s information to

better assess the level of lending in the economy. It can also monitor with more detail the level of lending to vulnerable sectors of the economy. Non-banking institutions account for about 20% of the country's total loans, but they have close to 80% of all customers because microfinance loans are small. With such small numbers at stake, microfinance credit does not represent a significant systemic risk for the financial system, but its reach is such that any problem in this sector can have big social and political consequences (Bustelo, 2009).

Information sharing between lenders reveals borrowers' debt exposure to all participating lenders, eventually reducing aggregate indebtedness as highly indebted individuals receive less credit (Bennardo, Pagano & Piccolo, 2009). The presence of a credit registry reduces the information monopoly of a lender on its borrowers, thus reducing the extra rents that lenders can charge their clients.

Credit markets present asymmetric information problems. Lenders know neither the past behavior and the characteristics, nor the intentions of credit applicants. This creates a moral hazard problem that causes lenders to make credit decisions based on the average characteristics of borrowers rather than on individual characteristics (Chen, 2010). Moral hazard implies a lower average probability of payment, making credit more expensive. Higher interest rates exacerbate another informational problem, adverse selection, because only higher risk borrowers are willing to accept loans at high interest rates (Kipyegon, 2011). Matthews and Thompson (2008) argue that the idea underlying information sharing is that the best predictor of future behaviour is past behaviour. In practice, it is an arrangement by which lenders contribute information about their customers to a common pool, which is accessible to all lenders that contribute. This is the work of credit bureaus (Brown, Jappelli & Pagano, 2006). This creates an imbalance of power in transactions which can sometimes cause the transactions to go awry, a kind of market failure in the worst case (Yun, 2009). Consequently information asymmetry should affect the acquisition and use of bank lines since short term credit is a primary external source of firm liquidity (Faulkender & Petersen, 2006).

Evidence on the impact that credit information institutions have on over-indebtedness is less prevalent, although some evidence does exist. For instance, another finding of the study by Brown and Zehnder (2007) was that an information sharing institution helped lenders avoid serious losses from short term borrowers. The study by Madrid and Minetti (2009) demonstrated that, after establishing a credit bureau, lenders were more likely to issue smaller and shorter-term loans and to require more guarantees. This could, indirectly, provide evidence that sharing information allows lenders to see the entire indebtedness of their borrowers. In cases where this is high, it could reduce overall indebtedness.



2.4.4 Character Information

Sharing of credit-related information has the additional benefit of reducing the information monopoly a lender has on its borrowers. For example, banks with long-standing relationships with their borrowers know the credit history of those borrowers, while other lending institutions do not have access to this information. This allows the bank to charge higher interest rates and extract other rents from those high quality borrowers. On the other hand when a bank has superior knowledge about a borrower, it can charge him interest rates just slightly below those offered by an uninformed competitor and earn a rent from its information. Pooling information with other banks reduces this advantage and the implied rent, by forcing each lender to price loans more competitively. Lower interest rates increase borrowers’ net return and augment their incentive to perform (Japelli, 2010).

The exchange of information between banks reduces the informational rents that banks can extract from their clients within lending relationships. Padilla and Pagano (1997) make this point in the context of a two-period model where banks are endowed with private information about their borrowers. This informational advantage confers to banks some market power over their customers, and thereby generates a hold-up problem: anticipating that banks will charge predatory rates in the future, borrowers exert low effort to perform. This leads to high default and interest rates, and possibly to collapse of the credit market. If they commit to exchange information about borrowers’ types, however, banks restrain their own

future ability to extract informational rents. This implies that a larger portion of the total surplus generated by the financed projects will be left to entrepreneurs. As a result, these will have a greater incentive to invest effort in their project to ensure their success. This reduces the probability of default on their loans. The interest rate charged by banks will be reduced in step with the default rate, and total lending will increase relative to the regime without information sharing.

Bennardo et al. (2009) found out that where multiple lending relationships induce banks to ration credit, for fear that the borrower's total exposure may become so large as to induce default; however, when banks share information about their seniority or/and about their loan sizes, lending becomes safer, and credit rationing is reduced. Existence of external information alters the way the bank utilizes internally produced information. For instance, bank depends less on the intensity of bank-borrowing relationships, when there is external information available. Moreover, the bank's credit line supply is increased when some internally observed information is confirmed by external information, such as the housing status concerning the effectiveness of information sharing on alleviating information asymmetries in the credit market; they found that external information partly mitigates informational barriers. For instance, the negative impact of balances carried by borrowers on credit availability becomes economically less significant when there is external information available. This implies that the bank may not readily distinguish the borrowers who need more credit for their future, from those who simply want to accumulate more debt.

The impact of information sharing on aggregate credit market performance has been tested by two cross country studies. Based on their own survey of credit reporting in 43 countries, Jappelli and Pagano (2002) show that bank lending to the private sector is larger and default rates are lower in countries where information sharing is more solidly established and extensive. These cross-sectional relations persist also controlling for other economic and institutional determinants of bank lending, such as country size, GDP, growth rate, and variables capturing respect for the law and protection of creditor rights. Djankov et al. (2007) confirm that private sector credit relative to GDP is positively correlated with information sharing in their recent study

of credit market performance and institutional arrangements in 129 countries for the period 1978-2003. Firm level data suggest that information sharing may indeed have a differential impact on credit availability for different firm types. Love and Mylenko (2003) combine cross-sectional firm-level data from the 1999 World Business Environment Survey with aggregate data on private and public registries collected in Miller (2003). They find that private credit bureaus are associated with lower perceived financing constraints and a higher share of bank financing and that these correlations are particularly strong for small and young firms.

Gehrig and Stenbacka (2005) in a study on information sharing and lending market competition with switching costs and poaching found that information exchange may not promote the efficiency of credit markets at all. They found that information sharing enhances the profits of banks by relaxing price competition in the first stage when customer relationships are formed within the framework of a banking model where oligopoly rents are generated by switching costs. Information sharing magnifies industry rents, whenever they exist. Otherwise, in the absence of industry rents, information sharing neither affect overall industry profits nor entrepreneurial ex-ante investment decisions. Their analysis has implications for competition policy.

In perfectly competitive loan markets the institution of information sharing is a matter of irrelevance, and, therefore, of little concern. When banks have market power information sharing in lending markets magnifies any existing industry rents and it represents redistribution from creditworthy borrowers to banks. Thus, the welfare implications of information sharing are mixed. Whether there are social gains from information sharing depends on the relative weight society places on the revenues of talented entrepreneurs and banking profits. If for some reason the funding of good projects were sufficiently much more important for the economy than the ability to avoid credit risks the implicit transfers from talented entrepreneurs to banks would reduce welfare. Conversely, prudential supervisory concerns for the stability of the banking system may well override the potential anti-competitive concerns raised in this analysis and under such circumstances information sharing could benefit the economy. Ultimately, the relative importance of our potential anti-competitive concerns depends on the degree of market power in the specific loan

market and thus, depends on the characteristics of the lending market. Nevertheless, the higher the degree of banks' market power in the loan markets, the more urgent are potentially anti-competitive concerns associated with information sharing (Gehrig & Stenbacka, 2005).

In many countries it is common to grant credit to a borrower only after the borrower has had an account with the bank where could observe cash flow for some period of time, typically six months to a year. Alternatively, there is the group lending approach, mostly employed by microfinance institutions, which allows lenders to provide loans to individual borrowers who, via participation in the group, have developed a credit history with the institution. In these cases the credit history of a borrower, sometimes referred to as "reputational collateral", enables an individual or a firm to gain access to financing. Information and creditor rights are two determinants of what kind of credit market a financial institution is more willing to involve in. In a market where lenders could know more about borrowers, including their credit history, current debt exposure, performance, or riskiness, they do not need to concern more about the problem of financing non-viable projects, and therefore, are more willing to participate (Dong, 2009). The very survival of a bank in the market place crucially depends on its ability to collect and process information efficiently in the screening of credit applicants and in the monitoring of their performance.

In many countries lenders communicate data concerning their customers' credit-worthiness to one another or can access databases that help them assess credit applicants. However, the type and quantity of data shared by lenders, and the information-sharing mechanism, vary greatly. Often lenders agree to exchange information spontaneously, via information brokers such as credit bureaus. In other cases they are obliged to do so by the authorities via public credit registers. The empirical literature has not contributed much to our knowledge of this phenomenon and its relevance to credit market performance. The predictions of theory offer some guidance as to the impact of information sharing on default rates and lending activity. However, its predictions are partly ambiguous, and therefore it was

especially important to investigate the relation between character information shared and credit market performance.

2.4.5 Regulatory Framework

Brown et al. (2007) investigated the role of information sharing in countries with weak company law and creditor rights. They analyzed the impact of private credit bureaus and public credit registries on the availability and cost of credit to firms in 24 transition countries of Eastern Europe and the former Soviet Union. For cross sectional analysis, three indicators of firms' credit access available from the 2002 Business Environment and Enterprise Performance Survey (BEEPS) were used. These were access to finance, cost of finance and firm debt. The first two indicators were used to capture the extent to which access to loans and cost of credit constrained firm growth, while the third indicator was used to capture firms' actual use of external finance.

The study results from the cross-sectional and panel estimates showed that information sharing was associated with improved availability and lower cost of credit, particularly in transition countries with very weak legal environment. The cross - sectional estimates suggested that information sharing and firm – level accounting transparency were substitutes in enhancing credit availability: the correlation between information sharing and credit access (or the cost of credit) was stronger for opaque firms than for transparent ones. The panel estimates further suggested that the impact of information sharing on credit access and cost was stronger for small firms than large ones. Both these results were consistent with the idea that information was particularly valuable to guide banks in evaluating credit applicants who would be otherwise costly to screen, due to poor accounting information or small loan volumes. Finally, their panel estimates revealed that the relation between information sharing and credit access (cost) was stronger in countries with weak legal environments. This result confirmed the hypothesis that information sharing was particularly valuable to banks in countries where weak company and bankruptcy law increase the cost of client screening and contract enforcement.

In the UK, the guiding Act includes a notice of purpose of the data collection, the types of data that are collected, basic rights of access, as well as principles of good practice in which data have to be processed fairly and lawfully, and for only limited purposes and a limited time. The Act also provides that a data subject has the right to prevent the data controller from taking evaluation decisions concerning him or her by automated means alone (Carey, 2000; Lowe & Woodroffe, 1999). For the provisions of the Act, credit reference agencies are data controllers. This is so because they decide why and how they process personal data. A lawful credit transaction involving credit reference agencies should be construed as follows: At the time a person makes a credit application, lenders should inform and obtain the consumer's consent in order to carry out a search at credit reference agencies at the time he or she makes the credit application. As already pointed out above, such search refers to data of past transactions of the data subject. A search generates new data, the data subject should be informed and provide his/her consent about such new data being generated, processed and passed credit reference agencies, as well as the other lenders for future eventual applications, including notice as to the scope and length of time of such data processing. Once the lenders have agreed to grant a credit line, thus entering into a credit contract, they should inform and seek the consumer's consent to pass the relevant information to credit reference agencies for future (eventual) searches relating to new and different credit applications, including notice as to the scope and length of time of such data processing. . In the event a lender decides to refuse the grant of a credit line to the applicant, it should inform and seek the data subject's consent to generate and communicate such new data (i.e. the application being refused) to credit reference agencies.

Each instance of consent, as a general rule, should be the free choice of the individual. It could be suggested finally that the above notices and consents should be separate from the notice and consent which a customer gives for the processing of his/her data for the specific purposes of the credit relationship with the lender at stake. Such separate notice, in addition, should already contain the specific name and address of the credit reference agencies which will become data controller, as well as the third parties to whom the data will be disclosed which, in turn, will eventually also become data controllers. By contrast, according to current practice, it is the data

subject who has the burden to make a written request to the lender asking for the name and address of any credit reference agencies to which the lender applied for information as to his/her financial standing at any antecedent time (Lowe & Woodroffe, 1999). The issue concerning the right of an individual to access personal data in relation to the name and address of all third parties that have had, or will have, access to such information through credit reference agencies, however, proves certainly more difficult and not supported by practice. It seems the case, however, that consumers do not have much choice if they do not want to be refused credit. The consumer's consent with regard to the searches to be carried out in the credit reference agencies databases, in fact, seems to be viewed both mandatory and assumed (i.e. implied consent). Lenders say that the lack of such consent would impede them from taking the credit application any further. No consent, no credit (i.e. enforced consent). Moreover, lenders make it a condition of the credit contract that at a later stage they have the right to pass the information concerning such specific credit line to credit reference agencies, which in turn have the right to disseminate the same to their client members, such clause seeming to be not negotiable (no consent, no contract). The third and fourth laws, as it has been pointed out above, lenders not only subscribe as client members to credit reference agencies for the use of the information of the databases but also contribute information to them. This is where questions of potential breaches of bank secrecy/confidentiality may arise.

It was accepted for some time through banking practice that lenders reveal black information to credit reference agencies. By contrast, banks have stated in the banking code of practice that no white information would be passed to credit reference agencies without the consent of the customer (Banking Code of Practice, 2005). However, whether there is a legal justification for such practices (concerning both "black" and "white" credit data) is problematic. In fact, nothing is said in the Banking Code of Practice about its legal status and there is no suggestion that it confers legal rights on customers, although it purports to impose liabilities on them. As it is expressly stated that it is "voluntary" it may well be suggested that it has no legal effect at all (but, as subscribing banks advertise that they adhere to it and make it available to customers, its provisions may not be treated as implied terms in the

banking contract) (Ellinger et al., 2002). In addition, there is no statutory law relating to the bankers' duty of secrecy and the rules as set by precedents and terms implied in the contract between a bank and a customer. The duty of confidence by banks raises difficult questions and complex legal issues which are beyond the scope of this paper. The leading case is *Tournier v. National Provincial and Union Bank of England*, in which it was established that the bank owed its customer a legal, and not merely a moral, duty of confidentiality and could not lawfully disclose to third parties information concerning the customer's affairs. This duty is not absolute but it is qualified by four exceptions, namely: (1) where disclosure is under compulsion by law; (2) where there is a duty to the public to disclose; (3) where the interests of the bank require disclosure; and (4) where disclosure is made by the express or implied consent of the customer.

Legal scholars mainly assume that banks have been relying on either exception (3) the interest of the bank; or exception (4) consent of the customer; but it is arguable that banks have no entitlement to divulge customers' credit information under the common law and that the safest and proper course of action would be to ensure that they have the consent of the customer, either express or implied (Wadsley & Penn, 2000; Campbell, 1999, p. 93). To this purpose, moreover, it is worth going back a little in history to look at the 1998 "Jack report on banking service: law and practice" that looked at many aspects of the banker-customer relationship. It should be stressed from the outset that the Jack Report was never implemented, but its findings are nonetheless interesting. The recommendation in relation to credit reference agencies and the possible disclosure of confidential information by banks was made that the extent of permitted disclosure "in the interest of the bank" without customer consent should be clearly limited by statute, and that in any event exception (3) should not really be used other than in the narrowest of situations (Turner, 2000). Therefore, this would leave a bank disclosing a customer's information having to obtain consent from him or her or be able to imply it.

Japelli (2005) argues that the memory of the system is another regulation issue. The number of years a credit information system remembers default or arrears by a given borrower is another important parameter in the design of a credit information system.

