

**EFFECTS OF CREDIT RISK MANAGEMENT PRACTICES ON FINANCIAL
PERFORMANCE OF DEPOSIT TAKING MICROFINANCE INSTITUTIONS IN
KENYA**

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DECLARATION

This project is my original work and to the best of my knowledge it has not been submitted for the award of a degree in any other university.

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This research project has been submitted for examination with my approval as the student's supervisor.

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DEDICATION

This project is dedicated to my parents Josiah and Ruth for instilling the value of education in me and to my son Isaac who I pray that he goes beyond this!

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Many thanks to the Almighty God for seeing me through the entire period. Thanks to my family for their encouragement and support during this entire period. Many thanks to my supervisor James Ng'ang'a for his patience during this entire research period. You gave me the chance to see my best side.

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ABBREVIATIONS

APT -Arbitrage Pricing Theory

DTMI-Deposit Taking Microfinance institutions

MFIs-Microfinance institutions

MDI-Microfinance Deposit Taking Institutions

MPT -Modern Portfolio Theory

CBK-Central Bank of Kenya

CAPM-Capital Asset Pricing Model

RAROC-Risk-Adjusted Return on Capital

VAR-Value at a Risk

ABSTRACT

Deposit Taking Microfinance institutions are not in the business of managing risk and not avoiding it. The future of the banks will undoubtedly rest on risk management dynamics. Credit is the oldest and biggest risk that a bank, by virtue of its very nature of business inherits. To most of the transition economies lending activities have been controversial and a difficult matter. This is because business firms on one hand are complaining about lack of credits and the excessively high standards set by financial institutions, while financial institutions on the other hand have suffered large losses on bad loans. The purpose of this study was to investigate the impact of credit risk management practices on the financial performance of Deposit Taking Microfinance institutions in Kenya.

The study used a descriptive survey approach in collecting data from the respondents. The number of the respondents was 36 staff working in all licensed Deposit taking microfinance institutions in Kenya. From the findings the study concludes that Deposit taking microfinance institutions in Kenya adopted credit risk management practices to counter credit risks they are exposed to and it also concluded that Deposit taking microfinance institutions adopt various approaches in screening and analyzing risk before awarding credit to clients to minimize on loan loss. This included establishing capacity/competition and conditions and use of collateral/security and character of borrower were used in screening and risk analysis in attempt to reduce manages credit risks. The study further concludes that there was a positive relationship between credit risk management practices and the financial performance of Deposit taking microfinance institutions.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Credit risk management is essential to optimizing the performance of financial institutions. Lending has been, and still is, the mainstay of financial institution, and this is more true to emerging economies of developing countries where capital markets are not yet well developed. To most of the transition economies lending activities have been controversial and a difficult matter. This is because business firms on one hand are complaining about lack of credits and the excessively high standards set by financial institutions, while financial institutions on the other hand have suffered large losses on bad loans (Richard, 2006). It has been found out that in order to minimize loan losses and there by improving it financial performance, it is essential for financial institutions to have an effective credit risk management system in place (Basel, 2006). Given the asymmetric information that exists between lenders and borrowers, financial institutions must have a mechanism to ensure that they not only evaluate default risk that is unknown to them ex ante in order to avoid adverse selection, but also that can evolve ex post in order to avoid moral hazards.

An effective system that ensures repayment of loans by borrowers is critical in dealing with asymmetric information problems and in reducing the level of loan losses, thus the long-term success of any banking organization. Considerations that form the basis for sound CRM system include: policy and strategies (guidelines) that clearly outline the scope and allocation of a bank credit facilities and the manner in which a credit portfolio is managed, i.e. how loans are originated, appraised, supervised and collected (Greuning and Bratanovic, 2003). Screening borrowers is an activity that has widely been recommended by, among others, Derban *et al.*

2005). The recommendation has been widely put to use in the banking sector in the form of credit assessment. According to the asymmetric information theory, a collection of reliable information from prospective borrowers becomes critical in accomplishing effective screening.

The assessment of borrowers can be performed through the use of qualitative as well as quantitative techniques. One major challenge of using qualitative models is their subjective nature. However, borrowers attributes assessed through qualitative models can be assigned numbers with the sum of the values compared to a threshold. The technique cannot only minimize processing costs but also reduce subjective judgments and possible biases (Derban *et al.*, 2005). The rating systems if meaningful should signal changes in expected level of loan loss. Brown Bridge, (1998) concluded that quantitative models make it possible to, among others, numerically establish which factors are important in explaining default risk, evaluate the relative degree of importance of the factors, improve the pricing of default risk, be more able to screen out bad loan applicants and be in a better position to calculate any reserve needed to meet expected future loan losses.

Financial institutions are very important in any economy. Their role is similar to that of blood arteries in the human body, because they pump financial resources for economic growth from the depositories to where they are required (Shanmugan and Bourke, 1992). FIs are key providers of financial information to the economy. They play a critical role in emergent economies where borrowers have no access to capital markets. There is evidence that well-functioning financial institutions accelerate economic growth, while poorly functioning Financial Institutions impede economic progress and exacerbate poverty (Barth et al., 2004).

1.1.1 Credit Risk

Credit risk is the most obvious risk to microfinance and other financial institutions by the nature of its activity. In terms of potential losses, it is typically the largest type of risk. The default of a small number of members may result in a very large loss for the microfinance (Bessis 2003). Credit risk is the risk that a borrower defaults and does not honor his or her obligation to service debt. It can occur when the member in microfinance is unable to pay or cannot pay on time. There can be many reasons for default. In most cases, the obligor is in a financially stressed situation and may be facing a bankruptcy procedure. He can also refuse to comply with the debt service obligation, for example in the case of a fraud or a legal dispute.

Credit risk is the potential change in net asset value due to changes in the perceived ability of counterparties to meet their contractual obligations. It occurs when a borrower does not pay back the loan. The definition makes it clear that credit risk arises much earlier than the final failure to pay becomes visible. According to Mwirigi (2006) most financial institutions as early as one month late repayment, a loanee was considered as a defaulter and thus collections efforts were intensified and this explains why micro finance institutions commend low default rates. Those who didn't pay on time, their property was sold to recover the money, followed by write off of the balance and others would consider writing off the balance and allow defaulters to repay the principal only.

1.1.2 Credit Risk Management

Credit risk management is a structured approach to managing uncertainties through risk assessment, developing strategies to manage it, and mitigation of risk using managerial

resources. The strategies include transferring to another party, avoiding the risk, reducing the negative effects of the risk, and accepting some or all of the consequences of a particular risk. The process of risk management is a two step process. The first is to identify the source of the risk, which is to identify the leading variables causing the risk. The second is to devise methods to quantify the risk using mathematical models, in order to understand the risk profile of the instrument.

Once a general framework of risk identification and management is developed, the techniques can be applied to different situations, products, instruments and institutions. It is crucial for banks to have comprehensive risk management framework as there is a growing realization that sustainable growth critically depends on the development of a comprehensive risk management framework (Greuning and Iqbal, 2007).

1.1.3 Financial Performance

Financial performance is a measure of a Bank's policies and operations in monetary terms. It is a general measure of a firm's overall financial health over a given period of time, and can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. There are many different ways to measure a bank's financial performance. This may be reflected in the firm's return on investment, return on assets, value added, among others and is a subjective measure of how a firm can use assets from its primary mode of business and generate revenues.

According to Mishkin (2007), the financial industry, like other industries is in business to earn profits by selling its products. To maximize the profits, financial institutions develop new products to satisfy their own needs as well as those of their customers; in other words,

innovation-which can be extremely beneficial to the economy- is driven by the desire to get (or stay) rich. This view of the innovation process leads to the following simple analysis: A change in the financial environment will stimulate a search by financial institutions for innovations that are likely to be profitable.

Starting in the 1960s, individuals and financial institutions operating financial markets were confronted with drastic changes in the economic environment: inflation and interest rates climbed sharply and became harder to predict, a situation that changed demand conditions in financial markets. The rapid advance in computer technology changed supply conditions. In addition, financial regulations became more and more burdensome. Financial institutions found that many of the old ways of doing business were no longer profitable; the financial services and products they had been offering to the public were no longer selling (McNamee and Selim, 1999). Many financial intermediaries found that they were no longer able to acquire funds with their traditional financial instruments, and without these funds they would soon be out of business. To survive in the new economic environment, financial institutions have to research and develop new products and services that would meet customer needs and prove profitable, a process referred to as financial engineering. The financial innovation that occurs suggests that there are three basic types of financial innovation: responses to changes in demand conditions, responses to changes in supply conditions, and avoidance of regulations (Ball and Shivakumar 2004).

1.1.4 Credit Risk management Practices and Financial Performance

Effective credit risk management involves establishing an appropriate credit risk environment; operating under a sound credit granting process; maintaining an appropriate credit administration

that involves monitoring process as well as adequate controls over credit risk (Basel, 1999). It requires top management to ensure that there are proper and clear guidelines in managing credit risk. All guidelines should be stipulated throughout the organization and everybody involved in credit risk management understand them.

Credit risk arises from non performance by a borrower by either inability or unwillingness to perform in the pre-committed contracted manner. This affects the lender holding the loan contract as well as other lenders to the creditor. Therefore the financial condition of the borrower as well as the current value of any underlying collateral is of considerable interest to its credit union. The deviation of portfolio performance from its expected value result to real credit risks that faces the financial institutions. Credit risk is hard to eliminate but it can be diversified because a portion of the default risk may result from the systematic risk. In addition, the idiosyncratic nature of some portion of these losses remains a problem for creditors in spite of the beneficial effect of diversification on total uncertainty. This is particularly true for credit Unions that lend in local markets and the ones that take highly illiquid assets. In such cases, credit risk is not easily transferred and accurate estimates of loss are difficult to obtain. (IFSB, 2005)

As Deposit taking MFIs continue to grow and expand rapidly, serving more customers and attracting more mainstream investment capital and funds, they need to strengthen their internal capacity to identify and anticipate potential risks to avoid unexpected losses and surprises. Creating a risk management framework and culture within a Deposit taking MFIs is the next step after mastering the fundamentals of individual risks, such as credit risk, treasury risk, and liquidity risk (Altman, 1993). Furthermore clarity about the roles and responsibilities of managers and board members in risk management helps build stronger institutions. A

comprehensive approach to risk management reduces the risk of loss, builds credibility in the marketplace, and creates new opportunities for growth (Berger and Udell 1993)

Empirically, in Kenya, there are about 1,000 microfinance institutions offering poor people loans sometimes as small as \$100 or less. Jamii Bora, the largest such institution in Kenya, has 260,000 members and has lent a total of \$43 million in 10 years. Microfinance institutions offers a wide range of financial products to the poor and uses innovative technology to provide better service as well as managing credit risks. Microcredit was conceived in the 1970s by Muhammad Yunus, the Bangladeshi economist and Nobel laureate. His Grameen Bank is considered the world's first microfinance institution. At Bimas, interest rates on microloans are a manageable due to management of credit risks and attain performance of 17 per cent. Due to management of credit risks facing microfinance institutions, the impoverished often turn to informal money lenders or loan sharks who charge crippling interest rates of up to 100 per cent or more. Repayment rates for microloans are around 90 per cent to 95 per cent. As a development tool, experts say microcredit is much more sustainable than handing out money or aid because it empowers people while giving them a sense of responsibility and performs better due to better adoption of credit risk management practices (Altman, 1993).

MFIs have developed very effective lending methodologies that reduce the credit risk associated with lending to microenterprises, including group lending, cross guarantees, stepped lending, and peer monitoring (Drzik, 1995). Other key issues that affect Deposit taking MFIs s' credit risk includes portfolio diversification, issuing larger individual loans, and limiting exposure to certain sectors (agricultural or seasonal loans). Each type of lending has a different risk profile and requires unique loan structures and underwriting guidelines .Effective approaches to managing credit risk in Deposit taking MFIs have been developed in microfinance institutions. This

includes well-designed borrower screening, careful loan structuring, close monitoring, clear collection procedures, and active oversight by senior management. Delinquency is understood and addressed promptly to avoid its rapid spread and potential for significant loss. To reduce the probability of a down-side risk. These are introduced before a risk occurs. Reducing the probability of an adverse risk increases people's expected income and reduces income variance and both effects increase welfare (Fallon, 1996).

