

AN ANALYSIS OF CREDIT RISK ASSESSMENT THROUGH CREDIT SCORING
MODELS AMONG COMMERCIAL BANKS IN KENYA

KIOKO PETER MWANZIA

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DECLARATION

I declare that this project report is my original work and has not been presented in any other university for examination.

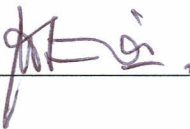
Signed 

Date 03-03-2011

KIOKO P.M

D53/13183/05

This is to certify that this project report has been submitted with my approval as the university supervisor.

Signed 

Date 09.03.2011

MR.NGABA.D

This is to certify that this project report has been submitted with my approval as chairman of the department.

Signed 

Date 06/03/11

CHAIRMAN, DEPARTMENT OF ACCOUNTING AND FINANCE



DEDICATION

To my dear parents, brothers and sisters.

Thank you for all your financial and moral support over the years.

This is what has made this study possible.

ACKNOWLEDGEMENTS

Much appreciation goes to all those who offered me moral and practical support in the production of this work.

I am grateful to my supervisor Mr. Ngaba. D for the guidance and advice he gave me right from proposal writing up to this point.

To my parents, brothers and sisters for their encouragement, understanding and support.

To my uncle Mr. David Nguli under whose support i was able to start the masters programme.

Much to God for His abundant blessings and unending mercies.

ABSTRACT

Risk management is a cornerstone of prudent banking practice. All banks in the present day volatile environment are facing a large number of risks such as credit risk, liquidity risk, foreign exchange risk, market risk, interest rate risk among others. These risks may threaten a bank's survival and success. From literature reviewed, effective credit risk management is lacking in most of the banking institutions. Credit risk assessment has been identified as one of the key skills required for successful banking operation. From literature reviewed, banks have been urged to engage in effective credit risk management techniques able to determine risk of default in their loan advances. One of these ways is through the use of credit scoring models in credit risk assessment.

The study sought to analyze credit risk assessment through credit scoring models within commercial banks in Kenya. It further sought to identify if there is any relationship between NPLs and credit scoring practices. Credit policy is also vital for effective risk management and was therefore analyzed. The study will be of great help to commercial banks, the public and academicians by providing further insights on credit scoring and credit risk assessment in banks. The study is a census therefore the population of the study consisted of all commercial banks operating within Nairobi. Data was collected using questionnaires which were administered to Personal banking officers of the various commercial banks through the headquarter offices. Descriptive data analysis techniques have been used in form of percentages and tables to show the various findings. Correlation analysis is used to determine the relationship between NPLs and credit scoring. These methods were chosen because the data collected is in frequencies as the variables are measured in categorical scale.

The study established that, 60.6% of the banks surveyed use credit scoring models during credit risk assessment of the various loan applicants while 39.4% do not use any credit scoring models on credit risk assessment. The study established that other methods used to assess credit risk are credit committee and analysis of financial statements like balance sheet and the profit and loss accounts in case of business loans. For personal loans, field observations on personal property and employment details are sometimes used. On the types of credit scoring models used, the study established that, risk adjusted return on capital model was the one mostly

used by banks at 60.6%. The study also established that, some banks use internally developed models for credit risk assessment. However, were not willing to disclose details about the models as part of their business strategies.

The study established that, there is a significant relationship between asset quality and use of credit scoring models. The correlation is at - 0.773, implying a strong negative relationship between use of credit scoring models and size of asset quality ratio. Further analysis, on the same variables indicated that, banks which have low asset quality ratio indicate low levels of NPLs.

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LIST OF ABBREVIATIONS

CBK - Central bank of Kenya

NPLs -Non performing loans

NBFIs- Non banking finance institutions

M.I.S - Management information system

CAMPARI - Character, Ability, Margin, Purpose, Amount, Repayment and Insurance

LIST OF FIGURES

Figure 1 - Model building process

Figure 2 - When banks started using credit scoring models

Figure 3 - Levels of NPLs

Figure 4 - Reasons attributed to levels of NPLs

Figure 5 - Rating in terms of credit risk assessment

DEFINATION OF TERMS

Risk is a concept that denotes a potential negative impact to some characteristic of value that may arise from a future event, or we can say that "Risks are events or conditions that may occur, and whose occurrence, if it does take place, has a harmful or negative effect". Exposure to the consequences of uncertainty constitutes a risk. In everyday usage, risk is often used synonymously with the probability of a known loss.

Risk management is a structured approach to managing uncertainty related to a threat, through a sequence of human activities including: risk assessment, strategies development to manage it, and mitigation of risk using managerial resources.

Credit risk is the risk of loss due to a debtor's non-payment of a loan or other line of credit (either the principal or interest (coupon) or both).

Credit risk management is the process of assessing risk in an investment. When the risk has been assessed, investment decisions can be made and the risk versus return balance considered from a better position.

Default occurs when a debtor has not met its legal obligations according to the debt contract, e.g. it has not made a scheduled payment, or has violated a loan covenant (condition) of the debt contract. Default may occur if the debtor is either unwilling or unable to pay their debt.

Non performing loans – refers to instances when loan borrowers default in schedule repayments due to unexpected misfortunes.

Credit scoring model – a model is a simplified description of a system or process. Credit scoring is a mathematical or statistical process of converting data about a prospective applicant into data which can be used to make a loan granting decision.

Policy- refers to broad bank statement which outlines how the bank intends to handle its various matters. Credit policy refers to the specific statements, guidelines and pronouncements and related issues associated with matters of bank credit process (credit policy).

Effectiveness (of risk management) - the contribution of risk management to the level of credit risk.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Commercial banks have faced difficulties over the years for many reasons, the major cause of serious banking problems continues to be directly related to lax credit standards for borrowers, poor portfolio risk management or lack of attention to changes in the economic circumstances and competitive climate (CBK, Annual Supervision Report, 2000). According to Peter (2002), awarding credit is a journey, the success of which depends on the methodology applied to evaluate and award the credit. This journey starts from the application for credit and ends at the time the loan from the credit process is finally fully paid. The credit management process has got its smooth and rough stages and therefore needs to be effectively controlled for it to be successful.