At one extreme, a system with infinite memory, where borrowers have no chance to exit from the black list even after late repayment, may create a high incentive to repay on time, but may later deter the decision to take any debt. The risk of being eternally black listed in case of default may be so large as to deter from borrowing even individuals with relatively solid prospects. A black list with extremely long memory may prevent defaulted debtors from ever making a comeback. Upon default, entrepreneurs may never have a chance to get new loans and start a new business and therefore to repay their past debts. Furthermore, even if a borrower has the money to repay a defaulted loan, he may have little incentive to do so because in any event his reputation is permanently marred. In this sense, a black list with very long memory can contribute to the well-known problem of debt overhang, by which defaulted debt becomes a permanent obstacle to the resumption of subsequent economic activity. At the other extreme, a system where records are kept for a very short time and immediately erased upon late repayment would exert very little discipline on borrowers and correspondingly provide very little information on their track record to lenders.

The desirable degree of memory and forgiveness of the system lies between these two extremes. The system should trade off the need to discipline borrowers and the need to give them a second chance. The optimal degree of forgiveness depends on many features of reality, including for example the persistence of default-inducing shocks, and generally differs from country to country. Where creditor rights are less well protected, for instance because of poor judicial enforcement, the need to discipline borrowers may be more pressing than elsewhere, and therefore one may want to make the memory of the system longer and less forgiving (Jappeli, 2005).

In South Africa at Belgian Central Office for Credit to Private Individuals, a bureau that records only default information concerning household debt. Borrowers who redeem their debt disappear more quickly from the register than borrowers for whom a repayment commitment continues to exist. If arrears are repaid then the information is automatically removed after one year; if the debt is repaid after default, it is removed only after 2 years. Irrespective of the type and status of the obligation, the database does not keep any record for more than 10 years. So punishment is stricter

for more serious misconduct (defaults are punished more than arrears), but eventually there is forgiveness for everybody (Japelli, 2005)

Pagano (2005) further indicate that apart from its role in the design of a credit information sharing mechanism, this parameter is also a public policy variable, insofar as policy-makers may limit the memory of private credit bureaus by regulation. For instance, Danish credit bureaus are entitled to register and distribute at most 5 years of data that is relevant to assess the financial situation of businesses or individuals; the 1970 U.S. Fair Credit Reporting Act, as amended in 1996, prohibits dissemination of adverse information (such as bankruptcy) after more than 7 years.

In Kenya, the banking sector had for a long time engaged the Central Bank of Kenya (CBK) in discussions aimed at introducing a Credit Information Sharing (CIS) framework. This was first triggered in the 1990s by the realization that non performing loans (NPLs) were soaring, and the economy was affected by low levels of growth in private sector lending. In addition, good borrowers were disadvantaged by high interest rates and stringent collateral requirements that they had to bear as banks cushioned themselves against the risk of high nonperforming assets. Banks, on their part, were not able to reward good borrowers with better lending terms, because risk assessment was hampered by information asymmetry. Following various discussions on the most appropriate approach, the Banking Act was amended in 2003, and again in 2006, while the Banking (Credit Reference Bureau) Regulations, 2008 were published in July 2008. In 2007, the Kenya Bankers Association (KBA) and CBK established a Joint Task Force in order to fast-track a Credit Information Sharing mechanism for Kenya. Thereafter, with funding support from Financial Sector Deepening (Kenya), Kenya Credit Information Sharing Initiative (KCISI) was established in August 2009 within KBA to implement this process. Since then, a number of milestones have been accomplished, namely: Data specifications were developed in November 2009 and released to licensed institutions in January 2010.

In Kenya, the Banking Act and the CRB Regulations provide for CIS among licensed institutions through licensed CRBs. The regulations prohibit the establishment or

operation of a CRB for the banking sector, without a license. Sharing of nonperforming loan data is compulsory, while sharing of information on performing loans is voluntary.

The regulations demand accuracy of the CRB database. CRBs are required to ensure that consumer information is current, authentic, legitimate, reliable, accurate, truthful and also that it reflects the existing situation of the customer. The current system only allows for sharing of information within a closed user group, which is restricted to licensed banking sector institutions. CRBs may however obtain information from various sources including outside the banking sector. Other important rights and obligations are covered in the regulations.

A Consumer has the right to: Know information submitted to a bureau, access credit reports kept in the database of a bureau, receive a free copy of a credit report annually or upon receipt of an adverse action notice from a licensed institution, dispute information held by a bureau, Investigations on disputed information and correction or amendment of information upon conclusion of an investigation (if in his or her favor) lodge a dispute with a bureau, the CRB reports this investigation to the institution that provided this information and the institution has 15 days to get back to the CRB with the correct information, failing which the bureau is required to strike off the disputed information from the consumer's record (C.B.K, 2011).

Credit providers have a responsibility to: provide information to all licensed CRBs, notify clients of the bureau to which they have submitted their information, issue an adverse action notice to the consumer where an adverse decision has been taken based on information obtained from a CRB, provide accurate information to CRBs, submit and update customer information to the CRB in accordance with the Regulations; and instruct CRBs to delete incorrect information and replace it with correct information(C.B.K, 2011).

2.4.6 Performance of Deposit Taking Microfinance Institutions

The effect of information sharing on lending institutions is positive because of the lower default risk. However, this position effect may be accompanied by increasing competition from other lenders (Padilla & Jappelli, 1997). Stiff competition may have a desirable effect for lenders, in addition to enhanced discipline on borrowers. Padilla and Pagano (1997) indicate that credit information sharing could provide good incentives to borrowers precisely because it creates more competition among lenders given that competition dissipates informational rents, borrowers perform better because they perceive that the lender is not appropriating all the benefits of their effort to repay their loans.

Another positive outcome of sharing information is the reduced costs of credit research. This makes profitable some loans that were not worthwhile before information was shared. We would expect that loans to small and medium firms and consumers experience more benefits than loans to larger firms. The latter have other mechanisms to transmit information, like the stock market; additionally, the size of loans that these firms would require justifies spending more resources on investigating. The positive effect on small and medium size loans makes the development of an effective information sharing mechanism even more relevant for a country like Mexico, where small firms are prevalent.

In terms of the willingness of lenders to share information, Pagano and Jappelli (1993) find that sharing is more likely, the larger the population, the greater the level of mobility and the more heterogeneous individuals are. Klein (1992) states that credit bureaus in “the Great Society” play the role of gossip in smaller communities; hence, information sharing mechanisms only emerge in large enough societies.

A related aspect that affects the sharing decision is provided by Jappelli (1997) and Padilla and Jappelli (1997). They claim that when there is less competition among lenders, information sharing is more feasible. Their models assume that debtors with good credit histories do not have a reliable method to transmit that information to other credit grantors, except through the credit bureau. They also assume that the sharing mechanism gathers both positive and negative information. Under these

conditions, the lack of an institution to share information allows lenders to make extraordinary profits even if they face competition from other lenders; that is, lenders get an informational rent from charging high interest rates to those clients they have identified as low risk. The lack of information sharing inhibits lenders' competition for good clients. Consequently, banks may not be willing to participate in the bureau, because sharing information about their good clients will greatly reduce the banks' informational rents from these clients. On the other hand, when there is less competition between lenders before the sharing mechanism is established, due to collusion or regulation, lenders may be willing to participate because it does not represent a threat to their informational rents.

Luoto et al. (2007) provides empirical evidence in a study on the effects of the implementation of a credit bureau in the microfinance sector in Guatemala. Using branch-level data from a large MFI, they identify a 3.3% reduction in institutional default rates after the risk bureau was established. These studies argue that, in an adverse selection setting, the effectiveness of default as a bad signal is reduced as banks exchange better information on their clients. When richer information is disclosed, default is no longer a stigma because the riskiness of a borrower can now be inferred from the set of additional characteristics revealed by lenders.

A growing body of empirical evidence supports the hypothesis that information sharing enhances credit market performance. Analyses of credit bureau data confirm that credit reporting reduces the selection costs of lenders by allowing them to more accurately predict individual loan defaults (McIntosh & Wydick, 2007). Experimental evidence by Brown and Zehnder (2007) shows that a public credit registry can motivate borrowers to repay loans, when they would otherwise default.

The effect of information sharing on total credit market performance has been tested by two cross-country studies. Based on their own survey of credit reporting in 43 countries, Jappelli and Pagano (2002) show that bank lending to the private sector is larger and default rates are lower in countries where information sharing is more solidly established and extensive. These cross-sectional relations persist also controlling for other economic and institutional determinants of bank lending, such

as country size, GDP, growth rate, and variables capturing respect for the law and protection of creditor rights. Djankov et al. (2007) confirm that private sector credit relative to GDP is positively correlated with information sharing in their recent study of credit market performance and institutional arrangements in 129 countries for the period 1978-2003.

Firm-level data suggest that information sharing may indeed have a differential impact on credit availability for different firm types. Love and Mylenko (2003) combine cross-sectional firm-level data from the 1999 World Business Environment Survey with aggregate data on private and public registries collected in Miller (2003). They find that private credit bureaus are associated with lower perceived financing constraints and a higher share of bank financing (while public credit registries are not), and that these correlations are particularly strong for small and young firms. Cross sectional analysis provides additional evidence on the differential impact of information sharing by firm type. In particular in line with the above discussion, information sharing benefits opaque firms more than transparent ones. But their main contribution was to investigate whether these cross-sectional findings are confirmed when the estimation is carried out on firm-level panel-data. Cross-sectional estimates, such as those by Love and Mylenko (2003), cannot disentangle the effect of information sharing from that of unobserved firm-level characteristics and of other country level institutional factors.

Several studies have shown how detailed information helps lenders better predict borrower default. Kallberg and Udell (2003) found that historical information collected by a credit bureau had powerful default predictive power. A study by Barron and Staten (2003) showed that lenders could greatly reduce their default rate by including more comprehensive borrower information in their default prediction models. A study in Brazil and Argentina found similar default rate decreases when more information was available on borrowers (Powell et al., 2004). Information sharing between lenders reveals borrowers' debt exposure to all participating lenders, eventually reducing aggregate indebtedness as highly indebted individuals receive less credit (Bennardo, Pagano & Piccolo 2009).

Although theory is ambiguous on the impact that information sharing will have on the credit market, empirical evidence has provided plenty of evidence supporting the claim that credit sharing institutions have a positive effect on lending to the private sector. For instance, Jappelli and Pagano (2002) show that strong credit-sharing institutions are positively related to the size of the credit market. Other empirical studies, including Jappelli and Pagano (1993), Love and Mylenko (2003), Galindo and Miller (2001) and Powell et al., (2004) have shown that credit is more abundant when borrowers and lenders benefit from credit-sharing institutions. Brown, Jappelli and Pagano (2006) find that credit sharing between lenders is associated with increased and cheaper credit in transition countries in Eastern Europe. Djankov, McLiesh and Shleifer (2007) show that such institutions are associated with higher ratios of private credit to gross domestic product. Berger, Frame and Miller (2005) demonstrate how such institutions increased the quantity of small business loans in the United States, and, more importantly, served to expand credit to riskier marginal borrowers represent firms that, in the absence of credit information sharing institutions would probably not receive credit.

Findings also support the theory that information sharing reduces moral hazard. Madrid and Minetti (2009) find that if lenders enter a credit information sharing institution, their borrowers improve their repayment performance delinquent payments on leases and loans decrease. Brown and Zehnder (2007) find empirical evidence that the lending market would collapse in the absence of an information sharing institution and reputational banking. However, their study also showed that establishing a credit registry encouraged borrowers to repay their loans by allowing lenders to identify borrowers with a good payment history. The presence of a credit information sharing reduces the information monopoly of a lender on its borrowers, thus reducing the extra rents that lenders can charge their clients.

Evidence on the impact that credit information institutions have on over-indebtedness is less prevalent, although some evidence does exist. For instance, another finding of the study by Brown and Zehnder (2007) was that an information sharing institution helped lenders avoid serious losses from short term borrowers. The study by Doblas-Madrid and Minetti (2009) demonstrated that, after establishing

a credit bureau, lenders were more likely to issue smaller and shorter-term loans and to require more guarantees. This could, indirectly, provide evidence that sharing information allows lenders to see the entire indebtedness of their borrowers. In cases where this is high, it could reduce overall indebtedness.

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2.5 Critique of Existing Literature

Minnetti and Dobblas (2013) in an investigation on the consequences of lenders' information sharing using unique contract-level data from a credit bureau that serves the U.S. equipment finance industry they found evidence that lenders' information exchange has a beneficial impact on the repayment behavior of firms, reducing the incidence of delinquencies and foreclosures of loans and leases. This study would yield better results if they sought information from financial institutions in addition to data from a credit bureau.

Behr and Sonnekalb (2012) in a study on effect of information sharing between lenders on access to credit, cost of credit and loan performance , results point to a reduction in access to credit, an increase in the cost of credit and an improvement in loan performance as a result of the introduction of the credit registry. The researchers did a case study of a large microfinance institution in Albania. Given the limited scope, the results of the study cannot be generalized hence a larger population would provide better results.

Bustelo (2009) in a study on integrating microfinance to credit information sharing in Bolivia found out that the new private credit bureau greatly improved lending operations particularly for MFIs. With the new bureau, lenders could verify the overall indebtedness of a customer before extending credit. The over-lending that had a crisis could be avoided. Now MFIs can perform systematic risk assessments of potential borrowers. The study focused only on private bureaus and disregarded public bureaus hence the findings did not reveal the true picture of credit information sharing in Bolivia.

Cheng and Degry (2010) used dataset containing detailed information on credit card applications and decisions from one of the leading banks in China in a study on

information sharing and credit rationing through public credit registry affects banks' lending decisions. They found out that availability for the group of borrowers with external information is statistically not different from that of borrowers without external information. In addition, the bank does not tend to grant lower credit lines to the group of borrowers whose external information is provided to the public registry only by this bank than to those without external information. Although this study focused on a unique case, the fact that it narrowed down on one product (credit cards), limits the application of these findings to financial institutions offering multiple products.

The impact of information sharing on aggregate credit market performance has been tested by two cross-country studies. Based on their own survey of credit reporting in 43 countries, Jappelli and Pagano (2002) show that bank lending to the private sector is larger and default rates are lower in countries where information sharing is more solidly established and extensive. These cross-sectional relations persist also controlling for other economic and institutional determinants of bank lending, such as country size, GDP, growth rate, and variables capturing respect for the law and protection of creditor rights. This study was quite comprehensive given that it took into consideration many countries with a lot of diversity. Their findings are generalisable and have informed research in many countries and institutions.

Love and Mylenko (2003) combined cross-sectional firm-level data from the 1999 World Business Environment Survey with aggregate data on private and public registries collected in Miller (2003). They find that private credit bureaus are associated with lower perceived financing constraints and a higher share of bank financing (while public credit registries are not), and that these correlations are particularly strong for small and young firms. This study is relatively comprehensive compared to studies that have only focused on either public bureaus or private bureaus this study has focused on both.

Luoto et al. (2007) provides empirical evidence in a study on the effects of the implementation of a credit bureau in the microfinance sector in Guatemala. Using branch-level data from a large MFI. Given the limited scope, the results of the study

cannot be generalized beyond the MFI since it was a case study. A wider population would have provided more generalisable results better results.

McIntosh, Sadoulet and de Janvry (2006) in a study on credit reference bureau impact on microfinance in Latin America used the data gathered before and after the introduction of a credit bureau. This is key in impact related studies. They found out that the administrative records showed that credit bureau use has a large and positive impact on loan performance. Before entry, the proportion of both individual and group loans in arrears was roughly stable, with the performance of group loans dominating that of individual loans. After credit bureau information started to be used by credit agents in selecting new clients, the average percentage of individual loans with at least one late payment decreased from 67.2% for pre-credit bureau loans to 52.8% for post-credit bureau loans.

In Kenya, two studies related to credit information sharing have been carried out where one is on the adoption of credit information sharing among microfinance institutions in Thika (Kimondo, 2011). This study was limited in terms of scope given that it concentrated on Thika alone. More inclusive results would have been gained if the study considered other regions in the country.