These include policies regarding sound macroeconomics, public health, the environment, and education and training. Preventive SP interventions are typically linked to measures to reduce the risks in the labor market, notably the risk of UN- or under P employment or low wages due to inappropriate skills or poorly functioning labor markets. They are concerned with labor standards and the (mal-) functioning of the labor market, resulting from skill-mismatch, bad labor market regulations, or other distortions. With reduction strategies, mitigation strategies are also employed before the risk occurs. Whereas preventive strategies reduce the probability of the risk occurring, mitigation strategies reduce the potential impact if the risk were to occur. Risk mitigation can take several forms. Portfolio diversification reduces the variability (Harrington and Niehaus G1999)

1.1.5 Deposit Taking Microfinance Institution in Kenya

The enactment or endorsement of Microfinance deposit taking institutions Act (MDI ACT) by the parliament of Microfinance Act 2006 gave birth to Microfinance Deposit Taking Institutions (MDIs) which are allowed to mobilize and intermediate savings from the depositors (Mutua 2003). Microfinance institutions (MFIs) world over have been identified as critical institutions to nations quest for solutions to the development challenge (CGAP, 2002). An effort to modernize

and uplift operations of microfinance institutions gives rise to Microfinance Deposit Taking Institutions (MDIs) which are regulated under MDI Act 2006 by Central Bank of Kenya (CBK, 2006). According to ADB (2000) and Otero and Maria (2002), the implementation of the policy was deemed important for savings mobilization and proper management of public deposits by implementing basic minimum level of prudential regulations. Mutua, (2003) argues that prudential requirements enable MDIs to manage resources properly which ultimately improves the efficiency and loan costs.

The Microfinance Act 2006 of Kenya, seeking to streamline the operation of the MFIs in Kenya, addresses licensing provisions, minimum capital requirements and minimum liquid assets, submission of accounts to the Central Bank, supervision by the Central Bank, and limits on loan and credit facilities. The licensed MFIs called the deposit taking MFIs are licensed MFIs to accept public funds and Contributes to poverty alleviation and at the same time comply with the requirements of financial sector safety and soundness. The Deposit taking MFIs are regulated under the Bill to provide savings, credit, and other financial services to MSEs and to low-income households in both rural and urban areas.

Greater access to, and sustainable flow of financial services, particularly credit, to the low-income households and MSEs is critical to poverty alleviation. Therefore, an appropriate policy, legal and regulatory framework to promote a viable and sustainable system of microfinance in the country has been developed via the proposed Deposit Taking Micro Finance. There are six Deposit Taking MFIs which include Faulu Kenya DTM Limited, Kenya Women Finance Trust DTM Limited (now Kenya Women Holdings Limited) REMU DTMLimited, SMEP DTM Limited, UWEZO DTM Limited and Rafiki DTM Limited. All these DTMs have their Headquarters in Nairobi.

1.2 Statement of the Problem

Granting credit to the microfinance institution members is an important activity and therefore it is importance to manage credit risks facing the microfinance institutions, coupled with taking necessary measures to reduce loan defaulters which at the same time advancing credit in a fair and undiscriminating manner so as to continue offering service to their members. Weak credit risk management is a primary cause of many business (particularly small business) failures). National credit Unions that failed in the mid 1980s in the U.S.A and found out that the consistent element in the failures was the inadequacy of the bank's management system for controlling loan quality ((Parrenas, 2005).

Strong risk management practices can help Deposit Taking MFIs reduce their exposure to credit risks, and enhance their ability to compete in the market with other well established financial institutions like credit Unions (Iqbal and Mirakhor, 2007). The micro finance institutions adopt various credit risks management practices in managing credit. in Bangladesh a microfinance institution called Grameen Bank has manage credit risk and at the end of 2000 reported 2.4 million members, where 95 percent of them are women, with \$225 million outstanding loan. In Thailand also has reported impressive outreach through agricultural lending by the Bank for Agriculture and Agricultural Cooperative (Meyer, 2002). In general, a lot number of microfinance institutions have registered impressive outreach in several developing economies including India, Cambodia, and others which result to improved performance of the instituion (Meyer, 2002). The wide variety of performance in microfinance institutions is released due to credit risk management adopted by the organization. Large-sample studies of the industry have documented the existence of profits) and a positive link between MFI performance and good macroeconomic conditions (Altman and Narayanan, 1998).

The researcher identified few local studies on credit risk management practices and especially focusing on Saving Credit and Cooperative Society. They include; Kimeu (2008) who studied credit risk management techniques of unsecured credit Unions loans of commercial credit Unions in Kenya, Ngare (2008) who studied credit risk management practices by commercial credit Unions and found that credit risk management has impact on performance of commercial credit Unions, Simiyu (2008) studied techniques of credit risk management in microfinance institutions in Kenya, Mutwiri (2007) studied credit risk management practices by oil companies in Kenya and found that credit risk management practices in microfinance improve firm performance Muteru (2007) indicated that credit risk management practices impacted positively on performance of Pharmaceuticals manufacturing firms in Kenya. Muturi (2010) conducted a study on effects on Credit risk management practices on microfinance institutions in general on financial performance. None of this study has focus on Deposit taking microfinance institutions which are allowed to mobilize and intermediate savings from the depositors. To the researchers knowledge there is no known study done on impact of credit risk management practices on performance of Deposit Taking microfinance institutions in Kenya, much of the work done relating to credit risk management practices on financial performance of microfinance institutions has been conducted in the developed world. This study seeks to fill this gap of knowledge by investigating the impact of credit risk management practices on financial performance of Deposit Taking MFIs in Kenya.

1.3 Objectives of the Study

The objectives of the study are:

- i. To identify the credit risk management practices adopted Deposit Taking MFIs in Kenya

- ii. To determine the impact of credit risk management practices on financial performance of Microfinance Institutions in Kenya

1.4 Significance of the Study

The micro finance institutions will benefit from the study as they will gain knowledge on impact of credit risk management on performance of Microfinance Institutions. The study will present varied practices which can be shared by many Microfinance Institutions in the industry.

The study will be of great importance to the government through the regulatory agency as it would help in designing policy pertaining to the lending of Deposit Taking MFIs in the country. Finally, the study would contribute to the broader realm of business and academic research. In business, through its recommendations, the study would add value to better credit management practices in businesses and service quality. In academia, the studies will be significant to academic research in the broader area of credit risk management practices and provide a foundation for future studies.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature review on the credit. It summarizes the information from other researchers who have carried out their research in the same field of study. The chapter presents theoretical background, credit risk models, the empirical review, conceptualization, operationalization and the research gap.

2.2 Theoretical Orientation

2.2.1 Theory of Finance

The theory of finance is concerned with how individuals and firms allocate resources through time. In particular, it seeks to explain how solutions to the problems faced in allocating resources through time are facilitated by the existence of capital markets (which provide a means for individual economic agents to exchange resources to be available at different points in time) and of firms (which, by their production-investment decisions, provide a means for individuals to transform current resources physically into resources to be available in the future). Numerous economists have explained the role of finance in the market with the help of different finance theories. The concept of finance theory involves studying the various ways by which businesses and individuals raise money, as well as how money is allocated to projects while considering the risk factors associated with them.

The concept of finance also includes the study of money and other assets, managing and profiling project risks, control and management of assets, and the science of managing money.

2.2.2 Portfolio Theory to Credit Risk Management

Since the 1980s, credit Unions have successfully applied modern portfolio theory (MPT) to market risk. Many credit Unions are now using value at risk (VAR) models to manage their interest rate and market risk exposures. Unfortunately, however, even though credit risk remains the largest risk facing most credit Unions, the practical of MPT to credit risk has lagged (William Margrabe, 2007).

Credit Unions recognize how credit concentrations can adversely impact financial performance. As a result, a number of sophisticated institutions are actively pursuing quantitative approaches to credit risk measurement, while data problems remain an obstacle. This industry is also making significant progress toward developing tools that measure credit risk in a portfolio context. They are also using credit derivatives to transfer risk efficiently while preserving customer relationships. The combination of these two developments has precipitated vastly accelerated progress in managing credit risk in a portfolio context over the past several years.

2.2.3 Asset-by-asset Approach

Traditionally, credit Unions have taken an asset-by-asset approach to credit risk management. While each bank's method varies, in general this approach involves periodically evaluating the credit quality of loans and other credit exposures, applying a credit risk rating, and aggregating the results of this analysis to identify a portfolio's expected losses. The foundation of the asset-by-asset approach is a sound loan review and internal credit risk rating system. A loan review and credit risk rating system enable management to identify changes in individual credits, or portfolio trends in a timely manner. Based on the results of its problem loan identification, loan

review, and credit risk rating system management can make necessary modifications to portfolio strategies or increase the supervision of credits in a timely manner.

2.2.4 Portfolio Approach

While the asset-by-asset approach is a critical component to managing credit risk, it does not provide a complete view of portfolio credit risk, where the term risk refers to the possibility that actual losses exceed expected losses. Therefore to gain greater insight into credit risk, credit Unions increasingly look to complement the asset-by-asset approach with a quantitative portfolio review using a credit model.

Credit Unions increasingly attempt to address the inability of the asset-by-asset approach to measure unexpected losses sufficiently by pursuing a portfolio approach. One weakness with the asset-by-asset approach is that it has difficulty identifying and measuring concentration. Concentration risk refers to additional portfolio risk resulting from increased exposure to a borrower, or to a group of correlated borrowers. Table 2.1 summarizes strategies for reducing and coping with portfolio credit risk.

2.2.5 Pricing Theory

This theory subscribes to the fact that an estimate of the benefits of diversification would require that practitioners calculate the covariance of returns between every pair of assets. In their Capital Asset Pricing Model (CAPM), William Sharpe (1961, 1964) and John Lintner (1965) solved this practical difficulty by demonstrating that one could achieve the same result merely by calculating the covariance of every asset with respect to a general market index. With the

necessary calculating power reduced to computing these far fewer terms (betas), optimal portfolio selection became computationally feasible.

A more interesting alternative was the Arbitrage Pricing Theory (APT) of Stephen A. Ross (1976). Stephen Ross's APT approach moved away from the risk vs. return logic of the CAPM, and exploited the notion of pricing by arbitrage to its fullest possible extent. As Ross himself has noted, arbitrage-theoretic reasoning is not unique to his particular theory but is in fact the underlying logic and methodology of virtually all of finance theory.

2.3 Credit Risk Models

Over the last decade, a number of the world's largest credit Unions have developed sophisticated systems in an attempt to model the credit risk arising from important aspects of their business lines. Such models are intended to aid credit Unions in quantifying, aggregating and managing risk across geographical and product lines. The outputs of these models also play increasingly important roles in credit Unions' risk management and performance measurement processes, including performance-based compensation, customer profitability analysis, risk-based pricing and, to a lesser (but growing) degree, active portfolio management and capital structure decisions. Credit risk modeling may indeed prove to result in better internal risk management, and may have the potential to be used in the supervisory oversight of banking organizations. However, before a portfolio modeling approach could be used in the formal process of setting regulatory capital requirements for credit risk, regulators would have to be confident not only that models are being used to actively manage risk, but also that they are conceptually sound, empirically validated, and produce capital requirements that are comparable across institutions. At this time, significant hurdles, principally concerning data availability and model validation,

still need to be cleared before these objectives can be met (BIS, credit risk modeling, 19th April 1999). Credit scoring models use data on observed borrower characteristics either to calculate the probability of default or to borrowers into different default risk classes (Saunders and Cornett, 2007).