During the 1980's and 1990,s when the financial and banking crises became worldwide, new risk management banking techniques emerged. To be able to manage the different types of risks, one has to define them before one can manage them. The risks that are most applicable to banks are: credit risk, interest rate risk, liquidity risk, market risk, foreign exchange risk and solvency risk ((Bessis, 1998).

The Kenyan banking industry is diverse in terms of institutions, size and structure. Commercial banks in Kenya dominate this industry owing to their large size and being the most diversified of the financial intermediaries. This is on the basis of assets held and liabilities issued.

According to CBK Monthly Economic Review (January 2008), financial institutions in Kenya increased from 45 in December 2006 to 46 in December 2007 following commencement of banking business by Gulf African Bank limited, in November 2007. Operating Forex bureaus remained at 96 over the same period.

Credit risk is the oldest form of risk in the financial markets. If credit can be defined as “nothing but the expectation of a sum of money within some limited time”, then credit risk is the chance that this expectation will not be met (Sinkey, 1992). All banks have a need to spread overall lending risk as widely as possible to reduce exposure to any one trade or industry and therefore reduce the overall exposure risk and profitability.

They reduce portfolio risk by making advances to a wide variety of industries, spreading the risk among a broad client base. Being very aware of the risk of over concentration in any one sector, banks usually operate within industry threshold, limiting credit exposure to achieve the best mix of individual and portfolio safety (Mutwiri, 2006).

Risk management and assessment are the key skills of any successful banking operation. The risk management usually falls into a centralized or decentralized system. Such systems allow banks to evaluate and track risks on an industry, individual or portfolio basis (CBK, Risk Management survey, 2004).

Measurement of credit risk can be considered from the perspective of probability theory. The process of measuring loss potentials and their impact on banks and financial institutions leads to credit control and this involves a serious risk analysis, assessment and evaluation of the prospective customers before granting them credit (Mudegu, 2003).

A way of improving the credit risk management and credit analysis decision making involves the borrower being granted credit facilities on the basis of credit worthiness. Credit scoring models are some of the techniques used to determine the credit worthiness of borrowers. Credit scoring is a mathematical or statistical process of converting data about a prospective applicant or customer behavior into data which can be used to make a decision (Bill, 1998). Using historical data and statistical techniques, credit scoring tries to isolate the effects of various applicant characteristics on delinquencies and defaults (Mester, 1997). The method produces a “score” that the bank can use to rank its loan applicant or borrowers in terms of risk.

1.2 STATEMENT OF THE PROBLEM

Non-performing loans continue to be a problem with all commercial banks in Kenya (CBK, Monthly Economic review, January, 2009). Obiero (2004) found out that, out of the 39 banks which failed during the period of 1984 and 2004, 37.8 % collapsed mainly due to poor quality lending. According to CBK (2005) Banking Supervision Report, each bank should develop an effective and sound credit risk management to be able to contain credit risk where a comprehensive assessment of the risk profile of the customer must be undertaken during the loan process. According to the bank, the effectiveness of credit risk measurement process is

dependent on the quality of management information systems and the underlying assumptions supporting the models.

One of the ways that banks can use to achieve effective credit risk assessment is through credit scoring where each borrower is marked on a range of indicators thought to have some bearing on default risk (Gwilym, 2003). In developed world, the use of credit scoring by banks has been widely documented.

This study sought to analyze credit risk assessment through credit scoring models among commercial banks in Kenya. Further, it sought to assess the relationship between NPLs and credit scoring practices.

1.3 RESEARCH OBJECTIVES

1.3.1 GENERAL OBJECTIVE

This study aimed at examining the degree to which credit scoring practices are used within commercial banks in Kenya for credit risk assessment for loan applicants.

1.3.2 SPECIFIC OBJECTIVES

The specific objectives of the study were to:

- i) identify the credit scoring methods used by commercial banks in Kenya for credit risk assessment.
- ii) determine the relationship between NPLs and credit scoring practices.

1.4 RESEARCH QUESTIONS

The study used the following research questions:

- i) Which credit scoring methods do commercial banks within Kenya use in credit risk assessment?
- ii) What is the relationship between NPLs and credit scoring practices within Kenyan commercial banks?

1.5 SIGNIFICANCE OF THE STUDY

The findings of this study will be of great benefit to:

- a) Commercial banks and other institutions offering credit services by providing data on the extent of use of credit scoring among the different commercial banks in Kenya.

- b) Academicians: Not many studies have been undertaken on credit scoring in Kenya. The study will thus provide the necessary background for further studies to academicians
 - c) Public by providing more insights on the area of credit scoring during credit assessment.
- For example on how to improve ones score incase of personal loans.

1.6 SCOPE OF THE STUDY

The study sought to examine credit scoring practices within commercial banks. However only those commercial banks with branches within Nairobi town were examined for the analysis.

CHAPTER TWO

LITERATURE REVIEW

2.1 OVERVIEW OF KENYAN BANKING SYSTEM

Commercial banking took root in Kenya at the turn of the 20th century with the portioning of Africa by the European imperial powers. The first bank to establish operations was the National Bank of India which started a branch in Mombasa in 1896. By 1972, there were a total of twelve commercial banks operating in the Kenyan market. According to the CBK, Economic Survey (2007), there are 45 commercial banks, 2 mortgages firm institutions, 1 NBFIs and 1 building society. There are 95 foreign exchange bureaus operating in the Kenyan Market according to the review.

According to CBK, Economic Survey (2007), the banking sector has witnessed re-packaging of banking and financial services to satisfy the ever changing needs of customers. This has resulted in the rapid growth of consumer banking products. More banks are increasingly offering new banking products such as the unsecured personal loans, auto loans, unsecured professional loans, Safari savings accounts, Jumbo junior accounts among others. An increased number of institutions are offering e-banking as well as offering services for non – residents.