Kwambai and Wandera (2013) carried out a related study on the effects of credit information sharing on nonperforming loans in Kenya Commercial Bank Limited. This study only considers nonperforming loans disregarding other measures of performance like portfolio at risk, interest rates, volume of loans and cost of lending per borrower.

2.6 Research Gaps

Empirical work that evaluates the effect of information sharing especially on microfinance markets is lacking. In addition, due to the lack of borrower-level data, most previous studies only measure average effects, ignoring differential effects on borrowers who are heterogeneous in terms of their past and/or current credit histories.

Some empirical studies on formal banking institutions have tried to measure the effect of information on credit constraints. Cross-country studies by Jappelli and Pagano (2002), Love and Mylenko (2003), Zhang (2011) examined the role of information sharing in trade credit allocation using a sample of publicly traded firms in Thailand. Brown, Chapelli and Paggallo (2008) carried out a study on whether sharing credit information among banks has affected credit performance in the transition countries and Eastern Europe. From the above it is evident that most studies have been carried out in other continents and few in Africa

In Kenya, Kimondo (2011) carried out a study on the adoption of credit information sharing among microfinance institutions in Thika. The uptake of credit reports by financial institutions demonstrates the importance of credit information sharing initiative as one of the mechanisms that will go a long way in mitigating credit risk in the Kenyan banking sector. This study was limited in terms of scope given that it concentrated on Thika alone. More inclusive results would have been gained if the study considered other regions in the country.

In a study by Kwambai and Wandera (2013) on the effects of credit information sharing on nonperforming loans of Kenya Commercial Bank Limited. The study focused on the trend of bad loans before and after the introduction of credit information bureaus, factors that account for bad loans, economic sector that records higher bad loans and the efforts taken to reduce the risk in this sector in KCB. This study only considers nonperforming loans disregarding other measures of performance like portfolio at risk, interest rates, volume of loans and cost of lending per borrower.

Although there is some research work on the effects of asymmetric information in credit markets as has been shown above, less work has been done on the effects of information sharing between lenders and particularly among deposit taking microfinance institutions. This study was therefore meant to fill this gap in specific ways by looking at the effects of shared demographic information, repayment history, borrower`s current loans and character information on the performance of deposit taking microfinance institutions in Kenya.

2.7 Summary of Literature Review

Cross country evidence suggests that information sharing is associated with broader credit markets and the alleviation of credit constraints (Jappelli & Pagano, 2002), Love and Mylenko (2003), and Galindo and Miller (2001). In addition, theoretical research on developed credit markets by Padilla and Pagano (2000) and Vercammen (1995) suggests that exchanging detailed information on current debt or client characteristics can dilute the clarity of default as a negative signal, possibly increasing default rates. In contrast, the few theoretical (McIntosh & Wydick, 2007) and empirical studies (Luoto et al., 2007) available on microfinance markets suggest that the use of credit bureaus should reduce default rates.

Although there is a large body of theoretical work on the effects of asymmetric information in credit markets, less work has been done on the effects of information sharing between lenders. Early research by Padilla and Pagano (2000) and Vercammen (1995) on developed credit markets suggests that sharing more detailed information on borrowers' characteristics and/or credit performance can reduce the disciplinary effects of a credit bureau. These studies argue that, in an adverse selection setting, the effectiveness of default as a bad signal is reduced as banks exchange better information on their clients. When richer information is disclosed, default is no longer a stigma because the riskiness of a borrower can now be inferred from the set of additional characteristics revealed by lenders. In other words, conditional on the additional characteristics revealed, default becomes a weaker predictor of the borrowers' type and future performance.

Some empirical studies on formal banking institutions have tried to measure the effect of information on credit constraints. Cross-country studies by Jappelli and Pagano (2002), Love and Mylenko (2003), and Galindo and Miller (2001), show that better developed credit information systems seem to be associated with broader credit markets, a larger volume of lending and lower credit constraints.

Among the few contributions on microfinance markets, McIntosh and Wydick (2007) developed some seminal contributions. In a model that predicts that when all lenders exchange borrowers' records on default (negative records) and current debt

(positive records), there is an overall reduction in default rates compared to the scenario where only negative records are shared. The authors argue that sharing positive information in addition to borrowers' negative records yields three effects: a screening effect, an incentive effect, and a credit expansion effect. The first two effects tend to reduce default rates through lenders' increased ability to screen multiple borrowers and reductions in the share of borrowers who engage in multiple loan contracts, respectively. In contrast, the credit expansion effect improves access to credit for clean and defaulting borrowers which in turn increases the probability of default, but without overwhelming the first two effects.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction.

This section comprises of the research design, population, sampling and sample size, data collection methods, pilot testing, data analysis and a description of how the results were resented.

3.2 Research design.

Research design is the approach adopted in the study to answer the research questions (Sekaran, 2010). This study adopted both the explanatory and descriptive research designs. Explanatory research design establishes causal relationships between variables. The emphasis is on studying a situation or a problem in order to explain the relationship between variables (Saunders, Lewis & Thornhill, 2007). In this case it involved gathering of data to determine the effect of credit information shared on the performance of deposit taking microfinance institutions in Kenya. Descriptive research involves describing the present status of a phenomenon, determining the nature of the prevailing conditions, practices, attitudes and seeking accurate descriptions (Kombo & Trump, 2006). In this study, it was used to describe the characteristics of the DTMs, customers and the microfinance sector. These designs were used in similar studies by Behr and Sonnelkalb, 2012 in a study in Albania on effects of Credit Information Sharing between lenders on access to credit, cost of credit and loan performance and Dejanvry et al. (2010) in a study in Guatemala on the supply and demand side impacts of credit market information. In addition, the designs were used by Muthoni (2014) in a study on Credit information sharing, bank characteristics and credit market performance in Kenya

In addition the study adopted the positivism philosophy. A research philosophy is a belief about the way in which data about a phenomenon should be gathered, analyzed and used. The term epistemology which means what is known to be true as opposed to doxology which means what is believed to be true encompasses the various

philosophies of research approach. Two major research philosophies identified are positivist sometimes called scientific and interpretive also known as anti-positivist (Galliers, 1991).

Positivists believe that reality is stable and can be observed and described from an objective viewpoint without interfering with the phenomena being studied (Levin, 1988). They contend that phenomena should be isolated and that observations should be repeatable. This often involves manipulation of reality with variations in only a single independent variable so as to identify regularities in and to form relationships between, some of the constituent elements of the social world. Predictions can be made on the basis of the previously observed and explained realities and their inter-relationships. Positivism has a long and rich historical tradition. It is so embedded in our society that knowledge claims not grounded in positivist thought are simply dismissed as a scientific and therefore invalid (Levin, 1988).

Interpretivism contends that only through the subjective interpretation of and intervention in reality can that reality be fully understood. The study of phenomena in their natural environment is key to the interpretivist philosophy, together with the acknowledgement that scientists cannot avoid affecting those phenomena they study. They admit that there may be many interpretations of reality, but maintain that these interpretations are in themselves a part of the scientific knowledge they are pursuing. This study will adopt positivism approach because it allows for objective research given that there can be manipulation of reality with variations in only independent variables so as to identify changes in the dependent variable (Galliers, 1991)

3.3 Target Population

These are the entire individuals to be studied (Kombo, 2006). Mugenda and Mugenda (2003) define population as an entire group of individuals or objects having common observable characteristics. The population of this study was comprised of all credit managers from depositing taking microfinance institutions which were participating in credit information sharing in Kenya. According to (C.B.K, 2013) there were only 8 Depositing Taking Microfinance institutions (DTMs) in Kenya which were allowed to participate in credit information sharing.

For the purpose of this study, only 5 DTMs were considered being those that had converted to DTMs by the year 2010 when sharing of credit information started. This was to enable for the determination of the effect of credit information sharing. A similar approach was adopted by McIntosh, Sadoulet and De Janvry (2006) in a study on credit sharing impact on microfinance in Latin America. Therefore the population of study was comprised of 54 credit managers drawn from these 5 DTMs which were; Faulu Kenya DTM, Kenya Women Finance Trust DTM, Remu DTM, Uwezo DTM and SMEP DTM.

3.4 Sampling frame

A sampling frame has the property that the study can identify every single element and include any in the sample (Saunders et al., 2007). In this study the sampling frame consisted of a list of registered DTMs (CBK, 2012).

Table 3.1: Sampling Frame

Deposit Taking Microfinance Institution	Year of Registration	Year of Conversion to become a DTM	Number of Credit Managers
Faulu Kenya DTM	1991	June 2009	27
KWFT DTM	1981	March 2010	16
Remu DTM	2008	July 2010	3
Uwezo DTM	2007	Nov 2010	2
SMEP DTM	1999	Dec 2010	6
TOTAL			54

Source: C.B.K (2012)

3.5 Sampling and sample size

A sample is defined as a subset of the population that is selected for analysis (Bryman & Bell, 2003). A representative sample is one that accurately reflects the population being sampled. Given that the population of the study is 54, a census of all the credit managers was carried out hence no sampling was done. Use of census was applied in a similar study by Muthoni (2014) on Credit information sharing, bank characteristics and credit market performance in Kenya where the researcher carried out a census of the all the 44 credit managers in these banks since the respondents were considered to have a better understanding of the variables under study in their respective institutions.

3.6 Data Collection Procedures.

Primary data was collected using a predetermined questionnaire from all the credit managers at the branch level. The questionnaire comprised of questions meant to meet the objectives of the study. Some questions were closed ended to enhance uniformity and others open ended to ensure maximum data is obtained. Questionnaires were self administered. Secondary data was obtained from Central Bank of Kenya.

3.7 Pilot Testing

A pilot study was done to assess the capability of the research instruments to collect the required data for the research (Bryman & Bell, 2003). Zikmund (2010) stresses the importance of pre-testing the questionnaire. This is done to obtain feedback, to check that the questionnaire is effective and well understood by the respondents. The pilot testing will assist in identifying and rectifying weaknesses in the questionnaire before the actual research was carried out using 4 credit managers from microfinance banks because they share quite a number of characteristics with the deposit taking microfinance institutions. Mugenda and Mugenda (1999) observes that a successful pilot study uses 1% to 10% of the actual sample size.

3.7.1 Validity

Validity is the degree to which a questionnaire captures information that reflects reality (Howard, 2008). The focus here is not necessarily on scores or items, but rather inferences made from the instrument. It involved a focus on content validity, construct validity, and criterion validity. Content validity considered whether or not the items on a given test accurately reflect the theoretical domain of the construct it claims to measure. This was measured through seeking of expert opinion on whether the instrument is appropriate. The construct validity of a measure is directly concerned with the theoretical relationship of a variable to other variables. This was ascertained by clearly defining the variable being measured, formulating the hypothesis based on theory underlying a variable and then testing the hypothesis logically and empirically. Criterion validity refers to the ability to draw accurate inferences from the existence of a current condition. It was measured as a coefficient of correlation between test scores and another of known validity (Howard, 2008).

3.7.2 Reliability

Reliability refers to the extent to which the data collection techniques or analysis procedures will yield consistent findings (Smith, 2008). Reliability of the questionnaire was evaluated through administration of the questionnaire to the pilot group after which internal consistency was determined by computing the construct composite reliability co-efficient (Cronbach alpha). Cooper and Schindler (2008) suggest that a Cronbach's alpha coefficient of 0.7 is adequate. Therefore the reliability results were evaluated on this basis.

3.8 Measurement of Variables

3.8.1 Measurement of Independent Variables

Demographic information was determined on the different kinds of information shared that is related to the customer's in terms of gender, income, Household size, age, Marital status, employment status & business ownership and their relative importance when making lending decisions. Repayment history was measured by

looking at the amount of non-performing loans and the provision for bad loans. Borrower`s current loans was measured in terms of borrowers`current loans. Character information was measured in terms of reputation, honesty, consistency, knowledge and skills, experience, financial competency and plans for the future. Similar measures have been used in studies by Behr and Sonnelkalb (2012) and (Dejanvry, 2010).

3.8.2 Measurement of Dependent Variable

In this study the dependent variable was performance of deposit taking microfinance institutions. This was measured in terms of: interest income from loans, profitability and portfolio yield. Similar measures have been used in studies by Behr and Sonnelkalb (2012) and (Dejanvry, 2010).

3.9 Data analysis and Presentation

Analysis of the data was done using a combination of designs including descriptive statistics which include means, standard deviations, frequencies, percentages, regression and inferential analysis. In this study multiple linear regressions was used to test the relationship between the independent and dependent variables.

3.9.1 Statistical Model

Performance is a function of demographic information, repayment history, borrower`s current loans and character information. Given that the function is linear,

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where;

B_0 = Constant

$\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients of determination

Y =Performance of DTMs (dependent variable)

Independent variables;

X_1 = Demographic information

X_2 = Repayment history

X_3 = Borrowers current loans

X_4 = Character information

ε = is the error term

The analysis of the model was based on a coefficient of determination (R^2) values. Sekaran and Bougie (2009) note that the coefficient of determination, R^2 , provides information about the goodness of fit of the regression model: it is a statistical measure of how well the regression line approximates the real data points'. The regression coefficients are usually the basis on which decisions about the existing relationships are deduced (Mugenda & Mugenda, 2003). R-squared was used to check the goodness of fit. Statistical significance was checked by an F-test of the overall fit, followed by t-tests of individual parameters.

Each variable was established and tested individually and then collectively. This was done through multiple regression because it helps understand to what extent does the model represent what is happening on the ground, how independent variables influence the dependent variable collectively, to what extent does each independent variable influence the dependent variable in a collective set up and also to determine which are the most significant variables(KIM,2009)

3.9.2 Hypotheses Testing

The hypotheses were tested as shown in table 3.2;

Table 3.2: Hypothesis testing

Hypothesis	Hypothesis Test	Regression model
H ₀₁ Demographic information has no significant effect on the performance of deposit taking microfinance institutions in Kenya	H ₀ : $\beta_1 = 0$ Vs H _a : $\beta_1 \neq 0$ Reject H ₀ if $p < 0.05$, otherwise fail to reject H ₀	$Y = B_0 + B_1X_1 + \epsilon$ Where; Y=Performance of DTMs B ₀ =Intercept B ₁ =Co-efficient for demographic Information X ₁ =Demographic information ϵ =error term
H ₀₂ Repayment history information has no significant effect on the performance of deposit taking microfinance institutions in Kenya	H ₀ : $\beta_2 = 0$ Vs H _a : $\beta_2 \neq 0$ Reject H ₀ if $p < 0.05$, otherwise fail to reject H ₀	$Y = B_0 + B_2X_2 + \epsilon$ Where; Y=Performance of DTMs B ₀ =Intercept B ₂ =Co-efficient for repayment history X ₂ =Repayment history ϵ =error term
H ₀₃ Borrower`s current loans information has no significant effect on the performance of deposit taking microfinance institutions in Kenya	H ₀ : $\beta_2 = 0$ Vs H _a : $\beta_2 \neq 0$ Reject H ₀ if $p < 0.05$	$Y = B_0 + B_3X_3 + \epsilon$ Where; Y=Performance of DTMs B ₀ =Intercept B ₃ =Co-efficient for borrower`s current loans X ₃ =Borrower`s current loans ϵ =error term
H ₀₄ Character information of a borrower has no significant effect on the performance of microfinance deposit taking institutions in Kenya	H ₀ : $\beta_2 = 0$ Vs H _a : $\beta_2 \neq 0$ Reject H ₀ if $p < 0.05$	$Y = B_0 + B_4X_4 + \epsilon$ Where; Y=Performance of DTMs B ₀ =Intercept B ₄ =Co-efficient for character information X ₄ =Character information ϵ =error term
H ₀₅ Regulatory framework has no significant moderating effect on the relationship between credit information shared and the performance of deposit taking microfinance institutions in Kenya	H ₀ : $\beta_5 = 0$ Vs H _a : $\beta_5 \neq 0$ Reject H ₀ if $p < 0.05$, otherwise fail to reject H ₀	$Y = B_0 + B_5X_5 + \epsilon$ Where; Y=Performance of DTMs B ₀ =Intercept B ₅ =Co-efficient for regulatory framework X ₅ =Regulatory framework ϵ =error term

3.10 Test of assumptions

3.10.1 Testing for normality

Osborne and Waters (2002) propose that regression analysis assumes that data is normally distributed. Data that is not normally distributed can distort relationships and significance tests, hence affect statistical inference. A normality test was done using Q-Q probability plot for all the variables under investigation.