2.3.1 Altman's Z-Score

The Z-score formula for predicting Insolvency of Altman (1968) is a multivariate formula for measurement of the financial health of a company and a powerful diagnostic tool that forecast the probability of a company entering insolvency within a two year period with a proven accuracy of 75-80%.

The Altman's credit scoring model takes the following form;

$$Z=1.2X1+ 1.4X2 + 3.3X3 + 0.6X4 +1.0X5..... (1)$$

Where, X1 = Working capital/ Total assets ratio

X2 = Retained earnings/ Total assets ratio

X3 = Earnings before interest and taxes/ Total assets ratio

X4 = Market value of equity/ Book value of long-term debt ratio

X5 = Sales/ Total assets ratio.

The higher the value of Z, the lower the borrower's default risk classification. According to Altman's credit scoring model, any firm with a Z-Score less than 1.81 should be considered a high default risk, between 1.81-2.99 an indeterminate default risk, and greater than 2.99 a low default risk.

Critics: Use of this model is criticized for discriminating only among three borrower behavior; high, indeterminate, and low default risk. Secondly, that there is no obvious economic reason to expect that the weights in the Z-Score model – or, more generally, the weights in any credit-scoring model- will be constant over any but very short periods. Thirdly the problem is that these models ignore important, hard to quantify factors (such as macroeconomic factors) that may play a crucial role in the default or no-default decision.

2.3.2 KMV credit Monitor Model

In recent years, following the pioneering work on options by Merton, Black, and Scholes, recognition can now be made that when a firm raises funds either by issuing bonds or by increasing bank loans, it holds a very valuable default or repayment option (Black and Scholes, 1973) and (Merton, 1974). The KMV Model is a credit monitor model that helps to solve the lending problems of credit Unions and further look at the repayment incentive problem (Gilbert, 2004). To try resolving the problems, the KMV Model uses the structural relationship between the volatility of a firm's asset and the volatility of the firm's equity.

The KMV Corporation (purchased by Moody's in 2002) has turned this relatively simple idea into a credit-monitoring model now used by most of the large US credit Unions to determine the Expected Default Frequency (EDF) that is the probability of default of large corporations (KMV Corporation, 1994).

The expected default frequency that is calculated reflects the probability that the market value of the firm's assets will fall below the promised repayments on debt liabilities in one year. If the value of a firm's assets falls below its debt liabilities, it can be viewed as being economically insolvent. Simulations by the KMV have shown that this model outperforms both accounting-

based models and S&P ratings (Saunders and Cornett, 2007). The relevant net worth of a firm is therefore the market value of the firm's assets minus the firm's default point.

$$\text{Net worth} = (\text{Market Value of Assets}) - (\text{Default Point}) \dots\dots\dots (2)$$

A firm will default when its market net worth reaches zero.

$$\text{Distant to Default} = \frac{(\text{Market Value of Assets})}{(\text{Asset Volatility})} - (\text{Default Point}) \dots\dots\dots (3)$$

(Source: Moody's KMV; Modeling Default Risk, 18th December 2003.)

The KMV's empirical EDF is an overall statistics that can be calculated for every possible distance to default (DD) using data either aggregated or segmented by industry or region. To find the EDF for any particular firm at any point in time, one must look at the firm's EDF as implied by its calculated DD. As a firm's DD fluctuates, so do its EDF. For firm's that are actively traded, it would be possible in theory to update the EDF every few minutes (Gilbert, 2004).

Critics: The KMV EDF Model has been criticized on the basis that they are not true probabilities of default. This is reflected in the poor results obtained using KMV empirical EDFs in order to replicate risky bond prices (Kao, Eom et al, 2000).

2.3.3 Risk-Adjusted Return on Capital (RAROC) Model

An increasingly popular model used to evaluate the return on a loan to a large customer is the Risk-Adjusted Return on Capital (RAROC) Model. This model, originally pioneered by

Bankers Trust (acquired by Deutsche Bank in 1998) is now adopted by virtually all the large credit Unions in Europe and the US, although with some differences among them (Saunders and Cornett, 2007). The essential idea behind RAROC is that rather than evaluating the actual promised annual cash flow on a loan as a percentage of the amount lent or (ROA), the lenders balance the loan's expected income against the loan's expected risk.

The RAROC Model is basically represented by,

$$\text{RAROC} = (\text{one year net income on loan}) / (\text{Risk adjusted assets}) \dots\dots\dots (4)$$

For denominator of RAROC, duration approach can be used to estimate worst case loss in value of the loan:

$$DL_n = -DL_n \times L_n \times (DR / (1+R)) \dots\dots\dots (5)$$

Where, DR is an estimate of the worst change in credit risk premiums for the loan class over the past year.

L_n = Loan

DL_n = Change in loan class

R = Interest Rate

According to James Christopher (1996), the immediate purpose of the RAROC risk measurement systems is to provide bank managements with a more reliable way to determine the

amount of capital necessary to support each of their major activities and, thus, to determine the overall leverage for the bank as a whole. This paper also stipulates that the RAROC system provide a uniform measure of performance and that management can, in turn use this measure to evaluate performance for capital budgeting and as an input to the compensation system used for senior managers.

2.3.4 Value at a Risk (VAR) Model

This is a model used to estimate the probability of portfolio losses based on the statistical analysis of historical price trends and volatilities.

Value at risk is commonly used by credit Unions, security firms and companies that are involved in trading energy and other commodities. VAR is able to measure risk while it happens and is an important consideration when firms make trading or hedging decision (Simon and Robert, 2001).

Some people have described VAR as the "**new science of risk management**", but one does not need to be a scientist to use VAR. Here, a look at the idea behind VAR and the three basic methods of calculating it is expounded. Basically, VAR is represented by;

$$\text{VAR} = (\text{dollar value of position}) (\text{price sensitivity}) (\text{potential adverse move in price/yield}).$$

..... (6)

For financial institutions, risk is about the odds of losing money given out as loans, and VAR is based on that common-sense fact. By assuming financial institutions care about the odds of a really big loss on loans, VAR answers the question, "What is my worst casescenario?" or "How much could I lose in a really bad month?"

To be more specific, a VAR statistic has three components: a time period, a confidence level and a loss amount (or loss percentage). The following are examples of variations of the questions that VAR attempts to answer:

- What is the most I can expect to lose in default on loan repayment over the next month with a 95% or 99% level of confidence?
- What is the maximum percentage I can expect to lose over the next year with 95% or 99% confidence?

It can be seen how the "VAR question" has three elements: a relatively high level of confidence (typically either 95% or 99%), a time period (a day, a month or a year) and an estimate of loss on loan default (expressed either in dollar or percentage terms) (David Harper, 2008).

2.4.1 Loan Portfolio and Credit Risk Management

When a company grants credit to its customers, it incurs the risk of non-payment. Credit management, or more precisely credit risk management, refers to the systems, procedures and controls which a company has in place to ensure the efficient collection of customer payments so as to minimize the risk of non-payment, (Naceur and Goaid, 2003).

Credit risk management forms a key part of a company's overall risk management strategy. Weak credit risk management is a primary cause of many business failures. Many small businesses, for example, have neither the resources nor the expertise to operate a sound credit management system (Richardson, 2002).

The largest source of risk for any financial institution resides in its loan portfolio. Loan portfolio is ideally expected to be the bank's largest asset. It should also be noted that since most credit Unions financing is not supported by bankable collateral, the quality of the loan portfolio is absolutely crucial. Three accounting ratios are used to measure portfolio quality including: Portfolio at risk (PAR) which measures the portion of the loan portfolio contaminated by arrears as a percentage of the total portfolio where the desired level is less than 10 per cent; Risk coverage ratio which shows what proportion of the portfolio at risk is covered by actual loan losses where the rate could be as high as 90 per cent (Jansson, 2002) and Loans written off ratio which represents the amount of loans removed from the accounting books because of a substantial loss where a maximum of 4 per cent is envisaged (Saltzman and Salinger, 1998).

Profitability indicators are used to gauge the schemes' net income in relation to the structure of its balance sheet. These indicators provide an indication of whether a bank is earning an adequate return on the funds invested on the institution. This performance indicator is also linked with portfolio quality and efficiency indicators. Banking institution's capital can be seen in two ways. Narrowly, it can be seen as the amount contributed by the owners of the institution (paid-up share capital) that gives them the right to enjoy all the future earnings of the bank.

More comprehensively, it can be seen as the amount of owners' funds available to support a bank's business (Athanasoglou et al., 2005). The later definition includes reserves, and is also termed total shareholders' funds. No matter the definition adopted, a bank's capital is widely used to analyze the status of its financial strength (Bobáková, 2003).

Positive correlation between returns and capital has been demonstrated by Furlong and Keeley (1989), Naceur (2003) and Kwan and Eisenbeis (2005). Investigating the determinants of credit

Unions' performances during the period 1980-1995, Naceur and Goaid (2003) indicated that the best performing credit Unions are those who have struggled to improve labour and capital productivity and those who have been able to reinforce their equity. Naceur (2003) agree that well-capitalized credit Unions face lower need to external funding and lower insolvency and funding costs; and this advantage translates into better profitability. Therefore, researchers widely posit that the more capital a financial institution has, the more resistant it will be to.

If portfolio quality is poor or efficiency is low for example, this is reflected in profitability. Profitability is measured using three ratios: Return on assets which provide an overall measure of profitability by assessing of net income to average total assets whereby the desired level is around 3.7 per cent for smaller credit Unions in the developing countries (Jansson, 2002). Financial self sufficiency measures the total income as a ratio of adjusted operating expenses. The total expenditure is adjusted for inflation costs, market interest rates for donated capital and all in-kind subsidies and donations. Portfolio yield measures the total loan income to average net loan portfolio. The targeted level for this ratio is at least 10 per cent (Richardson, 2002).

2.4.2 Risk Identification

The first step in organizing the implementation of the risk management function is to establish the crucial observation areas inside and outside the corporation (Kromschroder and Luck, 1998). Then, the departments and the employees must be assigned with responsibilities to identify specific risks. For instance, interest rate risks or foreign exchange risks are the main domain of the financial department.

Peters et al. (1989) described the development of a conceptual model of how auditors assess inherent risk in a normal audit environment and its implementation as a knowledge-based

(expert) system. Peters et al. (1989) asserted that the auditor begins the inherent risk evaluation process by generating expectations of accounts balances. The auditor identifies changes that have occurred in the firm or its environment and determines how those changes should interact with historic trends to produce an expected balance in the account (1989, p. 365). Consistent with Hylas and Ashton (1982) and Houghton and Fogarty (1991), Peters et al.'s conceptual model included both historical firm data and the historic evaluation of management and control as essential factors contributing to the auditor's assessment of inherent risk. It is important to ensure that the risk management function is established throughout the whole corporation; apart from parent company, the subsidiaries too have to identify risks, analyze risks and so on. There are many other approaches for risk identification, for instance, scenario analysis or risk mapping. An organization can identify the frequency and severity of the risks through risk mapping which could assist the organization to stay away from high frequency and low severity risks and instead focus more on the low frequency and high severity risk. Risk identification process includes risk-ranking components where these ranking are usually based on impact, severity or dollar effects (Barton et al. 2002). Accordingly, the analysis helps to sort risk according to their importance and assists the management to develop risk management strategy to allocate resources efficiently.

The techniques of risk identification are facilitative tools, intended to maximize the opportunity of identifying all the risks or hazards inherent in a particular facility, system, or product. The tools may be categorized under the broad headings of intuitive, inductive and deductive techniques.

2.4.3 Risk Analysis and Assessment

Notwithstanding the report title, Risk: Analysis, Perception and Management, the working definitions employed by the Royal Society Study Group (1992) do not include the term risk analysis. According to the study group, risk estimation comprises identification of the outcomes and estimation of both the magnitude of the consequences and the probability of those outcomes. The addition of risk evaluation completes the process of risk assessment. British Standard 4778 considers risk assessment to refer to analysis of inherent risks and their significance in an appropriate context. It therefore seems possible at this stage to conclude that risk assessment and risk analysis are synonymous terms.