2.2 NON PERFORMING LOANS IN KENYAN BANKING SECTOR

According to CBK (2004), the balance sheet of the banking sector expanded with total assets increasing by 14% to ksh.546 billion as at end of June 2004 from Ksh.477.7 billion in June 2003. Loans and advances rose by 19% mainly due to reduced lending rates and increased lending by commercial banks of particularly un secured personal loans following aggressive marketing campaigns. NPLs were estimated at Ksh.72.6 billion or 24% of all loans at the end of June 2004, compared to ksh.75.4 billion or 28% as at June 2003. The relative decline in NPLs was attributed to be the repayment and write-offs of previously non-performing advances and decrease in new lending.

2.2.1 CAUSES OF NPLS

According to CBK Annual Report (2004), the following are the causes of NPLs,

(i) Poor and unprofessional credit evaluation

With due respect to lending decisions made in the past by the financial sector, a lot of emphasis has been on security than other similar important considerations. There are instances in the past when it was easier to get a loan from financial institutions as long as the borrower has security to be charged than the ability to service the loan. Cash flow projections, viability of the projects, character of the borrowers, previous loan completion and ability to repay were not considered as important. Hence, a number of banks ended up with many NPLs due to incomplete, poor and unprofessional credit assessment and evaluation.

(ii) Adverse economic conditions

Kenyan economy has been performing very poorly in the last decade or so and continues to decline. This has to a large extent been a major contribution to the bad loan scenario.

(iii) Insider borrowing

Major shareholders, directors and members of staff in many instances contribute to NPLs because they are not subjected to normal objective credit assessment before disbursement of loans to them.

(iv) Political Patronage

The majority of debtors especially owe money to state owned banks and financial institutions are political debtors who borrow money with no intention of repayment. The implications of this scenario are serious considering the fact that most of the debt owed to these banks and financial institutions are in the hands of such people. The other issue is that, most of this money is not invested in productive activities. (Market Intelligence Banking Survey, 2001)

(v) Inability to enforce covenants

The courts have become a major bottleneck to the realization of securities by banks when failure in loan performances requires it. The required statutory notices to defaulters (three in number) take seven months. This dissuades banks from lending

and they take high valued collateral to cover the risks. Although banks give sufficient notices to sell securities, costly and inefficient delays are being occasioned by court injunctions given usually on the day of sale, stopping the realization (Hempel et al, 1994).

2.2.2 MEASURES OF ASSET QUALITY

NPLs are those loans that are not being serviced as per the loan contracts and expose the banks to potential losses, (CBK, Annual Report, 2004). A mismatch in management of major balance sheet items can cause banks to close down. Changes in the relative structure of assets and liabilities should be a conscious decision of banks policy makers and in most cases the board of directors.

According to Simonson et al (1986), what differentiates well managed banks from badly managed banks is the proportion of the delinquent loan books. Banks must do everything they can to minimize loan delinquency. This requires them to continuously review individual exposures in order to monitor loan quality and reduce losses.

The success of individual banks in Credit risk Management is largely reflected in the proportion of NPLS to gross lending. Asset quality which is measured by the Asset quality Ratio is an indicator of the level of NPLS, (Thygerson, 1995) it's calculated as follows,

$$\text{Asset quality ratio} = \frac{\text{Total NPLs}}{\text{Total Loans}}$$

The smaller the ratio, the better the assets quality.

2.3 RISK MANAGEMENT.

According to Al-Tamimi (2007), risk management is a cornerstone of prudent banking practice. All banks in the present day volatile environment are facing a large number of risks such as credit risk, Liquidity risk, foreign exchange risk, Market risk and interest rate risk among others, for this reason efficient risk Management is absolutely required. Carey (2001) indicates in this regard that risk management is more important in the financial sector than in other parts of the

economy. The purpose of financial institution is to maximize revenues and offer the most value to shareholders by offering a variety of financial services and especially by administering risks.

2.3.1 TYPES OF RISKS FACING COMMERCIAL BANKS

According to Old field and Santomero (1997), it has been argued that risks facing all financial institutions can be segmented into three separable types from a management perspective. These are, (i) risks that can be eliminated or avoided by simple business practices.

(ii) risks that can be transferred to other participants.

(iii) risks that must be actively managed at the firm level.

Bessis J. (1998) divides banking risks into six different categories. Liquidity risk, interest rate risk, insolvency risk, operational risk and credit risk. For a bank, liquidity risk is the point where the liquid assets that make up a buffer are diminished. The interest rate risk is when the earnings of a bank are at risk due to movements in the interest rate. This interest rate risk can be managed by hedging with various derivatives such as interest rate, futures and options. Market risk refers to the market deviations that may negatively influence the value of the portfolio during the liquidation period. Market risk can be handled with different derivatives and insurance products. The operational risks are the risks connected to day to day operation of the bank. The solvency risk is the risk of exposing the bank to situations where it is unable to cover its payment obligations. Credit risk is the risk that customers default, that is fail to comply with obligations to service debt. Credit risk is also the risk of a decline in the credit standing of counterparty.

According to Saunders (2002), other types of risks facing banks include country risk, event risk, and technological risk. Technological risk occurs when technological investments do not produce the anticipated cost savings in economies of scale. The objective of technological expansion is to lower operating costs, increase profits and capture new markets. Country risk occurs when repayment from foreign borrowers is interrupted because of interference from foreign governments. Event risk occurs due to sudden and unexpected changes in financial market condition because of war, revolution or sudden collapse, such as stock market crashes.

2.3.2 CREDIT RISK MANAGEMENT

The importance of credit Risk Management has never been more important with the current high default rates and bankruptcies. Indeed Banks and other financial institutions offering credit are spending considerable time in the subject because of the increased emphasis on sophisticated risk management techniques, refinement in credit scoring techniques, development of offensive credit mitigation techniques among others (Altman, 2002).

The largest source of credit risk is loans although credit risks exist in other activities of the institution. On average, the size of the loan portfolios constitutes 63% of the banks assets in Kenya. This renders Credit risk currently the most significant risk to the local banking sector. An effective and sound credit risk management is thus critical to the success of the sector (CBK, Risk Management Survey, 2004).