3.10.2 Testing for linearity

Linearity is an important association between the dependent variable and independent variables. Multiple linear regression can only accurately estimate the relationship between dependent and independent variable if the relationship is linear in nature (Osborne & Waters, 2002). The assumption of linearity was measured using the normal probability plot (Q-Q plot).

3.10.3 Testing for multicollinearity

Multi-co linearity is a statistical phenomenon in which two or more predictor variables in a model are highly correlated (Gujarat & Porter, 2009). Myers (1990) suggests that a (V.I.F) value greater than 10 is a sign of co linearity and a cause of concern.

3.10.4 Testing for Heteroscedasticity

Heteroskedasticity describes a situation in which the error term is not the same across all values of the independent variable. Heteroskedasticity was evaluated using a scatter plot in which the regression standard residuals for the independent variables were plotted against the dependent variable. If there is no heteroskedasticity, the plot should look random. If you see a pattern such as a funnel shape, this indicates heteroskedasticity (Zikmund, 2010).

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter deals with organization and presentation of research data obtained from the respondents. It also captures the background of the population under study. The data is presented in a manner that is easy to interpret and understand. Data analysis was based on the objectives of the study as presented in chapter one. The chapter presents the analysis of data using descriptive and inferential statistics and its interpretation as was collected from the field. Data analysis was done using descriptive and inferential statistics.

4.2 Response Rate

The researcher issued 54 questionnaires to credit managers out of which 48 questionnaires were returned and analyzed. This gave a response rate of 89%. According to Mugenda and Mugenda (2003), a response rate of 50% is adequate, 60% is good and 70% and above very good. Based on the above, the response rate was very good.

4.3 Pilot Study Results

Reliability of the questionnaire was evaluated through administration of the questionnaire to the pilot group after which internal consistency was determined by computing the construct composite reliability co-efficient (Crobanch alpha). Cooper and Schindler (2008) affirm that a Cronbach's alpha coefficient of 0.7 and above is adequate and therefore the results can be generalized on the population. In this study all variables had a Cronbach's alpha coefficient of 0.7 and above as shown in table 4.1 hence the results can be generalized to the population.

Table 4.1: Reliability Results

Variables	Cronbachs' Alpha	Number of Items
Demographic information	0.72	23
Repayment history	0.848	4
Borrowers current loans	0.78	4
Character Information	0.71	16
Performance	0.86	6

4.4 Background Information

4.4.1 Number of branches

The branch network distribution was sought. As shown in table 4.2. Faulu DTM had the highest number of branches at 47.9% while the Uwezo DTM had the least number of branches which is just 4.2% of the deposit taking microfinance institutions. The others include KWFT with 29.2%, Remu 6.3 %, and SMEP 12.5%.

Table 4.2: Number of branches

Name of Institution	Frequency	Percentage
FAULU	23	47.9
KWFT	14	29.2
REMU	3	6.3
UWEZO	2	4.2
SMEP	6	12.5
Total	48	100.0

Source: CBK(2012)

4.4.2 Region of operation

On the basis of region of operation, as shown in table 4.3 the largest number of DTMS was located in Nairobi with 27.1 % of the total DTMS while the regions with the least number of DTMS is Nyanza and Western with each region accounting for 4.2% of the total DTMS. Other regions include Central with 16.7%, Eastern 14.6%, Coast 10.4% and Rift valley 22.9%

Table 4.3: Area of Operation

	Frequency	Percentage
Nairobi	13	27.1
Central	8	16.7
Eastern	7	14.6
Western	2	4.2
Coast	5	10.4
Nyanza	2	4.2
Rift valley	11	22.9
Total	48	100.0

4.4.3 Number of Products

The number of products per DTM was sought. As shown in table 4.4, Faulu DTM had the highest number at 10 while the REMU DTM had the least number of products with only 6. The others include KWFT with 8, Uwezo and SMEP with 7. The mean of the products is 8 suggesting that customers have a wide range of products to choose from

Table 4.4: Number of Products

Name of DTM	Frequency(Number of products)
FAULU	10
KWFT	8
REMU	6
UWEZO	9
SMEP	7

4.4.4 Gender

On the basis of the gender of customers as shown in table 4.5, 54.2 % comprise of male while female comprise of 45.8 %. The restriction of women from having access to and control of property constitutes a fundamental constraint on women entrepreneurs to access finance. Women usually face discrimination in the labour market in terms remuneration and the nature of job they are offered and this affects their income, investment and savings compared to men (DeTienne & Chandler, 2007).

Table 4.5: Gender

Gender	Percent
Male	54.2
Female	45.8
Total	100.0

4.4.5 Marital Status

The researcher also sought to find out the marital status of the customers. As shown in table 4.6, the largest numbers of clients are married and this comprised 75% while

those who are single accounting for 22.9% of the clients while the widowed are 2.1%. This shows that when one is married their tendency to take up loans is higher compared to those who are single and widowed. Studies have also established that marital status is an element that influences an individual's financing options (Davidson & Honig, 2003).

Table 4.6: Marital Status

Marital Status	Frequency	Percent
Married	36	75
Single	11	22.9
Widowed	1	2.1
Total	48	100.0

4.5 Test of assumptions of study variables

4.5.1 Testing for normality

Osborne and Waters (2002) propose that regression analysis assumes that data is normally distributed. Data that is not normally distributed can distort relationships and significance tests, hence affect statistical inference. A normality test was done using Q-Q probability plot for all the variables under investigation. The Q-Q plot is a reliable way to determine whether the data deviate from other distributions and is mostly interested in the normal distribution. The resulting scatter plot shows the relationship between the actual observed values and what those values would be expected when the data is normally distributed. Shenoy and Madan (1994) observed that the potential to have normal residuals is to have a dependent variable which is normally distributed. For data to be normally distributed, the observed values should be spread along the straight diagonal line. This is shown in figure 2 which indicates that most of the observed values are spread very close to the straight line implying that the data is normally distributed.

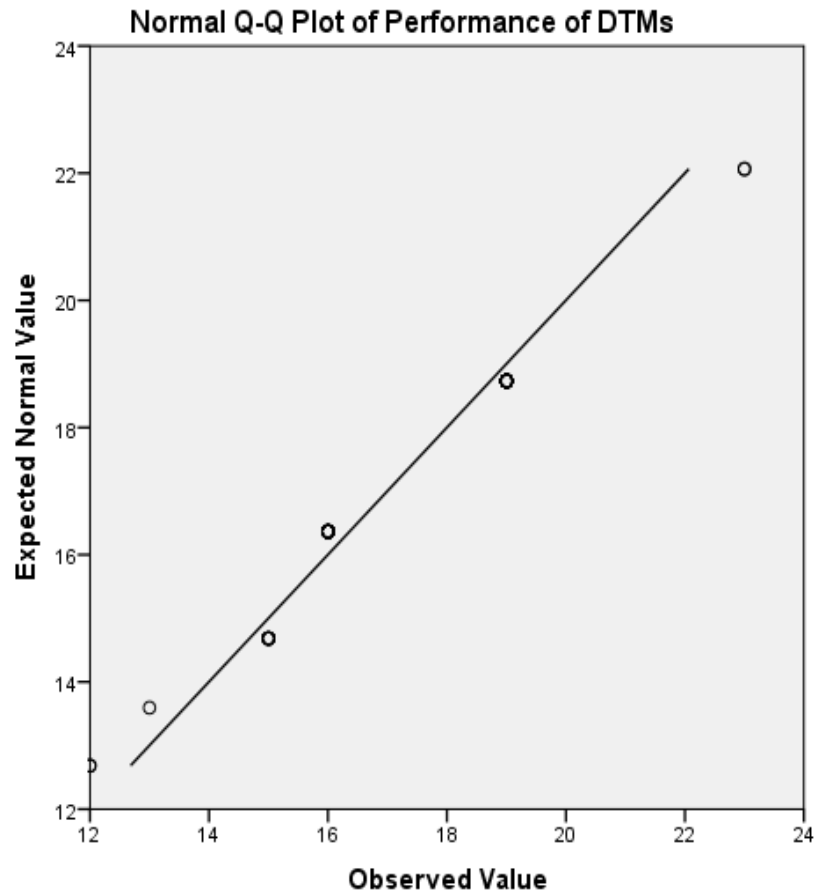


Figure 4.1: Q-Q plot for normality test

4.5.2 Testing for linearity

Linearity of data refers to values of the outcome variable for each increment of a predictor variable which lie along a straight line (Ombaka, 2014). Linearity is an important association between the dependent variable and independent variables. Multiple linear regression can only accurately estimate the relationship between dependent and independent variable if the relationship is linear in nature (Osborne & Waters, 2002). Absence of a linear relationship between independent variables and dependent variable leads to the results of regression analyses to underestimate the true relationship.

The assumption of linearity was measured using the normal probability plot (Q-Q plot). In this plot, the observed value for each score is plotted against the expected value from the normal distribution. A reasonably straight line suggests a normal distribution. As shown in figure 4.2, the Q-Q plots indicate that the values did not deviate much from the expected values.

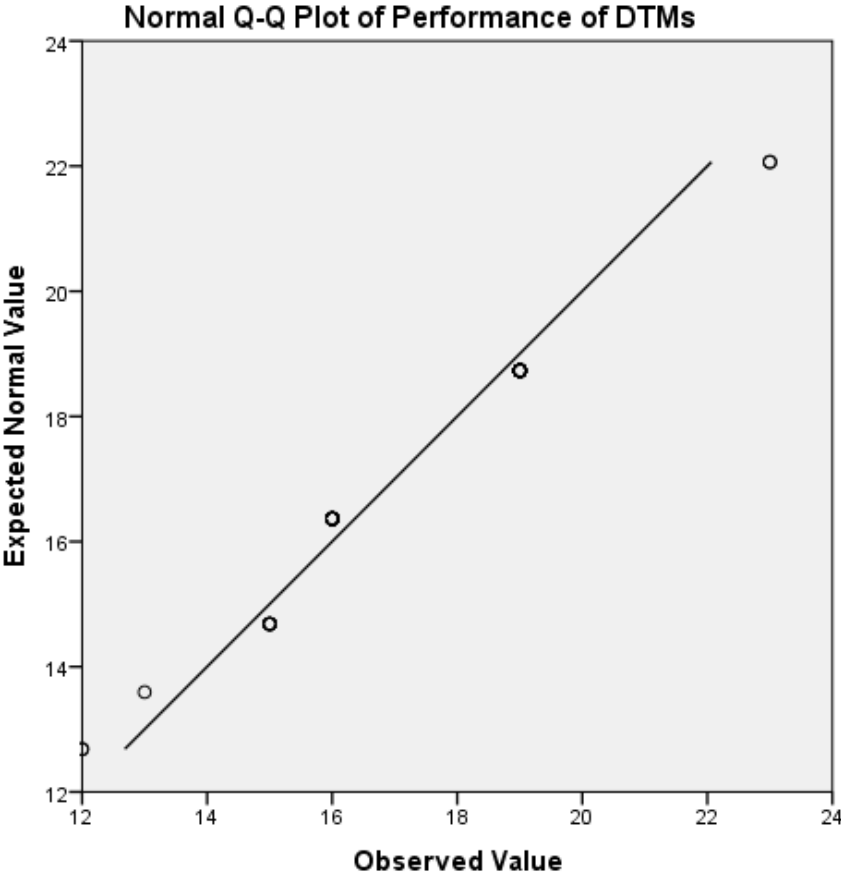


Figure 4.2: Normal probability plot (Q-Q plot) of performance of DTMs

4.5.3 Testing for multicollinearity

Multicollinearity is a statistical phenomenon in which two or more predictor variables in a model are highly correlated (Gujarat & Porter, 2009).Graham (2002) argued that variables that have a Variable Inflation Factor VIF of around or greater than 5, should be removed from the regression model. Myers (1990) suggests that a

(V.I.F) value greater than 10 is a sign of collinearity and a cause of concern. The study therefore concluded that there was no multicollinearity problem between variables since the VIF for all variables is 5 as shown in table 4.7.

Table 4.7: Test for multicollinearity

Model		Collinearity Statistics	
		Tolerance	VIF
1	Demographic Information	.948	1.055
	Repayment History	.763	1.311
	Borrowers`current loans	.791	1.265
	Character Information	.971	1.030

a. Dependent Variable: Performance of DTMs

4.5.4 Testing for Heteroscedasticity

Homoscedasticity refers to the assumption that the dependent variable exhibits similar amounts of variance across the range of values for an independent variable. Heteroskedasticity describes a situation in which the error term is not the same across all values of the independent variable. Heteroskedasticity was evaluated using a scatter plot in which the regression standard residuals for the independent variables were plotted against the dependent variable .If there is no heteroskedasticity, the plot should look random. If you see a pattern such as a funnel shape, this indicates heteroskedasticity. (Zikmund, 2010). Based on the scatter plot as shown in figure 4.3, there is no heteroskedasticity.

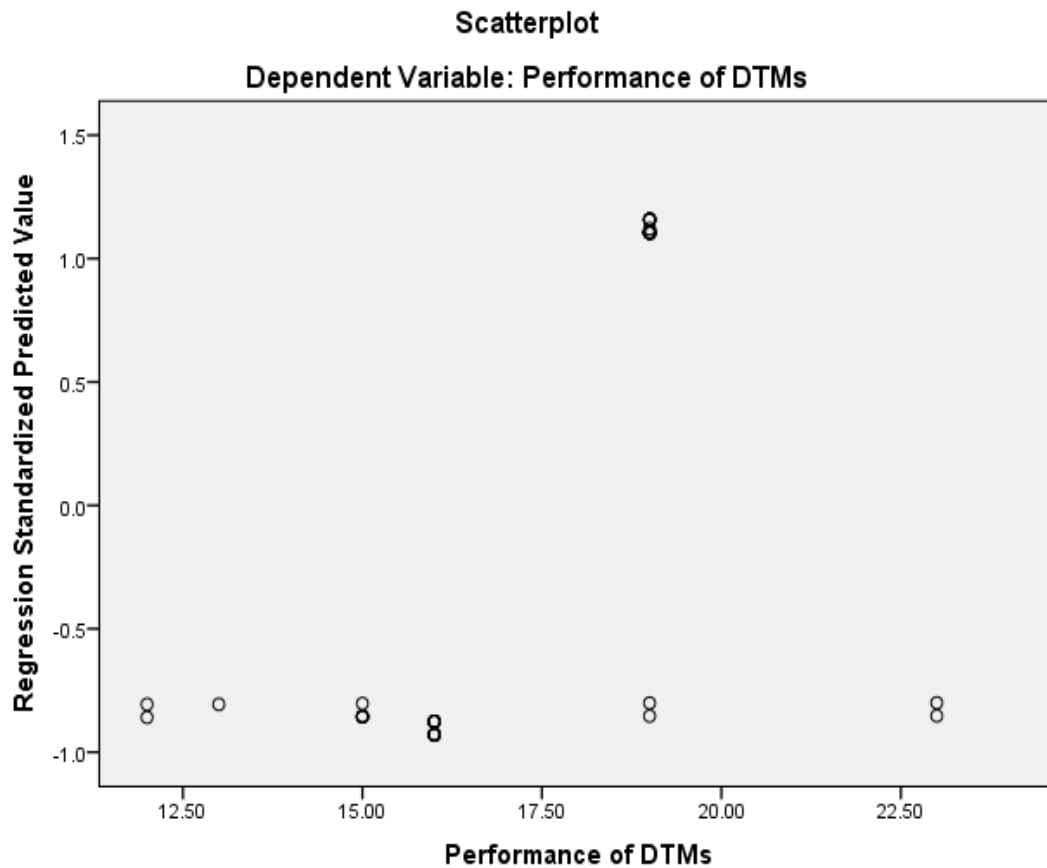


Figure 1.3: Scatter Plot

4.6 Correlation results for study variables

4.6.1 Correlation results for demographic information and performance

Pearson correlation coefficient was used to determine whether there exists a relationship between demographic information and performance. Table 4.8 presents findings on correlation analysis where ($r=0.124$, $\alpha=0.05$). This shows that there is a weak positive relationship between demographic information and performance. This finding is similar to Madrid and Minnetti, (2009) who found out that communicating default data and disclosing borrowers' characteristics has effects on the probability of default. The disciplinary effect arises only from the exchange of default information. If financial institutions also share data on borrowers' characteristics, they actually

reduce the disciplinary effect of information sharing. A high quality borrower will not be concerned about his default being reported to outside banks if they are also told that he is a high-quality client. But, as discussed above, exchanging information about borrowers' characteristics may reduce adverse selection or tamper hold-up problems in credit markets, and thereby reduce default rates.