Strutt (1993a) outlines an engineering approach which defines risk analysis in the same terms as the Royal Society Study Group defines risk estimation and indeed claims that risk analysis is also called risk estimation. This is a narrower definition which now suggests that the preliminary conclusion above is mistaken. However, in another paper (Strutt, 1993), the same author expands his definition of risk analysis to include evaluation of acceptance or tolerance to the risk.

Strutt (1993c) gives the fullest definition of risk analysis in a third paper where he sets out the concept in seven stages as systematic assessment (item by item - question every part of the system), identification of risks (local and global scale), assessment of risks (frequencies and consequences). This may involve a number of different analyses like establishing acceptable or tolerable levels of risk, evaluation of risks, determine whether the risks are as low as reasonably practicable, and determine risk reduction measures where appropriate.

A comprehensive risk measurement and mitigation methods for various risk arising from financing activities and from the nature of profit and loss sharing in the source of funds

especially investment account holders are explained by Sundararajan (2007). He concludes that the application of modern approaches to risk measurement, particularly for credit and overall banking risks is important for credit Unions. Also, he suggests that the need to adopt new measurement approaches is particularly critical for credit Unions because of the role play, the unique mix of risks in finance contracts.

Risk analysis now goes beyond evaluation to include some of the decision making processes of risk management. Brainstorming is the main intuitive technique, involving a group generating ideas off the top of their heads with a philosophy of nobody is wrong - let's get the ideas on the board. Although quick and simple, it lacks the comprehensive approaches of the more sophisticated techniques.

2.4.4 Risk Monitoring

Effective risk management requires a reporting and review structure to ensure that risks are effectively identified and assessed and that appropriate controls and responses are in place (IRM, AIRMIC and ALARM; 2002). Risk monitoring can be used to make sure that risk management practices are in line and proper risk monitoring also helps bank management to discover mistake at early stage (Al-Tamimi and Al-Mazrooei, 2007). Monitoring is the last step in the corporate risk management process (Pausenberger and Nassauer, 2002).

According to Parrenas, (2005), the shareholders of the institutions can use their rights to demand information in order to judge the efficiency of the risk management system. The director's report enables the shareholders to assess the status of the corporation knowledgeably and thoroughly. Khan and Ahmad (2001) conducted a survey of risk management practices and found that on average the lowest percentage is on the measuring, mitigating and monitoring risk that is 69%

score as compared to risk management policies and procedures that is 82.4%, and internal control of credit Unions that is 76%. Al-Tamimi and Al-Mazrooei (2007) found that there is significant difference between UAE national and foreign credit Unions in risk monitoring and controlling. Also, the UAE commercial credit Unions have an efficient risk monitoring and controlling system and it has positive influence on risk management practices.

According to Baldoni, (1998), the area of interest rate risk is the second area of major concern and on-going risk monitoring and management. Here, however, the tradition has been for the banking industry to diverge somewhat from other parts of the financial sector in their treatment of interest rate risk. Most commercial credit Unions make a clear distinction between their trading activity and their balance sheet interest rate exposure. Investment credit Unions generally have viewed interest rate risk as a classic part of market risk, and have developed elaborate trading risk management systems to measure and monitor exposure. For large commercial credit Unions and European-type universal credit Unions that have an active trading business, such systems have become a required part of the infrastructure, (Akkizidis and Khandelwal, 2008). But, in fact, these trading risk management systems vary substantially from bank to bank and generally are less real than imagined. In many firms, fancy value-at-risk models, are up and running. But, in many more cases, they are still in the implementation phase. In the interim, simple ad hoc limits and close monitoring substitute for elaborate real time systems. While this may be completely satisfactory for institutions that have little trading activity and work primarily on behalf of clients, the absence of adequate trading systems elsewhere in the industry is a bit distressing.

2.5 Credit Risk Management Procedures

According to Fallon, (1996), each bank must apply a consistent evaluation and rating scheme to all its investment opportunities in order for credit decisions to be made in a consistent manner and for the resultant aggregate reporting of credit risk exposure to be meaningful. To facilitate this, a substantial degree of standardization of process and documentation is required. This has led to standardized ratings across borrowers and a credit portfolio report that presents meaningful information on the overall quality of the credit portfolio. In a single rating system, a single value is given to each loan, which relates to the borrower's underlying credit quality.

At some institutions, a dual system is in place where both the borrower and the credit facility are rated. In the latter, attention centers on collateral and covenants, while in the former, the general credit worthiness of the borrower is measured. Some credit Unions prefer such a dual system, while others argue that it obscures the issue of recovery to separate the facility from the borrower in such a manner. Parrenas, (2005) hold that such an approach, whether it is a single or a dual rating system allows the credit committee some comfort in its knowledge of loan asset quality at any moment of time. It requires only that new loan officers be introduced to the system of loan ratings, through training and apprenticeship to achieve a standardization of ratings throughout the bank. Given these standards, the bank can report the quality of its loan portfolio at any time, along the lines of the report presented.

According to Luck, (1998), total receivables, including loans, leases and commitments and derivatives, are reported in a single format. Assuming the adherence to standards, the entirety of the firm's credit quality is reported to senior management monthly via this reporting mechanism. Changes in this report from one period to another occur for two reasons, loans have entered or

exited the system, or the rating of individual loans has changed over the intervening time interval. The first reason is associated with standard loan turnover. Loans are repaid and new loans are made. The second cause for a change in the credit quality report is more substantive.

Variations over time indicate changes in loan quality and expected loan losses from the credit portfolio. In fact, credit quality reports should signal changes in expected loan losses, if the rating system is meaningful. Studies by Harrington, (1999) on their rating system have illustrated the relationship between credit rating and ex post default rates. A similar result should be expected from internal bank-rating schemes of this type as well. However, the lack of available industry data to do an appropriate aggregate migration study does not permit the industry the same degree of confidence in their expected loss calculations.

For credit quality report to be meaningful, all credits must be monitored, and reviewed periodically. It is, in fact, standard for all credits above some dollar volume to be reviewed on a quarterly or annual basis to ensure the accuracy of the rating associated with the lending facility. In addition, a material change in the conditions associated either with the borrower or the facility itself, such as a change in the value of collateral, will trigger a re-evaluation. This process, therefore, results in a periodic but timely report card on the quality of the credit portfolio and its change from month to month (Haron and Hock, 2007). Generally accepted accounting principles require this monitoring. The credit portfolio is subject to fair value accounting standards, which have recently been tightened by The Financial Accounting Standards Board (FASB). Commercial credit Unions are required to have a loan loss reserve account which accurately represents the diminution in market value from known or estimated credit losses (IFSB, 2005).

As an industry, credit Unions have generally sought estimates of expected loss using a two-step process, including default probability, and an estimate of loss given default. This approach parallels the work of Harrington, (1999) referred to above. At least quarterly, the level of the reserve account is re-assessed, given the evidence of loss exposure driven directly from the credit quality report, and internal studies of loan migration through various quality ratings. Absent from the discussion thus far is any analysis of systematic risk contained in the portfolio. Traditionally mutual funds and merchant credit Unions have concerned themselves with such risk exposure, but the commercial banking sector has not. This appears to be changing in light of the recent substantial losses in real estate and similar losses in the not-too-distant past in petrochemicals (Grais, and Kulathunga, 2007).

According to Fuser et al, (1998), many credit Unions are beginning to develop concentration reports, indicating industry composition of the loan portfolio. This process was initially hampered by the lack of a simple industry index. Codes were employed at some institutions, but most found them unsatisfactory. Reports such an industry grouping to illustrate the kind of concentration reports that are emerging as standard in the banking industry. For the investment management community, concentrations are generally benchmarked against some market indexes, and mutual funds will generally report not only the absolute percentage of their industry concentration, but also their positions relative to the broad market indexes. Unfortunately, there is no comparable benchmark for the loan portfolio. Accordingly, firms must weigh the pros and cons of specialization and concentration by industry group and establish subjective limits on their overall exposure (Fuser et al, 1998).

Nonetheless, such a relationship report is required to capture the disparate activity from many parts of the bank. Transaction with affiliated firms needs to be aggregated and maintained in

close to real time. Each different lending facility is reported. In addition, the existing lines of credit, both used and open, need to be reported as well. Generally, this type of credit risk exposure or concentration report has both an upper and lower cut-off value so that only concentrations above a minimum size are recorded, and no one credit exposure exceeds its predetermined limit. The latter, an example of the second technique of risk management is monitored and set by the credit committee for the relationship as a whole (Barton et al, 2002).

For institutions that do have active trading businesses, value-at-risk has become the standard approach. Similar systems are in place at other firms. In that much exists in the public record about these systems, there is little value to reviewing this technique here. Suffice it to say that the daily, weekly, or monthly volatility of the market value of fixed-rate assets are incorporated into a measure of total portfolio risk analysis along with equity's market risk, and that of foreign-denominated assets. For balance sheet exposure to interest rate risk, commercial banking firms follow a different drummer. Given the generally accepted accounting procedures (GAAP) established for bank assets, as well as the close correspondence of asset and liability structures, commercial credit Unions tend not to use market value reports, guidelines or limits. Rather, their approach relies on cash flow and book values, at the expense of market values (Baldoni, 1998)

According to Iqbal and Mirakhor, 2007, every institution has an investment policy in place which defines the set of allowable assets and limits to the bank's participation in any one area, all institutions restrict the activity of the treasury to some extent by defining the set of activities it can employ to change the bank's interest rate position in both the cash and forward markets. Some are willing to accept derivative activity, but all restrict their positions in the swap caps and floors market to some degree to prevent unfortunate surprises. As reported losses by some institutions mount in this area, however, investment guidelines are becoming increasingly

circumspect concerning allowable investment and hedging alternatives. In this area there is considerable difference in current practice. This can be explained by the different franchises that coexist in the banking industry. Most banking institutions view activity in the foreign exchange market beyond their franchise, while others are active participants. The former will take virtually no principal risk, no forward open positions, and have no expectations of trading volume (Iqbal and Mirakhor, 2007).

2.5.2 Portfolio Asset Quality

A good credit culture has strong policies and credit standards, while new markets are selected to conform to the existing culture. The effectiveness of the credit risk management is verified by internal risk control and audit that monitor credit discipline, loan policies, approval policies, facility risk exposure (Bessis, 2003) and portfolio level. Portfolio asset quality is only guaranteed when the credit risk department has strong policies and risk systems. The optimal risk strategy is the one that is in line with the business strategy. It is not the one that minimizes losses, but the one that provides a good credit quality in line with the business objectives. risk. The credit culture is supported by the top management and by a strong credit risk management.

A sound credit risk management is built upon a good-quality portfolio of performing assets. The pricing of the loans has to reflect the risk. A good selection strategy aims to avoid high losses. Credit scoring is a credit risk management technique that analyzes the borrower's risk. In its early meaning, credit scores" were assigned to each customer to indicate its risk level. A good credit scoring model has to be highly discriminative: high scores reflect almost no risk and low scores correspond to very high risk, or the opposite, depending on the sign condition (Pykhtin, 2005).

The credit culture is similar to the value driven, with emphasis on strong credit quality, but for which deviation can be omitted during periods of low credit demand. Dermine, and Bissada, (2002), indicated that market share and volume growth are the highest priority, which is motivated by the ambition to become or to remain a large player on the market. Front office lenders are demanded to produce new loans and may experience difficulties with credit risk loan approvers, because of low credit quality and non-adequate pricing. Loan approvers see their influence limited because of the conflicting interests of value and asset quality. Success depends on the strength of the credit risk management to control the approval process and to keep sufficient asset quality in the growing portfolio (Gardner and Mills 1991).