2.3.3 EFFECTIVE RISK MANAGEMENT

Butterworths (1990) asserts that, effective risk management in financial institutions is the key to the future success in banking. The risk management framework encompasses the scope of risks to be managed, the processes and procedures to manage risk and the roles and responsibility of individual involved in risk management. The framework should be comprehensive enough to capture all risks a bank is exposed to and have flexibility to accommodate any change in business activities.

An effective risk management framework should clearly define risk management policies and procedures covering risk identification, measurement, monitoring, reporting and control (Hempel et al, 1994). According to CBK, Bank Supervision Annual Report (2005), effective risk management requires managing credit risk across the loan portfolio on a loan to loan basis. Effective risk identification starts with the evaluation of individual Loans. Rating the risk of individual loans in timely credit evaluation is fundamental to loan portfolio management. According to the report, the elements of a sound risk management system includes the following,

- ❖ adequate board and management oversight.
- ❖ adequate policies, procedures and strategic lending goals including lending limits.

- ❖ adequate portfolio monitoring, risk assessment and management information system(M.I.S)
- ❖ comprehensive internal controls.

2.3.4 CHALLENGES TO SOUND RISK MANAGEMENT IN THE BANKING SECTOR IN KENYA

Several challenges have been identified by the CBK 2000 risk management survey. They include the following:

- ❖ Lack of appropriate systems that can monitor compliance with internal control policies and limits on timely basis.
- ❖ risk control functions and business operations are not well segregated, leading to conflict of interest in risk management.
- ❖ the presence of Board members who do not possess sufficient skills and knowledge to industrial banking risk, renders the Board less effective in risk management.
- ❖ limited source of good information on credit.
- ❖ Customers who at times give dishonest and inaccurate financial information.

2.4 CREDIT CONTROL

2.4.1 THE NEED FOR SOUND CREDIT POLICY.

According to Simonson et.al (1986) a sound credit policy would help improve prudential oversight of asset quality, establish a set of minimum standards to apply a common language and methodology (Assessment of risk, policy, documentation and ethics) for measurement and reporting of non-performing assets, loan classification and provisioning. The credit policy should set out the banks lending philosophy and specific procedures and means of monitoring the lending activity.

According to CBK (2005) in its risk management guidelines to commercial banks, an effective credit policy is the one that defines the credit concentration, limits and exposures the organization is willing to assume. These policies should be well documented to enable banks to take adequate measures to ensure concentration risk is mitigated. About policies on credit assessment, there must be a clear understanding of the borrower or counter-party and adequate

information must be obtained to enable a comprehensive assessment of the risk profile of the customer. Lack of adequate data and information in respect of a borrower would normally lead to poor lending decisions.

2.4.2 PRICING CREDIT RISK.

Spencer (1990) observes that because lending represents the central activity of banks and underpins their profitability, loan pricing tends to be the focal points of both revenues and costs. Sinkey (1992) states that in a competitive environment, interest rates charged by individual banks must be priced competitively taking into account credit risk and interest rates. The common practice in banks is to peg lending rates on the Treasury Bills rate. Each bank quotes a base rate which is normally equal to the T-bill rate plus 2 to 5 basis points, depending on the banks cost of funds and operating efficiency plus a premium based on perceived risk.

2.4.3 EARLY WARNING SIGNS OF LOAN DELIQUENCY

According to Rouse (2002), information which leads a lender to suspect that a borrower is in a financial difficulty can come from many sources but will usually arise from carrying out monitoring and control procedures. Some of the signs include late payment of principal and interest, unauthorized overdraft excess, significant changes in account turnover, hardcore balances, unpaid cheques, high gearing ratio, operating losses, abnormal delays in submitting financial statements, and unexplained change borrowers' attitude towards the bank among others. This information may be obtained from internal records through interviews with the borrowers, audited accounts and management accounts.

2.4.4 CONTROLLING LOAN LOSSES

Gill et al (1989) states that, credit analysis has not progressed to the point where it is possible to predict with absolute accuracy whether or not a loan will be repaid as agreed. Invariably commercial banks find a certain proportion of their loans become delinquent. According to Simonson et al (1986), the basic risk of the lending function is not entirely bad; commercial banks would be remiss in not bearing such risk in the course of underwriting a variety of business enterprises and consumer needs.

Sinkey (1992), states that commercial banks must maintain surveillance of its loans. The frequency of reviewing individual loan exposures depends on the size and quality of the loans. Large poor quality loans must be reviewed frequently. The importance of periodic loan review is that, the bank is able to detect actual or potential problem loans as early as possible and act on them appropriately. Once a loan exposure has been found to be facing difficulties, immediate action should be taken.

2.5 CREDIT RISK ASSESSMENT

Bank lending is an art as well as a science, whose success depends on technical knowledge and on an aptitude to assess both the credit worthiness of a potential borrower and the merits of the proposition to be financed (Kenneth Toft, 1986).

According to Saunders (1996), banks need to gather adequate information about potential customer's to be able to calibrate the credit risk exposure. The information gathered will guide the bank in assessing the probability of borrower default and price the loan accordingly. Much of this information is obtained during loan documentation. The bank can go beyond this information and seek additional information from third parties such as credit rating agencies and credit reference bureaus.

Rouse (1989) states that applying CAMPARI technique during initial assessment of the borrower will help in determining whether a loan is good or bad, recoverable or not recoverable. CAMPARI is a technique by which the viability of a proposal is assessed and evaluated. The acronym CAMPARI stands for Character (says a lot about the probability of a loan arrangement going sour), Ability (borrower's ability in managing financial affairs), Margin (the bank should obtain reasonable return in view of the risk taken), Purpose (the reason for application should be acceptable to the bank), Amount (there must be a justification for the amount requested), Repayment (the source of repayment should be clear), and Insurance (security is necessary in case the repayment proposals fail to materialize).