This finding differs with Cheng and Degry's (2010) who in a study on information sharing and credit rationing through public credit registry affects banks' lending decisions found out that availability for the group of borrowers with external information is statistically not different from that of borrowers without external information. In addition, the bank does not tend to grant lower credit lines to the group of borrowers whose external information is provided than to those without external information. This suggests that sharing information to other banks does not decrease this bank's willingness to lend.

Pagano (2005) found out that the type of data reported is a key element in the success of credit information sharing initiatives. The simplest and most inexpensive systems are black lists, which contain information only on defaulters. These are most effective in correcting moral hazard problems in the credit market, owing to their disciplinary effect via reputational mechanisms. Intermediate systems also include reporting of loan amounts, so that lenders may form a more precise estimate of the total indebtedness of credit seekers. Such information helps to correct the moral hazard problems that may arise if loan contracts are non-exclusive. The most sophisticated systems also include other forms of information about borrowers' characteristics, such as demographic information for households and accounting information for firms. A system that provides much information about borrowers' characteristics may lead banks to identify high-quality borrowers more easily, but by the same token such borrowers will be less worried to be reported as defaulters, trusting that their reputation will not be stained by such an event. As a result, they may exert less effort to avoid default.

Table 4.8: Correlation results for demographic information and performance

		Performance of DTMs	Demographic Information
Performance of DTMs	Pearson Correlation	1	.124
	Sig. (2-tailed)		.402
	N	48	48
Demographic Information	Pearson Correlation	.124	1
	Sig. (2-tailed)	.402	
	N	48	48

4.6.2 Correlation results for repayment history and performance

Pearson correlation coefficient was used to determine whether there was a relationship that existed between repayment history and performance. Correlation analysis results as presented in table 4.9 shows that ($r=0.616$, $\alpha=0.01$). This shows that there is a positive relationship between repayment history and performance. This finding is similar to McIntosh, Sadoulet and De Janvry (2006) in a study on credit reference bureau impact on microfinance in Latin America found out that the administrative records showed that credit bureau use has a large and positive impact on loan performance.

In addition, this finding is similar to Powell (2004) who found out that a list of negative information often referred to as a blacklist, can encourage borrowers to repay obligations so as to stay off the list. The existence and use of such a database then enhances willingness to pay. Negative only databases have several shortcomings compared to those with complete (both positive and negative) information. Negative information alone has less predictive power than positive and negative information combined. Decision tools, such as credit scoring, are difficult to develop without positive data. Databases with only negative information then tend to focus only willingness to pay and not on enhancing predictions on repayment probabilities.

A database of positive and negative information assists borrowers in developing proof of a good payment history. The value that the debtor attaches to his or her good credit history is likely to be greater than the value associated with being off the blacklist, especially since most negative information databases enable borrowers to settle claims to remove themselves from the list. This prompts eventual repayment of obligations but does not provide strong incentives for borrowers to conduct themselves responsibly over longer periods of time. The greater the value of reputation collateral is to borrowers, the harder borrowers will work to maintain good standing. Thus, if it is known that the database is used extensively for credit decisions then willingness to pay risks will be reduced further. Again, this is particularly important for borrowers who lack physical collateral, such as low-income individuals or small firms.

Table 4.9: Correlation results for repayment history and performance

		Performance of DTMs	Repayment History
Performance of DTMs	Pearson Correlation	1	.616**
	Sig. (2-tailed)		.000
	N	48	48
Repayment History	Pearson Correlation	.616**	1
	Sig. (2-tailed)	.000	
	N	48	48

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

4.6.3 Correlation results for borrower's current loans and performance

Pearson correlation coefficient was used to determine whether there is a relationship that exists between borrower's current loans and performance. Correlation analysis results as presented in table 4.10 shows that ($r=-0.298$, $\alpha=0.05$) .This shows that there is a negative relationship between borrowers current loans and performance.

This finding is similar to Pagano (2010) who found out that when the consumer applies for a loan from the bank, each additional amount he borrows reduces the probability of repayment of the capital and interest to the credit card company. Thus, the consumer's expected repayment per shilling of debt is a decreasing function of his total debt and he has the incentive to over-borrow. Anticipating this moral hazard, both lenders will ration the amount of credit supplied or even deny credit unless assisted by collateral or covenants restricting total debt. This moral hazard problem disappears if the banks agree to reveal to each other the magnitude of the credit extended to the client. So, when lenders share information about current loans they can be expected to increase the supply of lending and/or improve the interest rates offered to credit borrowers.

Galindo (2010) found out that a complementary response to the problem of asymmetric information is through mechanisms that allow lenders to discover the repayment potential of lenders. This is done through credit information sharing where the borrowing and payment history of lenders is recorded. This mechanism creates a different form of collateral in the form of reputation collateral that can be used to screen potential borrowers when granting loans. Based on credit histories or on other type of reputation collateral a borrower can gain access to credit. It is a common policy among banks to grant credit to new individuals only after they can observe their cash flows. The same principle applies to the clients of other banks. Accumulated information on credit histories, collateral or current debt exposure can be shared among lenders, reducing asymmetries and improving efficiency in the allocation of resources. The role of credit bureaus is to collect, to distribute, and often to analyze information on a borrower's behavior from a variety of sources for creditors to screen potential clients (Galindo, 2010).

Table 4.10: Correlation results for borrower's current loans and performance

		Performance of DTMs	Borrowers`current loans
Performance of DTMs	Pearson	1	-.298*
	Correlation		
	Sig. (2-tailed)		.040
	N	48	48
Borrowers`current loans	Pearson	-.298*	1
	Correlation		
	Sig. (2-tailed)	.040	
	N	48	48

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

4.6.4 Correlation results for character information and performance

Pearson correlation coefficient was used to determine whether there is a relationship that exists between character information and performance. Correlation analysis results as presented in table 4.11 shows that ($r=-0.063$, $\alpha=0.05$). This shows that there is a negative relationship between character information and performance. This finding is similar to Pagano and Jappelli (1993) who found out that when risky borrowers are known the volume of credit decreases with information sharing on new borrowers because the new entrants may not compensate the decrease in risky borrowers.

Table 4.11: Correlation results for character information and performance

		Performance of DTMs	Character Information
Performance of DTMs	Pearson Correlation	1	-.063
	Sig. (2-tailed)		.670
	N	48	48
Character Information	Pearson Correlation	-.063	1
	Sig. (2-tailed)	.670	
	N	48	48

4.7 Regression Analysis

4.7.1 Regression Results on the effect of demographic information on the performance of DTMs

H₀₁: Demographic information has no effect on the performance of deposit taking microfinance institutions in Kenya

Regression analysis was conducted to determine whether there was a significant relationship between demographic information and the performance of DTMs. Table 4.12 presents the regression model of demographic information on performance of DTMs. As presented in the table, the coefficient of determination R square is 0.015 at 5 % significance level. This means that 1.5 % of the variation on DTMs performance is influenced by demographic information. This finding is similar to Hans (2010) in a study on credit information sharing and credit rationing where the results show that availability of credit to a group of borrowers with external information is statistically different from that of borrowers without external information. In addition, the bank does not tend to grant lower credit lines to the group of borrowers whose external information is provided to the Public Registry only by this bank than to those without external information. This suggests that

sharing information to other banks does not decrease this bank’s willingness to lend. However, the distribution of granted credit between different groups of borrowers with external information is significantly different. On average, borrowers with extra information.

Table 4.12: Regression model summary for demographic information

Model	R	R Square	Adjusted R Square
1	.124 ^a	.015	-.006

a. Predictors: (Constant), demographic information

4.7.2 ANOVA Regression results for demographic information and performance of DTMs

The results of analysis of variance (ANOVA) on demographic information and performance of DTMs are presented in the table 4.13. The F value= 0.716, P =0.402 and since $p > 0.05$ we fail to reject the null hypothesis and conclude that there is no significant effect of demographic information on performance of DTMs .This differs with the findings by Janvry (2006) in a study on the demand and supply impacts of credit market information who found out that the strongest effect of improved information is through the ability to increase loan volumes faster than would otherwise have been the case. This demonstrates that sharing of credit information is an efficient institutional innovation not only in assisting client selection by lenders and group borrowers alike, but that additional improvements are realized when borrowers clearly understand the implications of information sharing arrangements. Borrowers with good credit records are also able to take advantage of this information sharing to get access to more loans outside their current lenders.

Table 4.13: ANOVA Regression results for demographic information

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.006	1	4.006	.716	.402 ^b
	Residual	257.244	46	5.592		
	Total	261.250	47			

a. Dependent Variable: Performance of DTMs

b. Predictors: (Constant), Demographic Information

The study further determined the beta coefficients of demographic information on performance of DTMs. Table 4.14 shows that the relationship between demographic information and performance of DTMs is positive since the coefficient of demographic information is 0.493 which is greater than zero. The fitted model is $Y=16.831+ 0.493X_1$. This implies that a unit change in demographic information will increase the performance of DTMs by the rate of 0.493. This finding is similar to McIntosh, Sadoulet and De Janvry (2006) who in a study on credit reference bureau impact on microfinance in Latin America found out that the administrative records showed that credit information sharing has a large and positive impact on loan performance. Before entry, the proportion of both individual and group loans in arrears was roughly stable, with the performance of group loans dominating that of individual loans. After credit bureau information started to be used by credit agents in selecting new clients, the average percentage of individual loans with at least one late payment decreased from 67.2% for pre-credit bureau loans to 52.8% for post-credit bureau loans.

Table 4.14: Coefficient for Demographic Information

Model		Unstandardized		Standardized	t	Sig.
		Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	16.831	.728		23.113	.000
	Demographic Information	.493	.583	.124	.846	.402

a. Dependent Variable: Performance of DTMs

4.7.3 Regression results on the effect of repayment history on performance of DTMs

H₀₂: Repayment history has no effect on the performance of deposit taking microfinance institutions in Kenya

Regression analysis was conducted to determine whether there was a significant relationship between repayment history and the performance of DTMs. Table 4.15 presents the regression model on repayment history on performance of DTMs. As presented in the table, the coefficient of determination R square is 0.379 at 5 % significance level. This means that 37.9% of the variation on DTMs performance is influenced by repayment history. This finding is similar to Luoto et al. (2007) in an evaluation of the effects of the implementation of a credit bureau in the microfinance sector in Guatemala using branch-level data from a large Microfinance Institution identifies a 3.3% reduction in institutional default rates after the risk bureau was established. In addition the findings are similar findings to Minnetti and Dobbilas (2013) in an investigation on the consequences of lenders' information sharing using unique contract-level data from a credit bureau that serves the U.S. equipment finance industry they found evidence that lenders' information exchange has a beneficial impact on the repayment behavior of firms, reducing the incidence of delinquencies and foreclosures of loans and leases.

When financial institutions share default information, default becomes a signal of bad quality for outside banks and carries the penalty of higher interest rates or no future access to credit. To avoid this penalty, entrepreneurs exert more effort, leading to lower default and interest rates and to more lending. Disclosing information about borrowers' quality, instead, has no effect on default and interest rates, in contrast with the results of Padilla and Pagano (1997). Competition is assumed to eliminate the informational rents of banks anyway, so that their customers' interest burden cannot be reduced further. As a result; when information about their quality is shared, borrowers have no reason to change their effort level and equilibrium default and interest rates stay unchanged. Information sharing about borrowers' quality can even reduce lending. When they share such information, banks lose all future informational rents and therefore, require a higher probability of repayment to be willing to lend. So, the credit market may collapse in situations in which it would be viable under no information sharing.

Another interesting implication is that sharing more information than just defaults reduces rather than increases borrowers incentive to perform. If high grade borrowers know that their bank will disclose not only their past defaults but also data about their intrinsic quality, the borrowers are assured that in their case, other banks will not interpret a default as a sign of low quality. Thus, to the extent that banks also share data on borrower's characteristics, they actually reduce the disciplinary effect of information sharing (Jappelli & Pagano, 2000).

Information sharing can also create incentives for borrowers to perform in line with the banks' interests. Klein (1992) showed that information sharing can motivate borrowers to repay loans, when the legal environment makes it difficult for banks to enforce credit contracts. In this model, borrowers repay their loans because they know that defaulters will be blacklisted, reducing external finance in the future.

Sharing information generates two contradictory effects over firms' access to credit. First, it makes the investigation process cheaper, which could increase access to credit. Small and medium loans are too small to justify a full fledged research process; without information sharing granting these loans may be too expensive. Assuming

small and medium firms get small and medium loans, these firms would be the main beneficiaries of information sharing. The second effect of information sharing over firms' access to credit is negative: those firms that have a bad history see their access restricted. Both effects are desirable from the point of view of a healthy financial system, but from firms' perspective, if the second effect were to dominate, it would mean less access to credit (Shleifer, 2007).

Table 4.15: Regression model summary for repayment history

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.616 ^a	.379	.365	1.87812

a. Predictors: (Constant), Repayment History

4.7.4 ANOVA Regression results for Repayment History

Table 4.16 presents the results of Analysis of Variance (ANOVA) on repayment history and performance of DTMs. The F value= 28.064, P =0.000 and since $p < 0.05$ we reject the null hypothesis and can conclude that there is a significant effect of repayment history on performance of DTMs. This finding is similar to Behr and Sonnekalb (2012) in a study on effect of information sharing between lenders show an improvement in loan performance as a result of the introduction of the credit information sharing. When credit information is shared, the uninformed financial institution becomes more aggressive about the good quality transactional customers with no-default in history and less aggressive about the defaulting borrowers: borrowers in the latter group stay more with the incumbent, who therefore invests more in their type. The reason for this is that the defaulting group is on average more risky and information collection may help reveal many un-creditworthy borrowers and thus avoid losses. As a result, the higher information acquisition improves the accuracy of lending decisions, increase welfare and may be particularly useful for small firms that are differentiated along disadvantaging characteristics. Information

sharing increases financial institution’s relationship lending thus small financial institutions are able to improve on their performance (Karapetyan, 2009).