2.6 Credit Risk Management Practices on Performance of Credit Unions

Commercial banking is a combination of related activities such as providing products and services to the customers, engaging in financial intermediation and management of risk. In recent years, risk management has received increasing focus as a central activity of commercial credit Unions. The justification for studying credit Unions' activities by focusing on risk management can be traced to Merton (1995) who argued that financial systems should be analyzed in terms of a "functional perspective" rather than an "institutional perspective" since over long periods of time functions have been much more stable than institutions. Research on financial services has followed this functional approach by relating credit Unions' activities to the functions performed by them. Merton (1989) suggested that, inter alia, the central function of a financial institution is its ability to distribute risk across different participants. According to Saunders and Cornett (2006), modern financial institutions are in the risk management business as they undertake the functions of beating and managing risks on behalf of their customers through the pooling of risks and the sale of their services as risk specialists.

Given the importance of risk management in a bank's functioning, the efficiency of a bank's risk management is expected to significantly influence its financial performance (Harker and Satvros, 1998). An extensive body of banking literature (Santomero and Babbel, 1997) argues that risk management matters for financial performance of banking firms. According to Pagano (2001), risk management is an important function of financial institutions in creating value for shareholders and customers. The corporate finance literature has linked the importance of risk management with the shareholder value maximization hypothesis. This suggests that a firm will engage in risk management policies if it enhances shareholder value (Ali and Luft, 2002). Thus, effective risk management either in non-banking firms or in banking entities is expected to enhance the value of the firm and shareholder wealth.

2.7 Empirical Review

Linbo Fan (2004) examined efficiency versus risk in large domestic USA credit Unions. He found that profit efficiency is sensitive to credit risk and insolvency risk but not to liquidity risk or to the mix of loan products. Ho Hahm (2004) conducted an empirical study on interest rate and exchange rate exposures of banking institutions in pre-crisis Korea. Results indicated that Korean commercial credit Unions and merchant banking corporations had been significantly exposed to both interest rate and exchange rate risks, and that the subsequent profitability of commercial credit Unions was significantly associated with the degree of pre-crisis exposure. The results also indicated that the Korean case highlights the importance of upgrading financial supervision and risk management practices as a precondition for successful financial liberalization.

Risk management dictates that as long as the demand for liquidity from depositors and borrowers is not too highly correlated, the intermediary should pool these two classes of customers together to conserve on its need to hold costly liquid assets the buffer against unexpected deposit withdrawals and loan take downs. Liquidity risk management is entering a new and much more demanding era. The Basel Committee on Banking Supervision and the International Institute of Finance has set high hurdles in terms of principles and recommendations. The UK Financial Services Authority (FSA), meanwhile, will soon be publishing its proposals for reinvigorating its liquidity risk regulations.

According to AMFIs (2011), K-Rep implemented a credit risk program that brought employees "Back to Basics," which reemphasized the fundamental principles of microfinance and its commitment to the micro entrepreneur. K-Rep lowered the maximum initial loan size from \$431 to \$238, reduced the rate of increase for subsequent loans, and shortened loan terms. In addition, K-Rep enhanced management's supervision of credit officers, and increased the amount and frequency of loan portfolio monitoring. These changes returned the focus to the original target population and discouraged the participation of higher income clients. By the end of 1998, K-Rep had delinquency under control and reduced its portfolio at risk ratio to 8.8 percent (Kim and Santomero, 1993). In this regard there is need to carry out the study to establish the relationship between credit risk management practices and the performance of the Deposit Taking Microfinance Institutions in Kenya. K-Rep implemented a credit risk program that brought employees "Back to Basics," which reemphasized the fundamental principles of microfinance and its commitment to the micro entrepreneur after experiencing poor performance in loans portfolio quality had diminished from 5.0% to 18.3% (AMFIs, 2011)

Funding growth through core deposits has become largely a thing of the past. The advent of nonbank competition and the rise of third-party funding mean that community credit Unions now operate in a dynamic funding market, which requires the use of more sophisticated liquidity risk management practices. Industry experts point to many different underlying causes for the demise of growth in deposits, such as the increased financial sophistication of the public, demographic shifts, the rise of nonbank competitors offering a whole wave of alternative investment products, new delivery systems such as the Internet, and competition from credit unions and insurance companies.

Niinimaki (2004) in his paper entitled "The effects of competition on credit Unions' risk taking" found that the magnitude of risk taking depends on the structure and side of the market in which competition takes place. He also concluded that if the bank is a monopoly or credit Unions are competing only in the loan market, deposit insurance has no effect on risk taking. Credit Unions in this situation tend to take risks, although extreme risk taking is avoided. In contrast, introducing deposit insurance increases risk taking if credit Unions are competing for deposits. In this case, deposit rates become excessively high, thereby forcing credit Unions to take extreme risks. Wetmore (2004) examined the relationship between liquidity risk and loans-to-core deposits ratio of large commercial bank holding companies. He concluded that the average loan-to-core deposit ratio had increased over the period studied, which reflects a change in the asset/liability management practices of credit Unions. He also concluded that there is a positive relationship occurring between market risk and the loans-to-core deposits ratio.

Gisemba (2010) carried out a study on impact of credit risk management practices on financial performance among the SACCOs. He sampled 41 SACCOs and concluded that SACCOs needs

management credit risk effective to prevent it from failing in its obligation and meeting its objective, minimize loan defaulters, cash loss and ensures the organization performs better increasing the return on assets and helps the organization in attaining maximum financial returns. The study further concludes that there was a positive relationship between credit risk management practices and the financial performance of SACCOs, depicting the relationship between credit risk management practices and financial performance in organizations. Therefore, it is necessary for SACCOs to have in place comprehensive risk management practices and reporting process to identify, measure, monitor, manage, report and control credit risks. Efficient credit risk management practices have been vital in allowing the phenomenal growth in credit unions. Effective management of credit risk is critical to enhance SACCOs' viability and sustained growth. Failure to control credit risk may lead to insolvency.

2.8 Conclusions

As Deposit Taking MFIs continue expand and diversify in serving more customers and attracting more mainstream investment capital and funds, they need to strengthen their internal capacity to identify and anticipate potential risks to avoid unexpected losses and surprises. Creating a credit risk management framework and culture within a Deposit Taking MFIs is the next step after mastering the fundamentals of individual risks, such as credit risks. Further, more clarity about the roles and responsibilities of managers and board members in credit risk management helps build stronger institutions

Previous studies on credit risk management have not focused on the effects on the credit risk management practices on financial performance of the credit unions. Ngare (2008) undertook a survey of credit risk management practices by commercial banks in Kenya while Muturi (2010)

carried out a survey of techniques or credit risk management in micro-finance institutions in Kenya. This study has critically analyzed credit risk management practices which could be used by conventional financial institutions and suggest ways in which Deposit Taking MFIs further adapt and innovate to create the optimal risk management culture within their own organizations.

The construction of portfolios that benefit from diversification across borrowers and that reduce the effects of any one loss experience is another. The implementation of incentive-compatible contracts with the institution's management to require that employees be held accountable is the third. In each case the goal is to rid the firm of risks that are not essential to the financial service provided, or to absorb only an optimal quantity of a particular kind of risk (Maina 2008).

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter describes the methods that were used in the collection of data pertinent in answering the research questions. It is divided into research design, study population, sample design, data collection and data analysis method.

3.2 Research Design

Research design refers to the way the study is designed, that is, the method used to carry out a research. It is important to highlight the two main methods when investigating and collecting data quantitative and qualitative. A quantitative approach is strongly linked to deductive testing of theories through hypotheses, while a qualitative approach to research generally is concerned with inductive testing (Saunders et al, 2003). The main focus of this study was quantitative. However some qualitative approaches were used in order to gain a better understanding and possibly enable a better and more insightful interpretation of the results from the quantitative study.

This research problem can best be studied through the use of a descriptive research design. Descriptive research is the investigation in which quantitative data is collected and analysed in order to describe the specific phenomenon in its current trends, current events and linkages between different factors at the current time. Descriptive research design was chosen because it

enabled the researcher to generalise the findings to a larger population. The descriptive research design approach have been credited due to the fact that it allows analysis the relations of variables under study using linear regression as long as the sampling units for the study are many.

3.3 Target Population

The population of this study comprised of all licensed Deposit taking microfinance institutions. Currently there are there are 6 licensed Deposit Taking Microfinance institutions (AMFIK)

3.4 Data Collection

The researcher used both primary and secondary data. Primary data was obtained through self-administered questionnaires with closed and open-ended questions. The questionnaires included structured and unstructured questions and was administered through drop and pick method to respondents who were Managing managers, credit managers, financial managers, auditor and accountants in the organization. The closed ended questions enabled the researcher to collect quantitative data while open-ended questions enabled the researcher to collect qualitative data. Secondary data was collected Deposit taking Microfinance books for the period of 5 years from year 2007 to 2011.

3.5 Data Analysis

Before processing the responses, the completed questionnaires were edited for completeness and consistency. The data was then coded to enable the responses to be grouped into various categories. A descriptive analysis was employed. Descriptive statistics such as means, standard deviation and frequency distribution were used to analyze the data. All quantitative data on credit

risk management was measured in real values by normalizing. Multiple regression was used to measure the quantitative data which was analyzed using the SPSS. Tables and other graphical presentations as appropriate were used to present the data collected for ease of understanding and analysis. The researcher used the data with an aim of presenting the research findings in respect to venture capital financing. Tables were used to summarize responses for further analysis and facilitate comparison. This generated quantitative reports through tabulations, percentages, and measure of central tendency. Cooper and Schindler (2003) notes that the use of percentages is important for two reasons; first they simplify data by reducing all the numbers to range between 0 and 100. Second, they translate the data into standard form with a base of 100 for relative comparisons.

Multiple regressions is a flexible method of data analysis that may be appropriate whenever quantitative variables (the dependent) is to be examined in relationship to any other factors (expressed as independent or predictor variable). Relationships may be non-linear, independent variables may be quantitative or qualitative and one can examine the effects of a single variable or multiple variables with or without the effects of other variables taken into account, (Coben, Cohen, West and Aiken, 2003).

For this study, the researcher was interested in measuring the credit risk management practices in the Deposit taking Microfinance in Kenya. The factors of are β (independent variables) and dependent variable is Y. Credit risk management practice was quantified from likert questions While financial performance of the Deposit Taking MFIs were measure by Return on Assets.

The regression equation is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \alpha$$

Where Y is the dependent variable (profitability),

β_0 is the regression coefficient,

$\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 are the slopes of the regression equation

The independent variables are; X_1 the loan portfolio,

X_2 the risk identification,

X_3 the risk analysis and assessment, X_4 risk monitoring and X_5 credit risk monitoring procedures while α is an error term normally distributed about a mean of 0 and for purpose of computation, the α is assumed to be 0. The equation was solved by the use of statistical model where SPSS was applied.

The Return on Assets was as an indicator of how profitable Deposit Taking MFIs was relative to its total assets. ROA gave an idea as to how efficient management is at using its assets to generate earnings. Return on asset was calculated by dividing Deposit Taking MFIs annual earnings by its total assets, to display as a percentage. Using ROA as a comparative measure is best to compare it against a company's previous ROA numbers or the ROA of similar financial institutions.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter presents the data analysis, interpretation and presentation there-to on the study to investigate the impact of credit risk management practices on financial performance of Deposit Taking MFIs in Kenya. The study had targeted 36 respondents out of which 34 respondents filled and returned their questionnaire constituting 94 % response rate. Data analysis was done through Statistical Package for Social Scientists (SPSS) version 17. Frequencies, percentages and mean were used to display the results which were presented in tables and graphs.

4.2 General Information

Position of the respondents

The respondents were requested to state their position in the organization. From the findings it was found out that some of the respondents were loan officers, marketing officers, customer care representative, finance managers, operations manager's administration managers, credit officer's accountants and assistant accountants.

Years served in the DTMFIs

The study requested the respondents to state the period that they have been working in the organization. From the findings it was found out that respondents had worked for 13years, 12 years, 11 years, 14 yeas and even 2, 3, 4, 5 years.