According to Pandey (2001), to estimate the probability of default in a customer, the credit manager should consider the following; Character, which is the customer's willingness to pay. The manager should judge whether the customers will make honest efforts to honor their credit obligations. The moral factor is of considerable importance in credit evaluation in practice. The

second is capacity which refers to the customer's ability to repay. This may be judged by assessing the customer's capital and assets which he may offer as security. The manager should determine the real worth of assets offered as collateral (security). The borrower's history may also be considered. The third is condition which refers to the prevailing economic and other conditions which may affect the customer's ability to pay. Adverse economic conditions can affect the ability or the willingness of a customer to pay. The fourth is capital, which refers to the financial resources obtained from financial records that a company may have in order to deal with its debt. Many analysts would make this portion the most important one. Weight is given to balance sheet items and components such as working capital, net worth and cash flow. The last one is collateral or guarantees as an additional form of security against the loan. This is the secondary form of repayment should the borrower be unable to repay.

According to Gwilym (2003), the process of credit risk assessment entails some form of credit scoring where each borrower is marked on a range of indicators thought to have some bearing on default risk. An overall score is then calculated and used to; place the borrower in an appropriate risk group. Indeed, according to Bessis.J. (1998), credit scoring models can be used in minimization of the credit risk attributable to an individual customer.

2.6 CREDIT SCORING

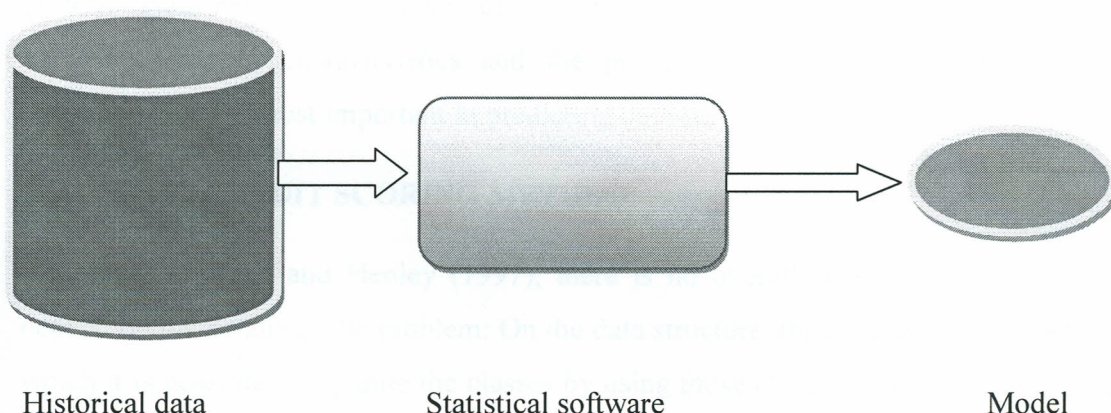
Credit scoring is a statistical method used to predict the probability that a loan applicant or an existing borrower will default or become delinquent. The method introduced in 1950's is now widely used for consumer lending, especially to credit card users and is becoming more widely used in commercial banks (Mester, 1997)

The information about the borrower is obtained from their loan applications and from credit bureaus. This may include applicants monthly income, out standing debt, financial assets, how long the applicant has been on same job, whether the applicant rents or owns a home, among others. Regression analysis relating loan performance to these variables is used to pick which combination of factors best predicts delinquency or default and how much weight should be given to each of these factors (Fair, Isaac). The process of credit scoring is very important for banks as they need to segregate 'good borrowers' from 'bad borrowers' in terms of their creditworthiness.

2.6.1 CREDIT SCORING MODELS

The methods generally used for credit scoring are based on statistical pattern recognition techniques. Credit scoring in its automated form is often the only way to assess creditworthiness, as banks do not have enough resources to treat each small exposure individually (Vojtek and Evzen, 2005).

To build a good scoring model, developers need sufficient historical data which reflects loan performance in periods of both bad and good economic times. During the model building process, the statistical application would use information about the existing customers to build and validate the model. In the end, the result is a model that would take details about the customer as inputs and generate an output (Hand and Henley, 1997).



Source: Scoring methods (Hand & Henley, 1997)

According to Abedi (2002), credit scoring models used by banks to improve risk assessment include the following, Linear Discriminant Models which divide borrowers into low or high default risk classes, contingent on their observed characteristics. It provides a score that separates potentially good loans from weak loans. Altman (1968), who was the first to apply this model, constructed the so called Z-score, which is a linear combination of several explanatory variables for the purpose of the corporate credit granting problem. The second category includes linear probability models which use past data such as accounting ratios as inputs into a model to explain repayment experience on old loans. The relative importance of the factors used in explaining past repayment performance are used to forecast probability on new loans. The third

category includes option pricing theory models which start with the observation that a borrower's limited liability is comparable to a put option written on the borrower's assets with strike option equal to the value of the debt outstanding. If in future, the value of the borrowers' assets fall below the value of the outstanding debt, then the borrower may default. The models infer the probability of a firm to default from an estimate of the firm's asset price volatility which is usually based on the observed volatility of the firm's equity prices. The fourth category is the risk adjusted return on capital models. This is a new credit risk model which measures how much risk the bank is taking. It helps to determine if returns are providing adequate compensation for risk and assesses if the bank is providing shareholders with value added through its participation in the business. The last are neural networks which is a mathematical representation inspired by the human brain and its ability to adopt on the basis of the inflow of new information. Mathematical, it's a non-linear optimization tool. According to Altman et al (1994), neural networks allow for some learning through experience to discern the relationship between borrower characteristics and the probability of default and to determine which characteristics are most important in predicting default.

2.6.2 BEST CREDIT SCORING METHOD

According to Hand and Henley (1997), there is no overall 'best' method. What is best will depend on the details of the problem: On the data structure, the characteristics used, the extent to which it is possible to separate the classes by using those characteristics and the objective of the classification.