Table 4.16: ANOVA Regression results for Repayment History

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	98.992	1	98.992	28.064	.000 ^b
	Residual	162.258	46	3.527		
	Total	261.250	47			

a. Dependent Variable: Performance of DTMs
b. Predictors: (Constant), Repayment History

The study further determined the beta coefficients of repayment history on performance of DTMs. Table 4.17 shows that the relationship between repayment history and performance of DTMs is positive since the coefficient of repayment history is 0.208 which is more than zero. The fitted model is $Y=16.088+ 0.208X_2$. This implies that a unit change in repayment history will increase the performance of DTMs by the rate of 0.208. The findings differ with those by Behr and Sonnekalb (2012) who in determining the effect of information sharing between lenders point to a reduction in access to credit and an increase in the cost of credit .This shows that although the overall effect of credit information sharing is positive the access to credit is reduced.

The effect of information sharing on loan performance is stronger for repeat loans. If borrowers have to rely on relationships to reduce their opaqueness to lenders and to prove creditworthiness, they have strong incentives to exhibit a particularly large effort to repay loans at the beginning of the relationship. Clients with a longer relationship with the lender have better repayment because they have already secured a certain relationship with the lender. For them, there is room for further disciplining through information sharing. The arrear probability reducing effect is more pronounced for repeat loans. The co-efficient are insignificant for first loans while

they are significant and more than twice as large for repeat loans. These findings suggest that information sharing improves loan performance mainly by disciplining borrowers to repay (Madrid & Minetti, 2009).

Table 4.17: Coefficients for Repayment History

Model		Unstandardized		Standardized	T	Sig.
		Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	16.088	.364		44.204	.000
	Repayment History	.208	.039	.616	5.298	.000

a. Dependent Variable: Performance of DTMs

4.7.5 Regression results on the effects of Borrowers Current Loans on DTMs performance

H₀₃: Borrower`s current loans information has no effect on the performance of deposit taking microfinance institutions in Kenya

Regression analysis was conducted to determine whether there was a significant relationship between borrower`s current loans and the performance of DTMs .Table 4.18 presents the regression model on borrower`s current loans on performance of DTMs. As presented in the table, the coefficient of determination R square is 0.089 and at 5 % significance level. This means that 8.9 % of the variation on DTMs performance is influenced by borrower`s current loans. This finding is similar to the outcome by Bustelo (2009) in a study on integrating microfinance to credit information sharing in Bolivia found out that the new private credit bureau greatly improved lending operations particularly for MFIs. With the new bureau, lenders could verify the overall indebtedness of a customer before extending credit.

In practice, credit seekers may apply simultaneously for credit from several lenders and often manage to get loans and lines of credit from more than one. Jappelli and Pagano (2000) note that maintaining multiple bank relationships have several advantages from the standpoint of a borrower. First, it may help reduce the cost of credit by forcing the various providers of credit to compete. Second, each of the lenders will have to bear a smaller amount of risk, and therefore, will require a lower risk premium in the interest it charges. Third, being able to get credit from multiple lenders insures the borrower against the risk that any of the lenders may suddenly call back their loan or withdraw their line of credit. Multiple bank relationships have also costs; they discourage each bank from monitoring the borrower closely, lest other borrowers free - ride on its monitoring effort, and prevent the inter-temporal sharing of rent surplus that would be possible within an exclusive bank - firm relationship.

The cost of multiple lending relationships escalate if each potential lender has no clear information about how much credit the borrower has already obtained or will be able to obtain from other lenders. A borrower's default risk, from the viewpoint of a given lender, depends on the overall indebtedness of the borrower when their obligation towards that lender will mature. If this information is unavailable to the lender, the borrower has the incentive to over borrow. Anticipating this moral hazard, lenders will ration the amount of credit supplied and/or require a higher interest rate, or even deny all credit unless assisted by collateral or by covenants restricting total debt. (Jappelli & Pagano, 2000).

This particular form of moral hazard is eliminated if lenders agree to reveal to each other the magnitude of the loans and lines of credit that they have extended to each client. This suggests that when lenders share information about current loans, they can be expected to increase the supply of lending and/or improve the interest rates offered to credit seekers. Borrowers will, therefore, prefer those lenders to those that do not agree to communicate to each other such information. This explains why banks may want to pool data about the amount lent to each of their clients. Bernardo, Pagano and Piccolo (2007) show that the danger of over - lending that stems from this uncertainty may result in inefficiently scarce credit. Insofar as it makes lending

safer, information sharing about debt exposure can raise investment and welfare (Brown et al., 2007).

Table 4.18: Regression model summary for borrower`s current loans

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.298 ^a	.089	.069	2.27488

4.7.6 ANOVA Regression Results For Borrower`s Current Loans

Table 4.19 presents the results of Analysis of Variance (ANOVA) on borrowers and performance of DTMs. The F value=4.482, P =0.040 and since $p < 0.05$ we reject the null hypothesis and can conclude that there is a significant effect of borrower`s current loans on performance of DTMs .This finding is similar to Bennardo, Pagano and Piccolo (2009) who found out that Information sharing between lenders reveal borrowers` debt exposure to all participating lenders, eventually reducing aggregate indebtedness as highly indebted individuals receive less credit.

Table 4.19: ANOVA Results for borrower`s current loans

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	23.196	1	23.196	4.482	.040 ^b
	Residual	238.054	46	5.175		
	Total	261.250	47			

a. Dependent Variable: Performance of DTMs

b. Predictors: (Constant), borrower`s current Loans

The study further determined the beta coefficients of repayment history on performance of DTMs. Table 4.20 shows that the relationship between borrowers current loans and performance of DTMs is negative since the coefficient of repayment history is -0.0000000001924 which is less than zero. The fitted model is $Y=18.002-0.0000000001924X_3$. This implies that a unit change in borrowers' current loans will decrease the performance of DTMs by the rate of 0.0000000001924. This finding is similar to Brown and Zehnder (2007) who found out that information sharing helps lenders avoid serious losses from indebted borrowers. The study by Madrid and Minetti (2009) demonstrated that, after establishing a credit bureau, lenders were more likely to issue smaller and shorter-term loans and to require more guarantees. This explains the decline in performance due to a reduction in the amount of loans disbursed.

Table 4.20: Coefficients for Borrower`s Current Loans

Model	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
1 (Constant)	18.002	.442		40.718	.000
Borrowers`current loans	-1.924E-009	.000	-.298	-2.117	.040

a. Dependent Variable: Performance of DTMs

4.7.7 Regression Results on the effect of Character Information on performance of DTMs.

H₀₄: Character information has no effect on the performance of deposit taking microfinance institutions in Kenya

Regression analysis was conducted to determine whether there was a significant relationship between character information and the performance of DTMs. Table 4.21 presents the regression model of character information on performance of DTMs. As presented in the table, the coefficient of determination R square is 0.004 and at 0.05 significance level. This means that 0.4 % of the variation on DTMs performance is influenced by character information. Findings also support the theory that information sharing reduces moral hazard. Madrid and Minetti (2009) find that if lenders enter a credit information sharing institution, their borrowers improve their repayment performance delinquent payments on leases and loans decrease. Brown and Zehnder (2007) find empirical evidence that the lending market would collapse in the absence of information sharing institution and reputational banking. However, their study also showed that establishing a credit registry encouraged borrowers to repay their loans by allowing lenders to identify borrowers with a good payment history.

Table 4.21: Regression model summary for character information

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.063 ^a	.004	-.018	2.37840

a. Predictors: (Constant), Character Information

4.7.8 ANOVA Regression Results for Character Information

Table 4.22 presents the results of Analysis of Variance (ANOVA) on character information and performance of DTMs. The F value=0.813, P =0.670 and since $p > 0.05$ we fail to reject the null hypothesis and can conclude that there is no significant relationship between character and performance of DTMs. This finding differs with Mcintosh (2004) who found out that the strongest impact seen here is a huge decrease in the average number of missed payments; this outcome responds strongly to both presence and intensity of use of the bureau. The use of the bureau decreases the percentage of loans on which any payments are missed by 3.3 percentage points and the number of missed payments by 1.3.

Table 4.22: ANOVA regression results for character information and performance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.037	1	1.037	.183	.670 ^b
	Residual	260.213	46	5.657		
	Total	261.250	47			

a. Dependent Variable: Performance of DTMs
b. Predictors: (Constant), Character Information

The study further determined the beta coefficients of character information on performance of DTMs. Table 4.23 shows that the relationship between borrowers current loans and performance of DTMs is negative since the coefficient of repayment history is -0.307 which is less than zero. The fitted model is $Y=17.484-0.307X_4$. This implies that a unit change in borrowers' current loans will decrease the performance of DTMs by the rate of 0.307. Early research by Padilla and Pagano (2000) and Vercammen (1995) on developed credit markets suggests that sharing more detailed information on borrowers' characteristics and/or credit performance can reduce the disciplinary effects of a credit bureau. These studies argue that, in an adverse selection setting, the effectiveness of default as a bad signal is reduced as banks exchange better information on their clients. When richer information is disclosed, default is no longer a stigma because the riskiness of a borrower can now be inferred from the set of additional characteristics revealed by lenders. In other words, conditional on the additional characteristics revealed, default becomes a weaker predictor of the borrowers' type and future performance.

Table 4.23: Coefficients for Character Information

Model		Unstandardized		Standardized	t	Sig.
		Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	17.484	.427		40.929	.000
	Character Information	-.307	.718	-.063	-.428	.670

a. Dependent Variable: Performance of DTMs

4.8 Combined Effect Model

4.8.1 Multiple Linear Regression Results for all Variables

The study aimed at finding out the overall effect of the independent variables repayment history, borrowers' current loans, demographic and character information on performance of DTMs. The model $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$ explained 38 % of the variations in performance of DTMs as shown in Table 4.24. Madrid and Minetti (2009) find that if lenders enter credit information sharing institution, their borrowers improve their repayment performance delinquent payments on leases and loans decrease. Brown and Zehnder (2007) find empirical evidence that the lending market would collapse in the absence of information sharing institution and reputational banking. However, their study also showed that establishing a credit registry encouraged borrowers to repay their loans by allowing lenders to identify borrowers with a good payment history. Brown et al. (2009) show that credit information sharing reduces default rates using data from a panel of transition countries. Jappelli and Pagano (2002) show that credit levels are higher and default risk is lower in countries with credit information sharing. Hertzberg et al. (2010) found that lending to financially distressed firms declines when bad news about a firm's creditworthiness becomes public information.

Brown and Zehnder (2007) show that the introduction of information sharing significantly raises repayment rates in a market where borrowers are mobile and relationship banking is not feasible. Houston et al. (2010) provide evidence that the existence of credit information sharing lowers the probability of banking crises. In contrast to these studies, Cheng and Degryse (2010) fail to find a statistically significant effect of credit information sharing on the availability of credit.

Table 4.24: Multiple Linear Regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.616 ^a	.380	.322	1.94156

a. Predictors: (Constant), Repayment History, Character Information, Demographic Information, Borrowers` current loans

4.8.2 ANOVA results for credit information shared and performance

The analysis of variance results Table 4.25 shows that F value=6.576, P =0.000 and since $p < 0.05$ we can conclude that repayment history, borrowers` current loans, demographic, character information have a statistical significant combined effect on performance of DTMs. McIntosh and Wydick (2009) in a study on understanding screening, incentive and credit expansion effects found out that credit information sharing provides a scenario that mitigates adverse selection, an incentive effect that mitigates moral hazard, and a credit expansion effect that causes higher default rates from larger loans. Indeed, these three effects can be extended in a general way to other contexts where internet technology has increased the potential for agent information-sharing among principals in a market. Examples of this kind include automobile insurance firms pooling records across states, buyers and sellers sharing ratings information from past transactions. In each of these examples, principals first derive a screening effect by curtailing their interaction with some high-risk types. Secondly, principals benefit because awareness of the system induces some agents on the margin to improve their behavior. But more subtly, the increased confidence of principals over agent quality induces principals to extend riskier contracts to the

agents passing informational screening. This trust created by the system induces an offsetting behavior which is analogous to the credit expansion effect. The positive effects will overwhelm the latter negative effect, such that the overall effect of information sharing on repayment is positive. They found that the impact of the first intervention is similar and dominant regardless of whether the screening precedes information about the system or vice versa, and hence the effect on moral hazard of the bureau may have been dominant had the incentive effect preceded the screening effect (Mcintosh & Wydick,2009)

Table 4.25: ANOVA results for credit information shared and performance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	99.155	4	24.789	6.576	.000 ^b
	Residual	162.095	43	3.770		
	Total	261.250	47			

a. Dependent Variable: Performance of DTMs
b. Predictors: (Constant), Repayment History, Character Information, Demographic Information, Borrowers' current loans

4.8.3 Coefficients of credit information and performance of DTMs

The combined effect model as derived from the individual coefficients as shown on Table 4.26 is;

$$Y = 16.121 + 0.006 X_1 + 0.205 X_2 - 0.0000000001465 X_3 + 0.077 X_4 + \epsilon$$

The model above shows that demographic information(X_1), repayment history(X_2), and character information(X_4), positively influences performance while borrowers' current loans(X_3) influences performance negatively when the joint effect of all independent variables is put into consideration. A study by Brown and Zehnder (2007) showed that information sharing helped lenders avoid serious losses from

borrowers. The study by Doblaz-Madrid and Minetti (2009) demonstrated that after establishing a credit bureau, lenders were more likely to issue smaller and shorter-term loans and to require more guarantees. This shows that sharing information allows lenders to see the entire indebtedness of their borrowers and where this is high it results in the reduction of the overall indebtedness.

Through information sharing, a negative credit history or even default with one lender becomes transparent to all lenders. This, in turn, reduces the borrower's ability to secure future access to credit and disciplines the borrower to improve loan performance. As information sharing is predicted to improve performance during the loan term, the disciplinary effect can also impact the lender's decision at the loan approval stage. Even without any direct information on a particular applicant, the expectation of a lower average default probability should, in principal, increase the probability of approval for the average loan applicant (Vercammen, 1995; Padilla & Pagano, 2000). Moreover, information sharing may increase loan performance through improving direct borrower screening and selection at the loan approval decision stage (e.g. Pagano & Jappelli, 1993; Bennardo et al., 2010). If the lender is directly able to evaluate the applicant's credit situation and repayment history, it is able to select better borrowers. This leads to better quality and reduced default probability of the loans approved. Access to credit improves for the borrowers that are revealed to be good types and is reduced for the bad types. Information sharing may also increase competition between lenders and thereby reduce the cost of credit.

Table 4.26: Coefficients of credit information shared and performance of DTMs

Model		Unstandardized		Standardized	T	Sig.
		Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	16.121	.792		20.350	.000
	Demographic Information	.006	.491	.001	.012	.991
	Repayment History	.205	.047	.607	4.412	.000
	Borrowers`current loans	-1.465E-010	.000	-.023	-.168	.868
	Character Information	.077	.595	.016	.129	.898

a. Dependent Variable: Performance of DTMs

4.9 Moderating effects

4.9.1 Moderating Effect of Regulatory Framework on the Relationship between Credit Information Shared and Performance

One of the goals of this study was also to establish the moderating effects of the regulatory framework on the relationship between credit information shared and performance.

4.9.2 Moderating effect of regulatory framework on the relationship between demographic information and Performance

The results as shown on Table 4.27 indicate that $R^2=0.015$ without the moderating effects of regulatory framework. However, R^2 increases to 0.122 when the moderator is introduced into the study. This shows that there was a positive change when the moderating variable was included in the model implying that regulatory framework has a positive moderating effect on the relationship between demographic information and Performance. This shows that the role plays a role improving the performance of financial institutions. Analysis of variance results as shown on Table 4.27 shows that the F value= 3.128, $P =0.053$ and since $p>0.05$ we fail to reject the null hypothesis and conclude that there is no significant moderating effect of regulatory framework on the relationship between demographic information and Performance. This shows that the role of government through regulations in improving the performance of financial institutions is not significant.