Number of employees

Table 4. 1: Number of employees in the DTMFIs

	Frequency	Percent
1-250 employees	20	58
251 -500 employees	10	29
501-750 employees	4	11
Total	34	100

Source: Author (2012)

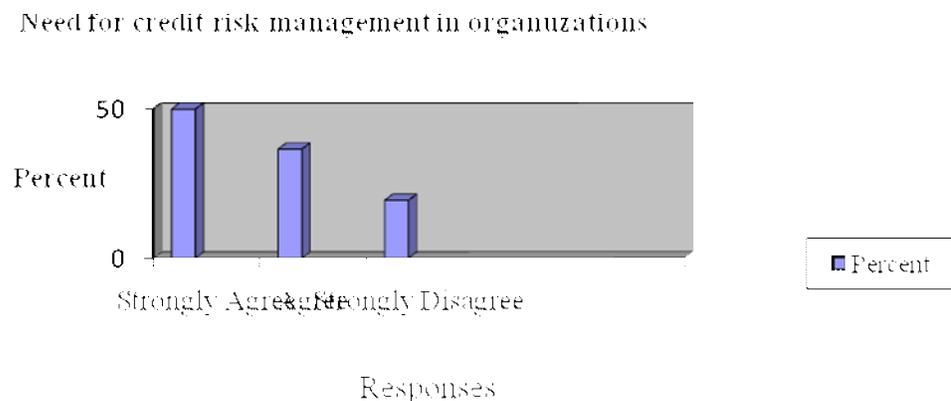
The study sought to find the number of the employees in the firm. From the findings majority 58% of the respondents indicated that the number of employees in the firm ranged between 1-250 employees, 29% of the employees indicated that the number of the employees ranged between 251-500 while 11% of the respondents indicated the number of the employees in the firm ranged between 501-750 employees.

DTMFIs been in existence

The researcher requested the respondents to state the period in time that the Deposit Taking MFIS had been in existence. From the findings most of the respondents indicated that the institutions had been in existence for 3, 5,7,1,9 and 10 years.

4.3 Credit Risk Management Practices

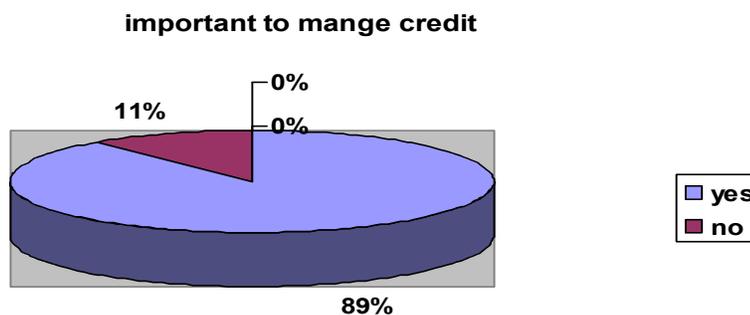
Figure 4. 1: Extent of agreeing that DTMFIs needs to ensure credit risk management is well done



Source: Author (2012)

The respondents were requested to indicate the extent to which they agreed with the statement that DTMFIs needs to ensure credit risk management is well done to prevent it from failing in its obligation and meeting its objective. From the findings, majority 50% of the respondents strongly agreed that DTMFIs need to ensure credit risk management is well done as indicated by of the respondents. 30.6% of the respondent agreed that DTMFIs needs to ensure credit risk management is well done while 19.4% of the respondents agreed the DTMFIs needs to ensure credit risk management is well done. This implies that DTMFIs required management it credit risks effectively to enhance it financial performance.

Figure 4. 2 : Whether is important to manage credit Risk management

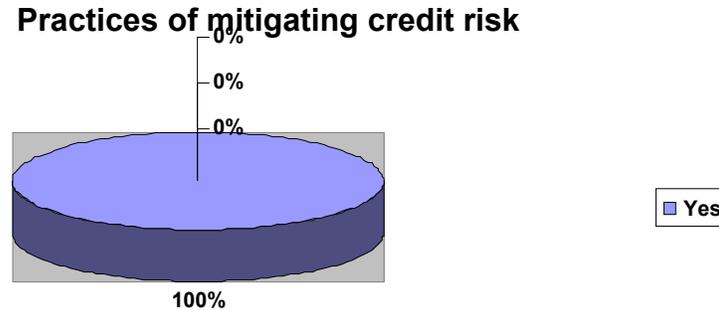


Source: Author (2012)

The study requested the respondents to give indicate whether it was important for DTMFIs to manage credit risk that it's exposed to. From the findings it was found out that majority of the respondents indicated that it was important for the to manage credit risk as indicated by 89% of the respondents while 11% of the respondent indicated that it was not important for the DTMFIs to manage credit risk.

4.3.1 Practices of mitigating credit risk

Figure 4. 3 Practices of mitigating credit risk



Source: Author (2012)

The study sought to find whether the DTMFIs had in place practices of mitigating credit risk. From the findings, all 100% of the respondents indicated that the DTMFIs has in place the practices of mitigating credit risk to maximize on performance.

The importance of adopting credit risk management practices

The study sought to investigate the importance's of credit risk management. From the findings, respondents indicated that the importance of credit risk managements were that it minimizes loan defaulters, cash loss and ensures the organization performs better increasing the return on assets. It was also found that it helps the organization in adopting the most efficient and effective method of concurring various credit risk in the organization.

Table 4. 2: Practices adopted by DTMFIs in credit risk management

	Frequency			% of yes
	Yes	No	Total	
Credit scoring mechanism	22	12	34	64
Risk identification	20	14	34	58
Risk analysis and assessment	24	10	34	70
Risk monitoring	18	16	34	52

DTMFIs loan policy procedure	29	5	34	85
Diversification across union members	15	19	34	44
Portfolio asset quality/portfolio management	18	16	34	52

Source: Author (2012)

The study sought to find the practices that were adopted by the DTMFIs in credit risk management. From the findings, majority 85%, 70%, 64%, 58% and 52% of the respondents indicated that DTMFIs adopted loan policy procedure, risk analysis and assessment, credit scoring mechanism, risk identification, and diversification across union members as practices used by the DTMFIs in credit risk managements.

4.3.2 Approaches used in screening and risk analysis before awarding credit to customer

Table 4. 3 : Approaches used in screening and risk analysis before awarding credit to customer

	Not at all	Least	Moderate	Most	N	Mean	Std dvt
Character of borrower	4	0	14	16	34	3.27	0.94
Capacity/competition	0	2	2	30	34	3.7	0.65
Conditions	1	4	3	26	34	3.52	0.90
Collateral/security	2	0	7	25	34	3.47	0.97

Source; Author (2012)

The study sought to find the approaches that are used by the DTMFIs in screening and risk analysis before awarding credit to clients. From the findings, most of the respondents agreed to a great extent that capacity/competition and conditions are the approaches mostly used as in screening and risk analysis before awarding credit to clients as indicated by a mean of 3.72 and 3.52 respectively. It was further found that most of the respondent agreed to a moderate extent that collateral/security and character of borrower were used in screening and risk analysis before awarding credit to clients as indicated by a mean of 3.47 and 3.28 respectively.

Table 4. 4: Extent to which issues of credit risk management are agreed upon

	Strongly	Agree	Neutral	Disagree	Strongly	N	Mean	Std dvt
For credit risk decision to be made standardization of process and documentation is required	20	10	0	0	4	34	4.72	0.25
Credits must be monitored and reviewed periodically for quality credit control	15	10	0	9	0	34	4.02	0.23
Portfolio managers should watch over loan portfolio's degree of concentration and exposure	12	8	5	5	4	34	4.56	0.41
Member lending facility is reported to the credit risk management committee	14	7	0	5	8	34	3.50	1.68
Risk management practices are monitored and set by the credit committee	10	11	4	4	5	34	4.41	1.42

Source : Author (2012)

The tables indicate the Responses of the respondents on the statement on issues about credit risk management in the DTMFIs. From the findings majority of the respondents strongly agreed that credit risk decision was made for standardization of process and documentation was required and that portfolio managers should watch over loan portfolio's degree of concentration and exposure were issues of credit risk management as indicated by a mean of 4.72 and 4.56 respectively. Most of the respondents agreed risk management practices are monitored and set by the credit committee, credits must be monitored and reviewed periodically for quality credit control and member lending facility is reported to the credit risk management committee as indicated by a mean of 4.41, 4.02 and 3.50 respectively. This clearly indicated that DTMFIs management emphasize on enhancing credit risks management to maximize on their financial performance.

Table 4. 5: Means of making awareness of credit risk

	Not at all	Least	Moderate	Most	N	Mean	Std dvt
Regular meetings	0	8	9	19	34	3.31	.82
Regular training	0	4	15	17	34	3.85	.68
Using supervision on one to one basis	5	0	16	15	34	3.13	.99

Source : Author (2012)

The study sought to investigate the mean by which the DTMFIs staffs are made aware of credit risks. From the findings majority of the respondents indicated that they undergoes regular trainings as the mostly used means make the staff aware of the credit risk as indicated by a mean of 3.85. It was further found that majority of the respondents indicated that regular meetings and supervision on one to one basis were moderately used mean in making staff aware of the credit risks as indicated by a mean of 3.31 and 3.13 respectively.

4.3.3 Extent to which DTMFI's consider risk identification process

Table 4. 6: Extent to which DTMFI's consider risk identification process in credit risk management

	Frequency	Percent
Very great extent	23	67
Great extent	9	26
Moderate extent	2	7
Total	34	100

Source: Author (2012)

The respondents were requested to indicate the extent to which DTMFIs consider risk

identification process in credit risk management. From the findings, majority of the respondents 67% indicated that DTMFIs consider risk identification process in credit risk management to a very great extent, 26% indicated that DTMFIs consider risk identification process in credit risk management to a great extent while 7% of the respondents indicated that DTMFIs consider risk identification process in credit risk management to a moderate extent. This clearly implied that risk identification was used as a credit risk management practices in DTMFIs to a greater extent.

4.3.4 Extent to which DTMFIs apply the following methods in loan recovery

Table 4. 7: Extent to which DTMFIs apply the following methods in loan recovery

	Not at all	Least extent	Moderate	Fair extent	Great extent	N	Mean	Std dvt
Use auctioneers to recover	4	7	16	0	9	34	3.08	0.29
The firm recover the defaulted loans from Guarantors	3	13	7	4	9	34	4.18	0.36
Write the debt off and account it as bad debts	0	3	23	5	5	34	3.33	0.82
Write off interest and allow them to pay the principle	0	9	13	5	9	34	3.38	0.12

Source: Author (2012)

The study sought to know the extent to which DTMFIs apply the given methods in loan recovery. From the findings, most of the respondents indicated that management of DTMFIs use the DTMFIs management recover the defaulted loans from Guarantors to recover the money as methods in loan recovery to a great extent as indicated by a mean of 4.18. other respondents indicated that writing the debt off and account it as bad debts and writing off interest and allowing client to pay the principle were use as a methods in loan recovery to a moderate extent

as indicated by a mean of 3.33 and 3.08 respectively. This clearly indicated that DTMFIs do adopt various methods of loan recovery to avoid loan loss which may limit the performance of the organizations.

Table 4. 8: Time of decision on whether the client has defaulted on loan payment

	Not at all	Least	Moderate	Most	N	Mean	Std dvt
One month late payment	4	15	4	11	34	2.72	0.08
Three months loan payment	1	6	17	10	34	3.11	0.78
More than twelve months late payments	0	3	11	22	34	3.52	0.65
Using supervision on one to one basis	9	0	14	11	34	3.13	0.29

Source : Author (2012)

The respondents were requested to indicate the time of decision on whether the client has defaulted on loan payment. From the findings, most of the respondent agreed to a greater extent that client is said to have defaulted the loan after more than twelve months' late payments as indicated by a mean of 3.52. The study also found that most of the respondents agreed that client default loan payment after using supervision on one to one basis and three months failure of loan repayment to a moderate extent as indicated by a mean of 3.13 and 3.11 respectively. The study further found that most respondents were indifferent on whether is the decision taken that the client had defaulted after one month late payment indicated by a mean 2.72 .This clearly indicates that the management of the Deposit Taking MFIS made decision regarding when the client had defaulted the credit facility for action to taken on how loans can be recovered.