Classification accuracy, however measured is only one aspect of performance. Others include the speed of classification, the speed with which a score- card can be revised and the ease of understanding of the classification method and why it has reached its conclusion. Neural networks are well suited to situations where we have a poor understanding of the data structure. This is because they combine automatic feature extraction with the classification process to yield estimates of the parameters (Hand, 1998).

2.6.3 BENEFITS OF CREDIT SCORING

Credit scoring is both faster and less expensive than traditional underwriting. It reduces the bank's loan processing time (Lawson, 1995). Reducing processing time reduces the personnel

cost per loan to the bank making small business loans more attractive and profitable. According to Somerville (1997), spending less time on routine loans may also allow loan officers to spend more time on marginal applicants that need individual attention.

Credit scores can also be used by lenders in monitoring loans. This reduces monitoring costs and allows banks to make loans outside their branch footprints, thereby reducing the cost of lending. Credit scoring may also be less costly in terms of time spent by applicants gathering the information needed to complete the application, because customers need only to provide the information used in the scoring system. This encourages applicants for smaller loan amounts (Mester, 1997).

Credit scoring improves the objectivity in loan approval process. The scorecard makes it easy for banks to document the relationship between the criteria and creditworthiness of the applicant in the case of factors having a disparate impact on a protected class of applicants (Mester, 1997). According to Douglas et al (1998), credit scoring allows the bank to accept the clearly good customers and reject the clearly bad customers very quickly. It also allows different loan processors to apply consistent standards across all credit applicants and makes changing of the standards very easy.

2.6.4 LIMITATIONS OF CREDIT SCORING

Individual with higher credit scores are offered different services than those with lower scores. Individuals with lower credit scores are targeted with sub prime loans bearing higher interest rates. (Mester,1997). He further adds that, the accuracy of the scoring systems for under represented groups is still an open question. The accuracy of the system will depend on the manner in which it was developed and that it works best when applied to large population of loan applicants (Douglas et al, 1998).

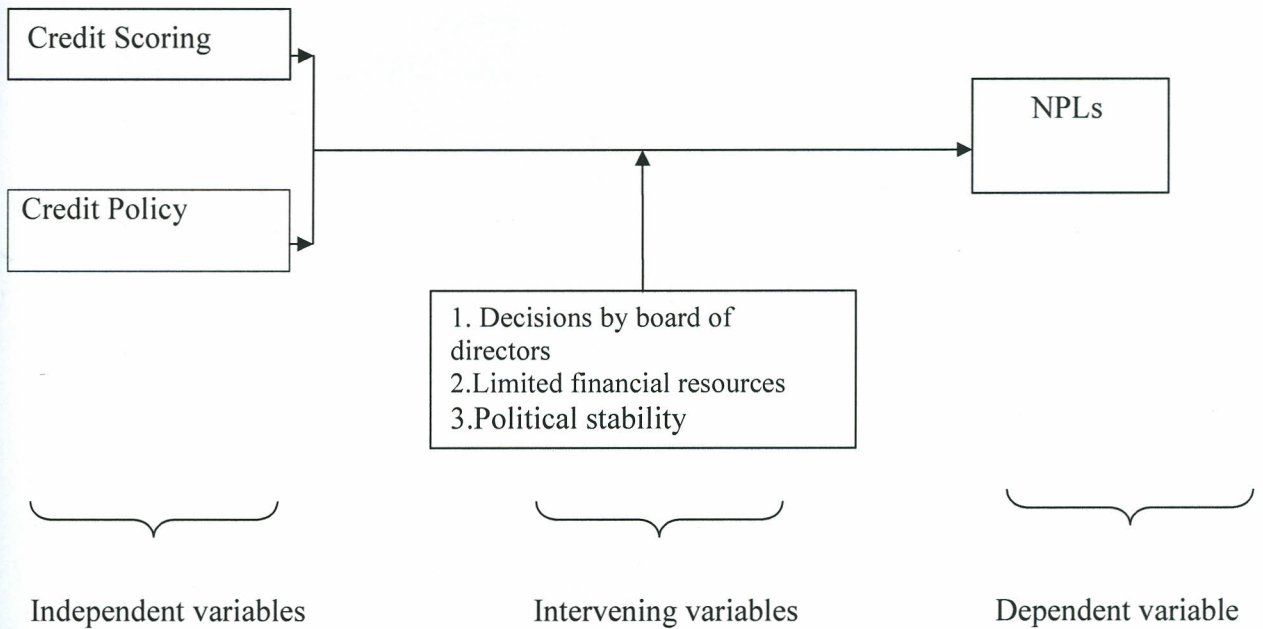
2.7 SUMMARY OF LITERATURE REVIEW

From the literature reviewed, there are shortcomings in the credit risk management within Kenyan commercial banks. It started by giving an overview on the Kenyan banking systems and NPLs and goes further to identify the causes of NPLs within Kenyan commercial banks. From literature reviewed, risk management has been identified as the cornerstone of prudent banking

practice. In the chapter, an indepth analysis and discussion on credit risk management and its importance to commercial banks has been undertaken. Credit risk assessment through credit scoring models has also been reviewed. From the literature reviewed , very little has been done by independent researchers on the above area in the Kenya and therefore , this study seeks to provide information on the current state with regard to credit scoring methods used by commercial banks in Kenya in carrying out credit risk assessment on its loan applicants.

2.8 CONCEPTUAL FRAMEWORK

The diagram below links credit scoring, credit policy and NPLs. From the literature reviewed in relation to credit risk assessment, the three factors have been dealt with in isolation and hardly any information is available that clearly links all of them.



(Source: Author, 2010)

From the diagram, credit scoring and credit policy are the independent variables while non performing loans is the dependent variable. The presence of intervening variables such as political stability in the country, decisions by the board of directors and limited financial resources adversely affect the effectiveness of credit risk assessment. To measure the level of non performing loans, asset quality ratio for each bank will be calculated. Credit policy and credit scoring will be measured using ordinal scale whereby the sum total of each bank responses to questionnaire items will be calculated in order to answer research questions of the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 INTRODUCTION

The aim of this chapter is to describe the data collection procedures and data analysis methods used in the study. The chapter is divided into the following parts; research design, target population, sample size and sampling strategy data collection procedures and data analysis techniques. Data collection procedures and analysis were employed in order to address the objectives of this study.