The co-efficient for regulatory framework is -1.541. This shows that regulatory framework has a negative moderating effect on the relationship between demographic information and performance. This finding is similar with early research by Padilla and Pagano (2000) and Vercammen (1995) on developed credit markets suggests that sharing more detailed information on borrowers' characteristics and/or credit performance can reduce the disciplinary effects of a credit bureau. These studies contend that in an adverse selection setting, the use of default as a bad signal is reduced as banks exchange better information on their clients. When richer information is disclosed, default is no longer a stigma because the riskiness of a borrower can now be inferred from the set of additional characteristics revealed by lenders.

In addition, this suggests that communicating default data and disclosing borrowers' characteristics can have quite different effects on the probability of default. The disciplinary effect arises only from the exchange of default information. If banks also share data on borrowers' characteristics, they actually reduce the disciplinary effect of information sharing: a high- quality borrower will not be concerned about his

default being reported to outside banks if they are also told that he is a high-quality client. But, as discussed above, exchanging information about borrowers' characteristics may reduce adverse selection or temper hold-up problems in credit markets, and thereby reduce default rates (Stenbacka, 2007)

Table 4.27: Regression results of the moderating effect of regulatory framework on the relationship between demographic information and Performance

Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.124 ^a	.015	-.006	2.36480
2	.349 ^b	.122	.083	2.25764

a. Predictors: (Constant), Demographic Information
b. Predictors: (Constant), Demographic Information, Regulatory Framework

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.006	1	4.006	.716	.402 ^b
	Residual	257.244	46	5.592		
	Total	261.250	47			
2	Regression	31.889	2	15.944	3.128	.053 ^c
	Residual	229.361	45	5.097		
	Total	261.250	47			

a. Dependent Variable: Performance of DTMs

b. Predictors: (Constant), Demographic Information

c. Predictors: (Constant), Demographic Information, Regulatory Framework

Coefficient for regulatory framework and demographic information

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.831	.728		23.113	.000
	Demographic Information	.493	.583	.124	.846	.402
2	(Constant)	18.902	1.126		16.790	.000
	Demographic Information	.653	.560	.164	1.165	.250
	Regulatory Framework	-1.541	.659	-.329	-2.339	.024

a. Dependent Variable: Performance of DTMs

4.9.3 Moderating effect of regulatory framework on the relationship between repayment history and Performance

The results shown on Table 4.28 indicate that $R^2=0.379$ without the moderating effects of regulatory framework. However, R^2 increases to 0.396 when the moderator is introduced into the study. This shows that there was a positive change when the moderating variable was included in the model implying that regulatory framework has a positive moderating effect on the relationship between repayment history and performance. Analysis of variance results in Table 4.28 shows F value= 14.723, $P =0.000$ and since $p<0.05$ we reject the null hypothesis and conclude that there is a significant moderating effect of regulatory framework on the relationship between repayment history and performance.

The co-efficient for regulatory framework is -0.633. This shows that regulatory framework has a negative moderating effect on the relationship between repayment history and performance. This finding is similar to Kallberg and Udell (2003) who found out that historical information collected shared had powerful default predictive power. A study by Barron and Staten (2003) showed that lenders could significantly reduce their default rate by including more comprehensive borrower information in their default prediction models. Since lending to risky borrowers is a costly investment, such situations can be avoided with information sharing (Sadoulet, 2006).

Table 4.28: Regression results for the moderating effect of regulatory framework on the relationship between repayment history and Performance

Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.616 ^a	.379	.365	1.87812
2	.629 ^b	.396	.369	1.87331

ANOVA for regulatory framework, repayment history and performance.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	98.992	1	98.992	28.064	.000 ^b
	Residual	162.258	46	3.527		
	Total	261.250	47			
2	Regression	103.332	2	51.666	14.723	.000 ^c
	Residual	157.918	45	3.509		
	Total	261.250	47			

a. Dependent Variable: Performance of DTMs
b. Predictors: (Constant), Repayment History
c. Predictors: (Constant), Repayment History, Regulatory Framework

Coefficients for Repayment History and Regulatory Framework

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.088	.364		44.204	.000
	Repayment History	.208	.039	.616	5.298	.000
2	(Constant)	17.097	.977		17.496	.000
	Repayment History	.194	.041	.575	4.725	.000
	Regulatory Framework	-.633	.569	-.135	-1.112	.272

a. Dependent Variable: Performance of DTMs

4.9.4 Moderating effect of regulatory framework on the relationship between borrowers current loans and Performance

The results shown by the Table 4.29 indicate that $R^2=0.089$ without the moderating effects of regulatory framework. However, R^2 increases to 0.109 when the moderator is introduced into the study. This shows that there was a positive change when the moderating variable was included in the model implying that regulatory framework has a positive moderating effect on the relationship between borrowers` current loans and performance. Analysis of variance results in Table 4.29 show that, F value= 2.742, P =0.075 and since $p>0.05$ we fail to reject the null hypothesis and conclude that there is no significant moderating effect of regulatory framework on the relationship between borrowers `current loans and performance. The co-efficient for regulatory framework is -0.923. This shows that regulatory framework has a negative moderating effect on the relationship between borrowers `current loans and performance. This finding agrees with Behr and Sonnekalb (2012) in a study on effect of information sharing between lenders on access to credit, cost of credit and loan performance results point to a reduction in access to credit, an increase in the cost of credit, and an improvement in loan performance as a result of the introduction of the credit registry. Minneti (2013) found out that asymmetric information in the credit market increases the frequency of information sharing between lenders significantly hence better performance.

Table 4.29: Regression results for the Moderating effect of regulatory framework on the relationship between borrowers' current loans and Performance

Model summary

Model	R	R Square	Adjusted R Square
1	.298 ^a	.089	.069
2	.330 ^b	.109	.069

ANOVA for regulatory framework, borrowers' current loans and performance.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	23.196	1	23.196	4.482	.040 ^b
	Residual	238.054	46	5.175		
	Total	261.250	47			
2	Regression	28.380	2	14.190	2.742	.075 ^c
	Residual	232.870	45	5.175		
	Total	261.250	47			

a. Dependent Variable: Performance of DTMs

b. Predictors: (Constant), Borrower's current loans

c. Predictors: (Constant), Borrower's current loans , Regulatory Framework

Coefficients for borrowers' current loans and regulatory framework

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	18.002	.442		40.718	.000
	Borrower's current loans	-1.924E-009	.000	-.298	-2.117	.040
2	(Constant)	19.058	1.144		16.656	.000
	Borrower's current loans	-1.033E-009	.000	-.160	-.812	.421
	Regulatory Framework	-.923	.923	-.197	-1.001	.322

a. Dependent Variable: Performance of DTMs

4.9.5 Moderating effect of regulatory framework on the relationship between character information and Performance

The results shown on Table 4.30 indicate that $R^2=0.004$ without the moderating effects of regulatory framework. However, R^2 increases to 0.099 when the moderator is introduced into the study. This shows that there was a positive change when the moderating variable was included in the model implying that regulatory framework has a positive moderating effect on the relationship between character information and performance. Analysis of variance results in Table 4.30 show that F value= 2.469, P =0.096 and since $p>0.05$ we fail to reject the null hypothesis and conclude that there is no significant moderating effect of regulatory framework on the relationship between character information and Performance. The co-efficient for regulatory framework is -1.443; this shows that regulatory framework has a negative moderating effect on the relationship between character information and Performance. This finding is similar to Brown and Zehnder (2007) who found out that sharing credit information can motivate borrowers to repay loans, when they would otherwise defaulted. In addition, the interaction of a borrower with an MFI facilitates the development of individual credit histories which other lenders can then use as creditworthiness signals (Craig, 2006).

Table 4.30: Regression results for the Moderating effect of regulatory framework on the relationship between character information and performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.063 ^a	.004	-.018	2.37840
2	.314 ^b	.099	.059	2.28725

a. Predictors: (Constant), Character Information
b. Predictors: (Constant), Character Information, Regulatory Framework

ANOVA for regulatory framework, character information and performance.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.037	1	1.037	.183	.670 ^b
	Residual	260.213	46	5.657		
	Total	261.250	47			
2	Regression	25.831	2	12.915	2.469	.096 ^c
	Residual	235.419	45	5.232		
	Total	261.250	47			

a. Dependent Variable: Performance of DTMs
b. Predictors: (Constant), Character Information
c. Predictors: (Constant), Character Information, Regulatory Framework

Coefficients for character information and regulatory framework

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	17.484	.427		40.929	.000
	Character Information	-.307	.718	-.063	-.428	.670
2	(Constant)	19.578	1.046		18.717	.000
	Character Information	-.280	.690	-.057	-.406	.687
	Regulatory Framework	-1.443	.663	-.308	-2.177	.035

a. Dependent Variable: Performance of DTMs

4.9.6 Overall Moderating Effect of Regulatory Framework on the Relationship between Credit Information Shared and Performance

One of the goals of this study was also to establish the moderating effects of the regulatory framework on the relationship between credit information shared and performance.

4.9.7 Moderating effect of regulatory framework on the relationship between credit Information shared and Performance

The results shown by on table 4.31 indicate that $R^2=0.380$ without the moderating effects of regulatory framework. However, R^2 increases to 0.405 when the moderator is introduced into the study. This shows that there was a positive change when the moderating variable was included in the model implying that regulatory framework has a positive moderating effect on the relationship between credit information shared and Performance.

Zhang (2011) in a study in China found out that after regulations on credit information were enacted; on average borrowers with external information now enjoy statistically significantly higher loans than those without external information. In comparison to credit availability for borrowers with internal information only, sharing information to other banks does not decrease a bank's willingness to lend. However, on average, borrowers with extra information coming from other financial institutions received a higher credit card line than the group of borrowers whose external information only comes from this bank. The difference stems from the fact that the bank improves its knowledge about borrower quality from this shared positive information. In addition, when the extra positive information of a borrower is shared by other bank to this bank, the extra negative information does not show to be particularly important anymore. They also found out that the existence of external information alters the way the bank utilizes internally produced information. On the one hand, the bank depends less on the intensity of bank-borrowing relationships, when there is external information available. On the other hand, the bank grants more if some internally observed information is confirmed by external information, such as the housing status. Last, they find that the negative impact of balances carried by

borrowers on credit availability becomes less significant with external information available. This suggests that external information partly mitigates informational barriers leading to better lending decisions hence better lender's performance (Zhang, 2011).

Table 4.31: Moderating effect of regulatory framework on the relationship between credit information shared and performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.616 ^a	.380	.322	1.94156
2	.636 ^b	.405	.334	1.92366

a. Predictors: (Constant), Character Information, Borrower's current loans , Demographic Information, Repayment History

b. Predictors: (Constant), Character Information, Borrower's current loans , Demographic Information, Repayment History, Regulatory Framework

Analysis of variance results in table 4.32 shows F value= 5.720, P =0.000 and since $p < 0.05$ we reject the null hypothesis and conclude that there is a significant moderating effect of regulatory framework on the relationship between credit information shared and Performance. This finding is similar to Bustelo (2011) who in a study on integrating microfinance to credit information sharing in Bolivia found out that sharing of credit information is important in predicting future payment behavior. Accessing the credit bureau's information helped lenders keep default rates very low. Sharing credit information allowed microfinance lenders to grow with good customers, avoiding systematic defaulters. This kind of growth is sustainable for lenders and borrowers and it's also significant. From 2005 to 2008, the number of individuals receiving microfinance loans reported more than doubled reaching close to 2 million borrowers after passing of regulations on credit information sharing. That micro-lending growth spurt outpaced the 23% increase seen by regulated institutions over the same period. In addition, the percentage of non-

performing loans for the whole banking system fell over time to just 5.7% in 2008, showing a good performance of the system.

Table 4.32: ANOVA for regulatory framework, credit information shared and performance.

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	99.155	4	24.789	6.576	.000 ^b
	Residual	162.095	43	3.770		
	Total	261.250	47			
2	Regression	105.830	5	21.166	5.720	.000 ^c
	Residual	155.420	42	3.700		
	Total	261.250	47			

- a. Dependent Variable: Performance of DTMs
- b. Predictors: (Constant), Character Information, Borrower`s current loans , Demographic Information, Repayment History
- c. Predictors: (Constant), Character Information, Borrower`s current loans , Demographic Information, Repayment History, Regulatory Framework

The results on table 4.33 show that the co-efficient for regulatory framework is -1.087. This shows that regulatory framework has a negative moderating effect on the relationship between credit information shared and Performance.

Table 4.33: Coefficients for credit information shared and regulatory framework

Model		Unstandardized		Standardized	T	Sig.
		Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	16.121	.792		20.350	.000
	Demographic Information	.006	.491	.001	.012	.991
	Repayment History	.205	.047	.607	4.412	.000
	Borrower`s current loans	-	.000	-.023	-.168	.868
	Character Information	1.465E-010				
		.077	.595	.016	.129	.898
2	(Constant)	17.187	1.116		15.394	.000
	Demographic Information	.180	.504	.045	.357	.723
	Repayment History	.204	.046	.602	4.418	.000
	Borrower`s current loans	9.195E-010	.000	.142	.784	.438
	Character Information	.046	.590	.010	.079	.938
	Regulatory Framework	-1.087	.809	-.232	-1.343	.186

a. Dependent Variable: Performance of DTMs

4.10 Optimal Regression Model

The overall regression results of the study established that from the four independent variables used in the study only two had statistical significance with performance. These are repayment history ($F = 28.064$, $p = 0.000$ implying that $p < 0.05$) and borrowers current loans ($F = 4.482$, $p = 0.040$ implying that $p < 0.05$). Those with no statistical significance were demographic information ($F = 0.716$, $p = 0.402$ implying that $p > 0.05$) and character information ($F = 0.813$, $p = 0.670$ implying that $p > 0.05$) and therefore they were excluded in the final analysis to determine the optimal model.

Table 4.34 presents the regression model of repayment history and borrowers current loans on performance of DTMs. As presented in the table, the coefficient of determination R square is 0.379 at 0.05 significance level. This means that 37.9 % of the variation on DTMs performance is influenced by repayment history and borrowers current loans. Minetti (2009) found out that credit information sharing plays a positive role in improving performance. Their findings indicate that improved screening effects from the system caused the level of portfolio arrears to decline between 1-3 percentage points in the six months after it was successively implemented in each branch office. It was observed even more substantial effects of the system in reducing late monthly payments made by borrowers. A cost-benefit analysis of the credit information system shows that MFI investment in the system generated an estimated internal rate of return to the institution of 96.5%. Moreover, it was found that in a competitive microfinance market, a reduction in the default rate by our point estimate of 1.92 points would lower interest rates in a competitive market by 2.59 percentage points. These positive effects impact by reducing default rates hence improved performance.

Table 4.34: Regression model summary for repayment history and borrowers current loans on performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.616 ^a	.379	.352	1.89829

a. Predictors: (Constant), Borrower`s current loans, Repayment History

Table 4.35 presents the results of Analysis of Variance (ANOVA) on repayment history, borrower`s current loans and performance of DTMs. F value= 13.749, P =0.000 and since $p < 0.05$, the null hypothesis was rejected and therefore concluded that there is a significant relationship between repayment history and borrower`s current loans and the performance of DTMs. We therefore conclude that the independent variables repayment history and borrowers current loans affect the performance of DTMs.