Table 4. 9 Extent of agreeing with the statement on issues of credit risk management

	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	N	Mean	Std dev
Credit risk management is essential to optimizing the performance	22	10	0	0	2	34	4.72	0.25
Sound credit risk management practices are built on good quality portfolio management	3	25	0	4	2	34	4.67	0.15
Credit union adopted credit documentation as a ways of managing credit risk	11	9	5	4	5	34	4.63	0.51
The use of collateral	23	7	0	0	4	34	4.63	0.6
Better portfolio monitoring	4	26	0	4	0	34	4.11	0.74
Credit officers must posses adequate appraisal	14	12	8	0	0	34	3.77	0.79
Customers are offered good free consultant services	9	20	1	4	0	34	3.00	0.86

Source : Author (2012)

The study sought to find the extent to which the respondents agree with the issues concerning credit risk management in the Deposit Taking MFIS. From the findings majority of the respondents strongly agreed that credit risk management is essential to optimizing the performance and that sound credit risk management practices were built on good quality portfolio management, credit union adopted credit documentation as a ways of managing credit risk and the use of collateral enhances risk management in Deposit Taking MFIS as indicated by a mean of 4.72, 4.67, 4.64 and respectively 4.63. Most of the respondents agreed that better portfolio monitoring and adequate appraisal of the credit officers enhances credit risk management in Deposit Taking MFIS.

4.4 Regression Analysis

A multivariate regression model was applied to determine the relationship between credit risk management practices on financial performance of Deposit Taking MFIs in Kenya

The logistic regression used in this model was:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \alpha$$

Where Y= Return on Assets = Constant Term, β_1 = Beta coefficients X_1 = Loan portfolio, X_2 = Risk identification, X_3 = Risk analysis and assessment, X_4 = Risk monitoring, X_5 = Credit risk monitoring procedures, and α = Error Term

Table 4. 10 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.072(a)	.518	.516	0.24	1.841	6	.307	5.191	.001(a)

a Predictors: (Constant), loan portfolio, risk identification, risk analysis and assessment, risk monitoring and credit risk monitoring procedures

Dependent: Return on Assets

R is the square root of R-Squared and is the correlation between the observed and predicted values of dependent variable implying that the association of 0.072 between Return on Assets and Credit risk management practice which include loan portfolio, risk identification, risk analysis and assessment, risk monitoring and credit risk monitoring procedures was strong.

Adjusted R^2 is called the coefficient of determination and tells us how the financial performance of the Deposit Taking MFIs will varies with variation in credit risk management practices which include loan portfolio, risk identification, risk analysis and assessment, risk monitoring and

credit risk monitoring procedures. From table above, the value of adjusted R^2 is 0.518. This implies that, there was a variation of 51.8% of financial performance varied with variation in credit risk management practices loan portfolio, risk identification, risk analysis and assessment, risk monitoring and credit risk monitoring procedures at a confidence level of 95%.

ANOVA (b)

Table 4. 11 ANOVA (b)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.741	6	.307	5.191	.001(a)
	Residual	1.814	28	.059		
	Total	3.556	34			

a Predictors: (Constant), loan portfolio, risk identification, risk analysis and assessment, risk monitoring and credit risk monitoring procedures

Dependent: Return on Assets

Regression, Residual, and Total. The Total variance was the difference into the variance which can be explained by the independent variables (Model) and the variance which was not explained by the independent variables (Error). The strength of variation of the predictor values influence the Return on Assets dependence variable at 0.01 significant levels.

Coefficients (a)

Table 4. 12 Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.000	.275		3.640	.001
	Loan portfolio	0.571	.495	.857	2.931	0.03
	Risk identification	0.817	.446	.000	.000	0.01
	Risk analysis and assessment	0.712	.628	.000	.000	0.02

	Risk monitoring	0.545	.490	-.629	1.972	0.04
	Credit risk monitoring procedures	0.641	.429	.000	.000	0.03

a Predictors: (Constant), loan portfolio, risk identification, risk analysis and assessment, risk monitoring and credit risk monitoring procedures

Dependent: Return on Assets

The established regression model was;

$$Y = 1.000 + 0.571X_1 + 0.817X_2 + 0.712X_3 + 0.545X_4 + 0.641X_5$$

From the above regression model, it was found that financial performance of the Deposit Taking MFIs would be at 1.000 when the organization do not apply or holding credit risk management practices constant. A unit increase in effective loan portfolio would lead to increase in return on asset of the Deposit Taking MFIs by factor of 571 with a p value of 0.03; a unit increase in risk identification in Deposit Taking MFIs would lead to an increase in return on assets by a factor of 0.817 with a P value of 0.01. The study also found that a unit increase in risk analysis and assessment would result to an increase in return on asset of the Deposit Taking MFIs by a factor of 0.712 with a P value of 0.02; proper risk monitoring would result to an increase in return on asset of the Deposit Taking MFIs by a factor of 0.545 with a P value of 0.04 while effectiveness in credit risk monitoring procedures would result to an increase in return on asset by factor of 0.641 with a P value of 0.03.

This clearly indicates that that there existed a negative relationship between credit risk management practices and return on asset in Deposit Taking MFIs.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The study established that Deposit Taking MFIs needs to ensure credit risk management is effective to prevent it from failing in its obligation and meeting its objective. From the findings it the study indicated that it's important for Deposit Taking MFIs to manage credit risk so as to maximize on its return on assets. The study discovered that Deposit Taking MFIs needs effective credit risk managements to minimize loan defaulters, cash loss and ensures the organization performs better increasing the return on assets. It was also found that credit risk management helps the organization attains maximum financial returns.

The study established that there approaches that are used by the Deposit Taking MFIs in screening and risk analysis before awarding credit to clients to minimize on loan loss. From the findings, the capacity/competition and conditions are the approaches mostly used as in screening and risk analysis before awarding credit to clients.

It was further found that most of the respondent agreed to a moderate extent that collateral/security and character of borrower were used in screening and risk analysis. Credit risk management is essential to optimizing the performance and that sound credit risk management practices were built on good quality portfolio management, credit union adopted credit documentation as a ways of managing credit risk and the use of collateral enhances risk management in Deposit Taking MFIs

The study also conclude that Deposit Taking MFIs adopt various approaches in screening and analyzing risk before awarding credit to clients to minimize on loan loss. This included

establishing capacity/competition and conditions and use of collateral/security and character of borrower were used in screening and risk analysis in attempt to reduce manages credit risks

5.2 Conclusion

From the findings, the study concludes that Deposit Taking MFIs needs management credit risk effective to prevent it from failing in its obligation and meeting its objective, minimize loan defaulters, cash loss and ensures the organization performs better increasing the return on assets and helps the organization in attaining maximum financial returns.

From the findings the study concludes that Deposit Taking MFIs adopted loan portfolio, risk identification, risk analysis and assessment, risk monitoring and credit risk monitoring procedures practices in credit risk managements. The study also conclude that the management of the Deposit Taking MFIs were involved in the management of the credit risk through making credit risk decision through standardization of process and documentation watch over loan portfolio's degree of concentration and exposure for credit risk management.

The study also establishes way through which the firm staffs were made aware of credit risks. It was established that regular meetings and supervision on one to one basis for staff enable the staff be wary risks facing the organization and what action to take to mitigate it. The study further concludes that Deposit Taking MFIs consider risk identification process in credit risk management Deposit Taking MFIs as important in credit risk management as essential in optimizing the performance and that sound credit risk management practices were built on good quality portfolio management, credit union adopted credit documentation as a ways of managing credit risk and the use of collateral enhances risk management in Deposit Taking MFIs

The study further concludes that there was a positive relationship between credit risk management practices and the financial performance of Deposit Taking MFIs, depicting the relationship between credit risk management practices and financial performance in organizations.

5.3 Policy Recommendation

Given the findings from this study, there are a number of policy recommendations that can be adopted by the Deposit Taking MFIs Management in militating against credit risks facing to enhance their financial performance .A policy recommendation is simply written policy advice prepared for some group that has the authority to make decisions. The Deposit Taking MFIs policy recommendations are the key indicators through which Deposit Taking MFIs policy decisions will be made in most levels of Deposit Taking MFIs

Deposit Taking MFIs management should also enhance construction of employee teams through providing training to improve the business knowledge by employees, train and attract persons with compound abilities to enhance the capability to prevent and mitigate the credit risk, strengthen the admittance and exit management of qualification of credit members, and establish capable and self-disciplined teams based on the combination of employee team building and construction of credit culture and motivation mechanism. This will ensure effective risk identification and assessment is carried out before disbursement of credit to creditors mitigates the occurrence of the credit risk and improves financial performance.

Deposit Taking MFIs have suffered credit losses through relaxed lending standards, unguaranteed credits, and the borrowers' perceptions. .The study recommends that Deposit Taking MFIs should make a fairly accurate personality-morale profile assessment of prospective

and current borrowers and guarantors this will minimize credit risks by securing the borrower's guarantee.

The complicated, specialized management is the basis of high level centralized management in Deposit Taking MFIs which will promote integration and unifying the credit union operations, bring forward capital constrained risk asset management, improve limited management on industrial and regional risk, enhance quantitative management skills, based on deep data mining and analysis as well as advanced risk management instruments minimizing occurrence of credit risks facing the Credit unions and eventually enabling the Deposit Taking MFIs to gain higher financial performance .

From the finding and conclusions the study recommends that organizations should enhance credit risk management practices which includes portfolio asset quality/portfolio management, Deposit Taking MFIs loan policy procedure, risk monitoring, risk analysis and assessment, credit scoring mechanism, Diversification of Assets to earns high financial performance as the study established that there exist a positive relationship between credit risk management practices and financial performance of financial institutions.

5.4 Recommendations for further study

The study investigated the impact of credit risk management practices on financial performance in Deposit Taking MFIs. A further research should be carried to determine the effects of credit risk management practices on financial performance of the Microfinance institution in Kenya. The study also recommends that a further study should be carried out to determine the effects portfolio quality management financial institutions in Kenya to determine it impact on financial performance.

5.4 Limitations of the study

The main limitation of study was inability to include more organizations. This study only sampled DTMFIS. The study would have covered more institutions across financial sectors so as to provide a more broad based analysis. However, resource constraints placed this limitation.

The study also faces challenges of time resources limiting the study from collecting information for the study particularly where the respondent delay in filling the questionnaire and travelling for collection the filled questionnaire.

The respondents were found to be uncooperative from the respondents because of the sensitivity of the information required for the study. The researchers explained to the respondents that the information they provided was to be held confidential and was only for academic purpose only.

5.5 Recommendations for further study

The study investigated the impact of credit risk management practices on financial performance in Deposit Taking MFIs.

The study also recommends that a further study should be carried out to determine the effects portfolio quality management financial institutions in Kenya to determine it impact on financial performance.