3.1 RESEARCH DESIGN

The research design used was descriptive because the study sought to analyse credit risk assessment through credit scoring models by the commercial banks in Kenya. It further sought to determine if there is any relationship between the use of credit scoring models and non performing loans. Also given the time, budget allocated and taking cognizance of the fact that educational research contains many variables that cannot realistically be controlled, then descriptive research design is the most appropriate. Indeed, Mugenda and Mugenda (1999) assert that descriptive research determines and reports the way things are.

3.2 TARGET POPULATION

The study population included all the 48 commercial banks operating in Kenya as listed by the CBK website (www.centralbank.go.ke). The study is a census hence the whole population of 48 commercial banks was included. A census was appropriate since the target population was small hence manageable.

The respondents were the personal banking officers, credit officers and loan analysts within the respective banks where one questionnaire per bank was administered through the headquarters of each bank. The respondents were selected based on their knowledge and experience in the respective banks. The information generated is assumed to be representative of the views of all the officers which they represent and is thus be regarded as sufficient to provide a holistic picture of the problem investigated.

3.3 DATA COLLECTION PROCEDURES

Data collected was both primary and secondary. Primary data was collected using questionnaires which were administered to the branch managers and loan officers in the various banks through the headquarters. The questionnaires were semi-structured and based on both open-ended and closed-ended questions of both substantive and theoretical nature. Secondary data was obtained from existing literature such as published annual reports, journals, books and other relevant publications.

3.4 DATA ANALYSIS TECHNIQUES

Completed questionnaires were reviewed and edited for completeness, coded, labeled and keyed into the computer for statistical analysis using the Statistical Package for Social Scientists (SPSS). Descriptive data analysis techniques have been used in form of frequency distribution tables, averages, percentages, graphs and tables to show the various findings. Asset quality ratio for the banks is used as the indicator of non performing loans. Correlation analysis is used to show the relationship between non performing loans and credit scoring practices. The methods were chosen because the data collected is in frequencies as the variables are measured in categorical scale and no assumptions are made about the data.

CHAPTER FOUR

PRESENTATION INTERPRETATION AND DISCUSSION OF THE FINDINGS

4.0 Introduction

This chapter describes the analysis of data and presents research findings. The results are presented in the form of frequency distribution tables and graphs.

4.1 Response rate

A total of 48 questionnaires were administered to the various banks and the results of the response rate are as shown in table 4.1 below.

Table 4.1 Response rate

Respondents	Frequency	Percentage (%)
Responded	33	68.75
Didn't respond	15	31.25
Total	48	100

The response rate was at 68.75% as out of the 48 respondents who were surveyed, only 33 responded as illustrated below in table 1. During the study, five banks indicated that they don't take questionnaires on issues pertaining their credit policies and operations.

DATA ANALYSIS AND INTERPRETATION OF RESULTS

4.2.1 Frequency of bank reviewing its credit policy

The respondents were asked to indicate the frequency of reviewing the banks credit policy and the results are shown in table 4.2.1 below

Table 4.2.1 Frequency of bank reviewing its credit policy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Quarterly	7	21.2	21.2	21.2
	Semi-annually	10	30.3	30.3	51.5
	Annually	16	48.5	48.5	100.0
	Total	33	100.0	100.0	

The frequency above indicates that 48.5% of the banks surveyed review their credit policy annually, 30.3% review credit policy semi annually while 21.2% review their credit policy quarterly. The study further established that, 69.7% of banks surveyed use regular staff meetings to create employee awareness on credit risk while 54% use

trainings, 48% use credit manuals to pass information on credit risk and 24.3 % of the banks surveyed use supervision at one to one basis to create employee awareness about credit risk.

4.2.2 Banks effectiveness in credit policy making

The respondents were asked to rate their respective banks' effectiveness in credit policy making and the results are shown in table 4.2.2 below

Table 4.2.2 Rating banks effectiveness in credit policy making

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	11	33.3	33.3	33.3
	Agree	19	57.6	57.6	90.9
	Disagree	3	9.1	9.1	100.0
	Total	33	100.0	100.0	

The table above indicates that, 33.3% of the respondents strongly agree that, their banks have effective and recognized leadership in credit policy making while 57.6% agree. However, 9.1% disagree that their banks have effective and recognized leadership in credit policy making.

4.2.3 Policies being clear and simple

Here, the respondents were asked to rate their respective banks on whether credit policies are clear and simple and the results are shown in table 4.2.3 below.

Table 4.2.3 Rating banks in terms of policies being clear and simple

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	13	39.4	39.4	39.4
	Agree	14	42.4	42.4	81.8
	Disagree	6	18.2	18.2	100.0
	Total	33	100.0	100.0	

From the frequency above, where the respondents were required to state whether policies within their banks were conceptually clear and simple to understand, 81.2% of the banks surveyed fall within the range of strongly agree and agree while 18.2% indicated that they are poor in formulating policies which are conceptually clear and simple. The inference then is that, in a significant number of banks the policies made are conceptually clear and simple to the implementers.

4.2.4 Policies being specific on who does what and how

Here, the respondents were asked to rate their respective banks on whether credit policies are specific on who does what and how and the results are shown in table 4.2.4 below.

Table 4.2.4 Rating banks in terms of policies being specific on who does what and how

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	15	45.5	45.5	45.5
	Agree	18	54.5	54.5	100.0
	Total	33	100.0	100.0	

From the frequency above, where respondents were required to state whether policies clearly specified on who does what and how in the banks, 45.5% of the banks surveyed strongly agree while 54.5% agree in having policies which are clearly specified on who does what and how. The deduction then is that majority of the banks have policies with defined roles and thus negligible conflicts during execution.