Brown and Zehnder (2007) found empirical evidence that the lending market would collapse in the absence of information sharing. In addition their study showed that sharing information encouraged borrowers to repay their loans by allowing lenders to identify borrowers with a good payment history. The study showed that information sharing institution positively impacted the credit market in the following ways. With the absence of credit information shared, borrowers had a tendency to repay loans only when they planned to maintain their current lending relationship. However, in economies with a credit information institution, borrowers had a higher chance of repaying their loans regardless of whether they were planning to continue their current lending relationship or not. Thus, it can be implied that credit sharing positively impact borrower repayment.

Table 4.35: ANOVA Results for repayment history and borrower’s current loans and performance

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	99.092	2	49.546	13.749	.000 ^b
	Residual	162.158	45	3.604		
	Total	261.250	47			

a. Dependent Variable: Performance of DTMs
b. Predictors: (Constant), Borrower`s current loans , Repayment History

The study further determined the beta coefficients of repayment history and borrowers current loans on performance of DTMs. Table 4.36 shows that the coefficients are; repayment history 0.205 while borrowers` current loans is - 0.00000000001417.

The optimal regression model is therefore;

$$Y = 16.155 + 0.205X_2 - 0.00000000001417X_3 + \varepsilon$$

Empirical work by Brown, Jappelli and Pagano (2007), using firm level panel data in transition economies found that the cost of credit declines as information sharing increases between lenders. This is confirmed by McIntosh and Wydick (2009), empirically found that overall default decreases marginally with credit information sharing. Following the same lines Chen (2010) used cross- country regressions to assess the impact of bank competition and credit information sharing on the efficiency of capital allocation and found that credit information sharing increases bank performance. A study conducted by Kipyegon (2011) relating to credit information sharing and the performance of the banking sector indicated that credit information sharing and the performance of the banking sector are strongly related.

Bustelo (2011) in a study on integrating microfinance to credit information sharing in Bolivia found out that sharing of credit information greatly improved lending operations for microfinance institutions. This is because they could now verify the overall indebtedness of a customer before extending credit. The over-lending that had triggered a crisis was now avoidable because initially they were extending loans to borrowers without knowing if they already had too much debt. MFIs could now perform systematic risk assessments of potential borrowers in addition to making immediate decisions, saving time and costs while improving customer service.

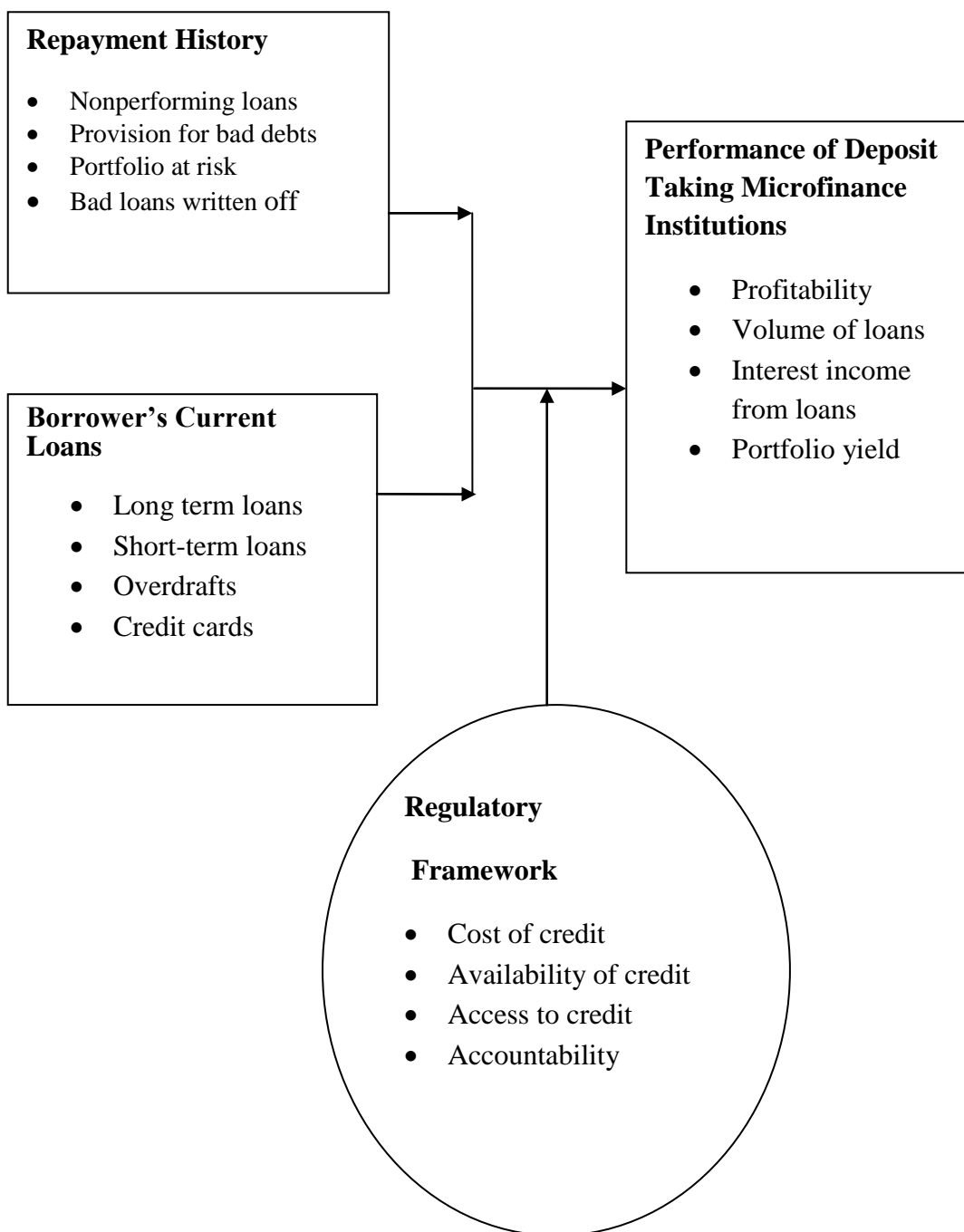
Table 4.36: Coefficients for repayment history and borrower’s current loans.

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error			
1 (Constant)	16.155	.546		29.597	.000
Repayment History	.205	.045	.606	4.589	.000
Borrower’s current loans	-1.417E-010	.000	-.022	-.166	.869

a. Dependent Variable: Performance of DTMs

4.11 Revised Conceptual Framework

From the findings of the study only two independent variables (repayment history and borrower’s current loans) have a significant relationship with the performance of deposit taking microfinance institutions. Figure 5 captures the revised conceptual framework.



Independent Variables

Moderating Variable

Dependent Variable

Figure 4.4: Revised Conceptual Framework

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, conclusions and recommendations of the study. The general objective of this study was to explore the effect of shared entrepreneurs' credit information on the performance of deposit taking microfinance institutions in Kenya.

5.2 Summary of Findings

5.2.1 Effect of demographic information on the performance of deposit taking microfinance institutions in Kenya.

To determine whether there is a relationship that exists between demographic information and performance, Pearson correlation coefficient was determined. A correlation analysis showed that there was a positive relationship between demographic information and performance. This public information allows good borrowers to shop for larger and cheaper loans, thus moving up the credit ladder on the basis of information about their past good behavior. The test of significance showed that there is no significant statistical relationship between demographic information and performance.

5.2.2 Effect of repayment history information on the performance of deposit taking microfinance institutions in Kenya.

In order to determine whether there is a relationship that exist between repayment history and performance, Pearson correlation coefficient was determined. A correlation analysis showed that there was a positive relationship between repayment history and performance. Credit information sharing encourages borrowers to repay their loans since they know that lenders would like to identify borrowers with a good repayment history. The test of significance showed that there is a significant statistical relationship between repayment history information and performance.

5.2.3 Effect of borrower`s current loans information on the performance of deposit taking microfinance institutions in Kenya.

To explore whether there was a relationship that exists between borrower`s current loans and performance, Pearson correlation coefficient was determined. A correlation analysis showed that there was a negative relationship between borrowers` current loans and performance. With credit information sharing, lenders can verify the overall indebtedness of a customer before extending credit. The test of significance showed that there is a significant statistical relationship between current loans information and performance.

5.2.4 Effect of character information of a borrower on the performance of deposit taking microfinance institutions in Kenya.

In order to examine whether a relationship exist between character information and performance pearson correlation coefficient was determined. A correlation analysis shows that there is a negative relationship between character information and performance. Lenders can greatly reduce their default rate by considering more comprehensive borrower information like reputation, experience, honesty and future orientation. The test of significance showed that there is no significant statistical relationship between character information and performance.

5.3 Conclusion

Credit information sharing brings efficiency to lenders. Improved performance by clients opens new opportunities to access more and better loans from others than the lender with whom reputation had been privately earned. In addition, because lender profit cannot decrease from knowing more, lenders want to participate in credit information sharing to learn what the other lender knows although they also fear suffering from the response when the other lender learns. The eventual effect is that DTMs gain more through credit information sharing about customer demographics. The moment lenders start participating in credit information sharing their borrowers improve their repayment behavior. The lending market would collapse in the absence of information sharing and reputational lending. The presence of credit information

sharing reduces the information monopoly of a lender on its borrowers thus making clients appeal to all potential lenders.

The over-lending that brings crisis can be avoided. Now MFIs can perform systematic risk assessments of potential borrowers. This tool offers loan officers the opportunity to make immediate decisions, saving time and costs while improving customer service. Detailed information helps lenders better predict borrower behaviour since historical information shared has powerful predictive power. Ultimately, information sharing about a borrower's character helps in decision making which will result in better credit performance.

5.4 Recommendations

Given that the uptake of credit reports is still low, there is need for the government and all the stakeholders to intensify awareness campaigns about growing need to share information. There is need to broaden the source of information by including utility companies like Kenya power, water companies, land rates collectors among others so as to enrich the available information on prospective borrowers. Moreover, financial institutions volume of credit is increased when some internally observed information is confirmed by external information such as occupation, age, housing status and income.

The government needs to implement favorable monetary policies that will result to cheap credit there by making the cost of borrowing cheaper by entrepreneurs. This initiative will help in reducing the case of non-repayment of loans. Borrowers with good credit records are also able to take advantage of this information sharing to get access to more loans outside their current lenders.

The government through the Central bank and other players in the industry to be carrying out regular seminars or information dissemination forums to educate current and prospective borrowers on the need to apply loans that they have the ability to repay and not to over borrow while taking advantage of the weaknesses of the system. The sharing of credit information enables the borrower to create vital

reputation collateral which provides valuable information to the credit market and a signal of a borrower's individual credit worthiness to a large pool of lenders.

Laws governing credit information sharing in the country should be enhanced and strengthened. Credit providers have a responsibility to: provide information to all licensed CRBs, notify clients of the bureau to which they have submitted their information, issue an adverse action notice to the consumer where an adverse decision has been taken based on information obtained from a CRB, provide accurate information to CRBs, submit and update customer information to the CRB in accordance with the Regulations; and instruct CRBs to delete incorrect information and replace it with correct information. This is key to realizing the gains related to credit information sharing.

5.5 Areas for Further Research

This study only focused on entrepreneurs who have sought financing from deposit taking microfinance institutions. Therefore, there is need to consider entrepreneur`s being served by other financial institutions like banks. The period covered under the study is when only negative entrepreneur`s credit information was being shared. Currently, there is sharing of both positive and negative information hence there is need to consider a study that will investigate the effect of both positive and negative entrepreneur`s information on the performance of financial institutions.

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APPENDICES

Appendix 1: Secondary Information Questionnaire

A) Deposit Taking Microfinance Institution Details

a) Name of Institution -----

B) REPAYMENT HISTORY

Please provide the figures for the following in the years shown below						
Indicator	2008	2009	2010	2011	2012	2013
a. Nonperforming loans(Ksh)						
b. Provision for bad loans (Ksh)						
c. Portfolio at risk(Ksh)						
d. Bad loans written off(Ksh)						

C) BORROWER`S CURRENT LOANS

Please provide the figures for the following in the years shown below						
Indicator	2008	2009	2010	2011	2012	2013
Gross Current loan portfolio(Ksh)						

PERFORMANCE

Please provide the figures of the following in the years shown below						
Indicator	2008	2009	2010	2011	2012	2013
Volume of loans(Ksh)						
Profitability(Net Profit)(Ksh)						
Interest Income from loans(Ksh)						
Portfolio yield						

Appendix 2: Credit Managers Questionnaire

Deposit Taking Microfinance Institution Details

- a) Name of Institution & Branch -----
- b) Area of Operation-----
- c) Number of loan products-----

A) DEMOGRAPHIC INFORMATION

a) Which **gender** is better in terms of loan repayments? (√) (Tick as appropriate)

- a) Men b) Women

b) What is the percentage (%) of clients in the following **DEMOGRAPHIC INFORMATIONS** who have qualified for a loan?

Age	Percentage (%)
Below 20	
21-30	
31-40	
41-50	
Over 50 years	

Please tick (√) in the table the likelihood of a client in the **DEMOGRAPHIC INFORMATIONs** below qualifying for a loan

Age	Most Likely	Moderately likely	likely	None	Unlikely	Moderately unlikely	Most unlikely
Below 20							
21-30							
31-40							
41-50							
Over 50 years							

b) Please tick (√) in the table the likelihood of a client with the following **Marital Status** qualifying for a loan

Marital Status	Most Likely	Moderately likely	likely	None	Unlikely	Moderately unlikely	Most unlikely
Married							
Unmarried							
Divorced							
Widowed							

What percent (%) of clients in the following **Income Brackets** have qualified for a loan?

Income Brackets	Percentage (%)
Ksh	
25,000 and below	
26000-50,000	
51,000-75,000	
76,000-100,000	
100,000 and above	

d) Please tick (√) in the table the likelihood of a client who is in **Business, Formal Employment Or Both** qualifying for a loan

Occupation	Most Likely	Moderately likely	likely	None	Unlikely	Moderately unlikely	Most unlikely
Business							
Formal Employment							
Business & Formal Employment							

CHARACTER INFORMATION

a) Please rank on a scale of 1 is (Most insignificant), 2 is (Moderately insignificant), 3 is (Insignificant), 4 is (None), 5 is (Significant), 6 is (Moderately significant) and 7 is (most significant) the significance of the following character information when it comes to making customer lending decisions.

Character Information	1	2	3	4	5	6	7
Honesty							
Good reputation							
Consistency							
Future oriented							

b) What percentage of clients with the following **Level of Training & Knowledge** has qualified for a loan?

Level of Training & Knowledge	Percentage (%)
Primary school & below	
High school	
Tertiary Training	
University training	

c) Please tick (√) in the table the likelihood of a client with the following **Level of Training & Knowledge** qualifying for a loan

Level of Training & Knowledge	Most Likely	Moderately likely	likely	None	Unlikely	Moderately unlikely	Most unlikely
Primary school & below							
High school							
Tertiary Training							
University training							

d) Please tick in the table the likelihood of a client with the following **Years of Experience** in business or employment qualifying for a loan

Years of experience	Most Likely	Moderately likely	likely	None	Unlikely	Moderately unlikely	Most unlikely
Less than 2							
2-4							
5-6							
7 and above							

D) REGULATORY FRAMEWORK

Please provide the figures of the following in the years shown below						
Indicator	2008	2009	2010	2011	2012	2013
Cost of credit(interest)						
Availability of credit(Total loans)						
Access to credit(number of customers who have qualified for loans)						

Appendix 3: Sampling frame

Deposit Taking Microfinance Institution	Registration Year	Year of Conversion to become a DTM	Number of Credit Managers
Faulu Kenya	1991	June 2009	27
DTM			
KWFT DTM	1981	March 2010	16
Remu DTM	2008	July 2010	3
Uwezo DTM	2007	Nov 2010	2
SMEP DTM	1999	Dec 2010	6
TOTAL			54

Source:CBK,2012