REFERENCES

- Akkizidis, I. and Khandelwal, S. K. (2008), Financial Risk Management for Madison, WI, World council of Credit Unions Toolkit Series No. 4,
- Ali, F&Luft, C. (2002). Corporate risk management: costs and benefits. *Global Finance Journal*, Vol. 13 No.1, pp.29-38.
- Allen, F. and Santomero,(1997) .A The Theory of Financial Intermediation, Journal of Banking and Finance , 1997,
- Al-Tamimi, H. and Al-Mazrooei M., (2007), Banks' Risk Management: A Comparison Study of UAE National and Foreign Banks, The Journal of Risk Finance, Vol. 8 No.4, pp. 394-409.
- Archer, S. and Karim, R. A. A. (2007), Finance: The Regulatory Challenge, John Wiley and Son (Asia) Pte Ltd.
- Athanasoglou P.P., Brissimis S.N. and Delis M, (2005), Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Profitability, Bank of Greece Working Paper, No. 25
- Barth, J.R., Caprio, G. Jr, Levine, R. (2004) "Bank Regulation and Supervision: what works best?" *Journal of Financial Intermediation*, Vol. 13 pp.205-48.
- Barton, T. L., Shenkir, W.G. and Walker, P. L. (2002), Making Enterprise Risk
- Basel (1999), Principles for the management of credit risk", Consultative paper issued by the Basel Committee on Banking Supervision, *Basel*,(April 2010).
- Basel (2006), Principles for the management of credit risk", Consultative paper issued by the Basel Committee on Banking Supervision, *Basel*, (April 2010).
- BCBS (2001), Consultative Document: Principles for the Management and Supervision of Interest Rate Risk, Bank for International Settlements.
- BCBS (2006), Core Principles Methodology, Basel Committee on Banking Supervision, Bank for International Settlements.
- Berger, A. and Udell, G. (1993) Securitization, Risk, and the Liquidity Problem in Banking, Structural Change in Banking, M. Klausner and L. White, editors, Irwin Publishers, Illinois, 1993.
- Bessis, J. (2003) *Risk Management in Banking* (2nd edition), John Wiley & Sons, Chichester, New York.
- Bobáková, I.V. (2003) Raising the Profitability of Commercial Credit Unions, BIATEC, Volume XI,

- Boston Consulting Group (2001), *From Risk Taker to Risk Manager: Ten Principles for Establishing a Comprehensive Risk Management System for Banks*.
- Caoutte, J. B., E. I. Altman and P. Narayanan (1998), *Managing Credit Risk: The Next Great Financial Challenge*. John Wiley and Sons, New York.
- Christen, R.P. and Douglas, P., (2005), “*Managing Risks and Designing Products for Agricultural Microfinance*”, Rome: International Fund for Agricultural Development.
- Derban, W.K., Binner, J.M. and Mullineux, A. (2005) .Loan repayment performance in community development finance institutions in the UK. *Small Business Economics*, Vol. 25 pp.319- 32.
- Financial Sector Deepening, (2005), *Saving Credit Cooperative Societies Large SACCO Restructuring Facility outline*, Retrieved 18 February 2010, from, www.fsdkenya.org.
- Fuser, K., Gleiner, W. and Meier, G. (1999), *Risikomanagement (KonTraG) – Erfahrungen aus der Praxis, Der Betrieb*, Vol. 52, No. 15, pp. 753-758.
- Grais, W. And Kulathunga, A. (2007), *Capita; Structure and Risk in Financial Services in Archer, S. and Karim, R. A. A. 2007, Finance: The Regulatory Challenge*, John Wiley and Son (Asia) Pte Ltd.
- Greuning, H. and Bratanovic, S.B. (2003), *Analyzing and Managing Banking Risk, A Framework for Assessing Corporate Governance and Financial Risk*. 2nd edition, The World Bank, Washington, DC
- Greuning, H. and Iqbal, Z. (2007), *Banking and Risk Environment in Archer, S. and Karim, R. A. A. 2007, Finance: The Regulatory Challenge*, John Wiley and Son (Asia) Pte Ltd.
- Harker, P.T & Satvros, A.Z. (1998). *What drives the performance of financial institutions?.* The WhartonSchool, *University of Pennsylvania, Philadelphia, PA*, working paper.
- Haron, A. and Hin Hock, J.L. (2007). *Inherent Risk: Credit and Market Risks in Archer, S. and Karim, R. A. A. 2007, Finance: The Regulatory Challenge*, John Wiley and Son (Asia) Pte Ltd.
- Harrington, S.E. and Niehaus, G. R. (1999), *Risk Management*, Irwin/McGraw-Hill, New York.
- Iqbal, Z. and Mirakhor, A. (2007), *An Introduction to Finance: Theory and Practice* John Wiley and Son (Asia) Pte Ltd.
- Jackson-Moore, E. (2007), *Measuring Operational Risk in Archer, Simon and Karim, R.*
- Jansson, T. (2002), *Performance Indicators for Microfinance Institutions: Technical Guide*, MicroRate and Inter-American Development Bank, Washington, DC, available at: www.microrate.com (accessed February 2003), .

- Khan, T., and Ahmed, H. (2001), Risk Management: An Analysis of Issues in Financial Industry IRTI/IDB Occasional Paper, No. 5.
- Kim, D. and A.Santomero, (1993) Forecasting Required Loan Loss Reserves, Journal of Economics and Business, August, 1993.
- Kimeu Titus Kioko (2008) .A Survey of Credit Risk Management Techniques of Unsecured Bank Loans of Commercial Banks in Kenya.
- Kipchirchir David Tanui (2008). Foreign Exchange Risk Management Practices: A Survey of Motor Vehicle Industry in Kenya
- Kothari,C.R.(2004).Researchmethodology:Methods&techniques.NewDehi:NewAge International(P) Limited Publishers.
- KPMG (2003),Basel II – A Closer Look: Managing Economic Capital.
- Kwan S. and Eisenbeis, R.A. (2005), Bank Risk, Capitalization and Inefficiency, Paper retrieved on September 8, 2005 from <http://fic.wharton.upenn.edu/fic/papers/96/9635.pdf>
- Linbo, F., (2004), “*Efficiency versus Risk in Large Domestic US Banks*”, Lawrence St.Denver.
- Morris, S., (2001). *Coordination Risk and the Price of Debt*”, FMG Discussion Papers dp373, Financial Markets Group.
- Mutie, Christopher M.,”The relationship between credit scoring practices in Kenyan commercial banks and Nonperforming Loans.” MBA, University of Nairobi 2006(unpublished).
- Mwirigi P. Kwagara (2006), An Assessment of Credit Risk Management techniques adopted by micro finance institutions in Kenya. *Unpublished MBA research project UoN.*
- Naceur S.B. and Goaid M., (2003), The Determinants of the Tunisian Deposit Banks’ Performance, Applied Financial Economics, 11
- Ngare Evans Magara (2008) A Survey of Credit Risk Management Practices by Commercial Banks in Kenya.
- Oda M., Muranga J. (1997), “ANew Framework for Measuring the Credit Risk of a Portfolio”, *Institute for Monetary and Economic Studies (IMES)*, page. 1-45.
- Parrenas, J. C. (2005), and The Regulatory and Business Environment for Risk Management Practices in the Banking Sectors of APEC Economies: *Report of a Collaborative Survey Undertaken by the Pacific Economic Cooperation Council Finance Forum and the Asian Bankers' Association.* PP. 1-14.
- Pausenberger and Nassauer, (2000), Governing the Corporate Risk Management Function, in Frenkel, M. Hommel, U. and Rudolf, M. 2005, Risk Management: Challenge and Opportunity, Springer.

- Peters, J.M., Lewis, B.L., Dhar, V., (1989), “*Assessing inherent risk during audit planning: the development of a knowledge based model*”, *Accounting, Organizations and Society*, Vol. 14 No.4, pp.359-78.
- Pykhtin, M. (2005), *Counterparty Credit Risk Modelling: Risk Books*, Incisive Media, London.
- Richard, D.C. (2006), PEARLS monitoring system, World Council Information Center, Royal Society (1992), *Risk: Analysis, Perception and Management*, Report of a Royal Society Study Group, The Royal Society, London
- Saltzman, S., Salinger, D. (1998), *The Accion Camel technical note*, Accion International, Somerville, MA, available at: www.accion.org/pubs/main (accessed February 2003)
- Sundarajan, V. (2007), *Risk Characteristics of Products: Implications for Risk Measurement and Supervision in Archer, S. and Karim, R. A. A. 2007, Finance: The Regulatory Challenge*, John Wiley and Son (Asia) Pte Ltd
- Tchankova, L. (2002), *Risk Identification – basic stage in risk management*, *Environmental Management and Health*, Vol 13, No. 3, pp 290-297.
- Wambugu Stephen Maina (2008) *A Survey of Credit Risk Management Practices by Micro-Finance Institutions in Kenya*.

APPENDICES

Appendix1 : Questionnaire

Part A: General information

1. Name of the Deposit Taking MFIS (optional).....
2. Position of respondent.....
3. Years served in the Deposit Taking MFIS.....
4. Number of employees in the Deposit Taking MFIS
1-250 []
251-500 []
501- 750 []
751-1000 []
Over 1000 []
5. How long has the Deposit Taking MFIS been in existence?

Part B: Credit Risk Management Practices

1.To what extent do you agree with the statement, Deposit Taking MFIs need to ensure that credit risk management is well done to prevent it from failing in its obligations and meeting its objective.

- Strong Disagree []
Disagree []
Neutral []
Agree []
Strongly Agree []

2. Is it important for Deposit Taking MFIs to manage credit risk that it's exposed to?

- Yes []
No []

If yes, explain your Answer

.....
.....

3. Does your Deposit Taking MFIS have in place practices of mitigating credit risk?

Yes []

No []

4. What is the importance of adopting credit risk management practices?

.....
.....
.....

5. The following are practices used in credit risk management, please indicate the ones your Deposit Taking MFIS has adopted. (Tick where applicable)

Credit Scoring Mechanism..... []

Risk identification..... []

Risk analysis and assessment..... []

Risk monitoring..... []

Deposit Taking MFIs loan policy procedure..... []

Diversification across DTMFI members []

Portfolio asset quality/Portfolio management..... []

.Any other, please specify

.....
.....
.....

6. Which approach(s) among the following does your Deposit Taking MFIS use in screening and risk analysis before awarding credit to a customer? Tick appropriately? Where 1 represents least considered and 5 represents most considered

Approach	Not at All	Least	Moderate	Most
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Character of borrower				
Capacity /completion:				
Conditions				
Collateral /security				

Any other, Specify

.....

7.To what extent do you agree with each of the following statement about credit risk management procedures in your Deposit Taking MFIs?

Procedure	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
In order for credit decision to be made, standardization of process and documentation is required.					
Credits must be monitored and reviewed periodically for quality credit control.					
Portfolio managers should watch over the loan portfolio's degree of concentration and exposure.					
Member lending facility is reported to the credit risk management committee.					

Risk management practices are monitored and set by the credit committee					
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8. Through what means are your Deposit Taking MFIS staff made aware of credit risk?

Where 1 represents means not used at all and 4 most used means.

Means	Not At All	least	Moderate	Most used
Regular meetings				
Regular training				
Using supervision on one to one basis				

9. To what extent does your Deposit Taking MFIS consider risk identification process in credit risk management?

- To a very great extent []
- To a great extent []
- To a moderate extent []
- To a little extent []
- Not at all []

10. To what extent does your Deposit Taking MFIS apply the following methods in loan recovery when it is difficulty for the client to repay the loan on time? Where 1 indicates least used and 4 highly used.

Method	Not at all	Least extent	Moderate	Fair extent	Great extent
Use auctioneers to recover					
Sale of the property to recover the money					
Write the debt off and account it as bad debts					
Write off interest and allow them to pay the principle					

Any other, specify, Please specify,

.....

11. When does your organization decide that a client has defaulted on loan repayment?

Period	Not at all	least	Moderate	Most used
One month late payment				
Three months late payments				
More the twelve months late payments				
Using supervision on one to one basis				

12. To what extent do you agree with each of the following statement about credit risk management in your Deposit Taking MFIs?

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Credit risk management is essential to optimizing the performance of the Deposit Taking MFIS					
Sound credit risk management practices are built on good-quality portfolio management					
Credit unions have adopted credit documentation as a ways of managing credit risk.					
The use of collateral particularly fixed assets to recover defaulted loans is successful to some extent in recovering defaulted loan.					
Better portfolio monitoring and delinquency tracking through the use of appropriate reporting tools help in delinquency management.					
Credit officer's must posses adequate appraisal and monitoring skills, experience and good knowledge of credit risk management practices.					
Customers are offered good free consultant service.					

Appendixii: Deposit Taking Microfinance Institutions in Kenya

Faulu Kenya DTM Limited

Kenya Women Finance Trust DTM Limited

Remu DTM Limited

SMEP Deposit Taking Microfinance Limited

UWEZO Deposit Taking Microfinance Limited

Rafiki Deposit Taking Microfinance