4.3 Credit scoring and credit risk assessment

This part of the study sought to gather information on the use of credit scoring models for credit risk assessment within commercial banks in Kenya. The results are as shown below

4.3.1 Banks use of credit scoring models

Here, the respondents were required to indicate whether their respective banks use credit scoring models for credit risk assessment and results are as shown in table 4.3.1 below.

Table 4.3.1 Use of credit scoring models in credit risk assessment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	20	60.6	60.6	60.6
	No	13	39.4	39.4	100.0
	Total	33	100.0	100.0	

From table above, where respondents were required to indicate whether their banks use credit scoring models for credit risk assessment, 60.6% of the banks surveyed indicated that, they use credit scoring models during credit risk assessment of the various loan applicants while 39.4% do not use any credit scoring models on credit risk assessment. The study established that other methods used to assess credit risk are credit committee and analysis of financial statements like balance sheet and the profit and loss accounts

incase of business loans. For personal loans, field observations on personal property and employment details are sometimes used.

4.3.2 Types of credit scoring models used by commercial banks

Here, the respondents were required to indicate the types of credit scoring models used for credit risk assessment and results are as shown in table 4.3.2 below.

Table 4.3.2 Credit scoring models used by commercial banks

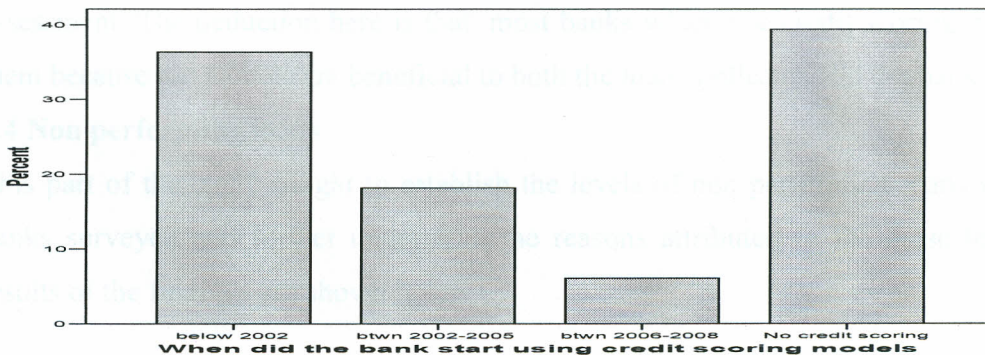
		% of respondents using the model
1.	Linear probabilistic models	27.3
2.	Linear discriminate models	21.2
3.	Risk adjusted return on capital models	60.6
4.	Option pricing models	30.3
5.	Neural networks	0

On the types of credit scoring models used, the study established that, risk adjusted return on capital model was the one mostly used by banks at 60.6%. However, it emerged that, some of the banks use two or more models in credit risk assessment depending on the types of loans being appraised. None of the commercial banks surveyed reported using neural networks for credit risk assessment. The study also established that, some banks use internally developed models for credit risk assessment. However, they were not willing to disclose details about the models as part of their business strategies.

4.3.3 When banks started using credit scoring models

Here, the respondents were required to indicate the years when their banks started using credit scoring models used for credit risk assessment and results are as shown in figure 4.3.3 below.

Figure 4.3.3 When banks started using credit scoring models



From the figure above, the respondents were required to indicate when the banks started using the credit scoring models. From the study, most of the banks(36.4%) started using credit scoring models before the year 2002, whereas 18.2% started using credit scoring models for credit risk assessment between 2002 and 2005 and 6.1% started using credit scoring models between 2006 and 2008. The remaining 39.4% do not use credit scoring models for credit risk assessment.

4.3.4 Reasons for using credit scoring models

Here, the respondents were required to indicate the reasons as to why their banks started using credit scoring models used for credit risk assessment and results are as shown in table 4.3.4 below.

Table 4.3.4 Reasons for using credit scoring models

Reason	% of respondents who use credit scoring models for the reason given.
Easy to apply	27.3
Its effective	48.5
Its beneficial to both customers and the bank	66.7
Its applied by our competitors	18.2
It's the bank's policy	57.6

Here the respondents were required to state the reasons why their banks use credit scoring models for credit risk assessment. From the results shown in the table above, 27.3% of the respondents use credit scoring models because they are easy to work with, 48.5 % because the models are effective, 66.7% because they are beneficial to both the customers and the bank, 18.2% because its applied by the competitors while 57.6% use credit scoring models because it's the bank policy to use credit scoring model for credit risk assessment. The deduction here is that, most banks which use credit scoring models use them because the models are beneficial to both the loan applicants and the bank.

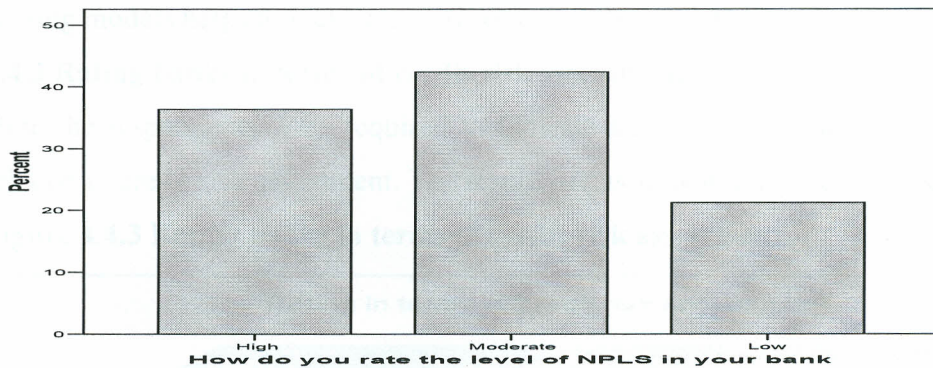
4.4 Non performing loans

This part of the study sought to establish the levels of non performing loans within the banks surveyed and further understand the reasons attributed to the those levels. The results of the findings are shown below.

4.4.1 Levels of NPLS

Here the respondents were required to state the levels of their respective banks as high, moderate or low. The results are as shown in figure 4.4.1 below.

Figure 4.4.1 Levels of NPLS

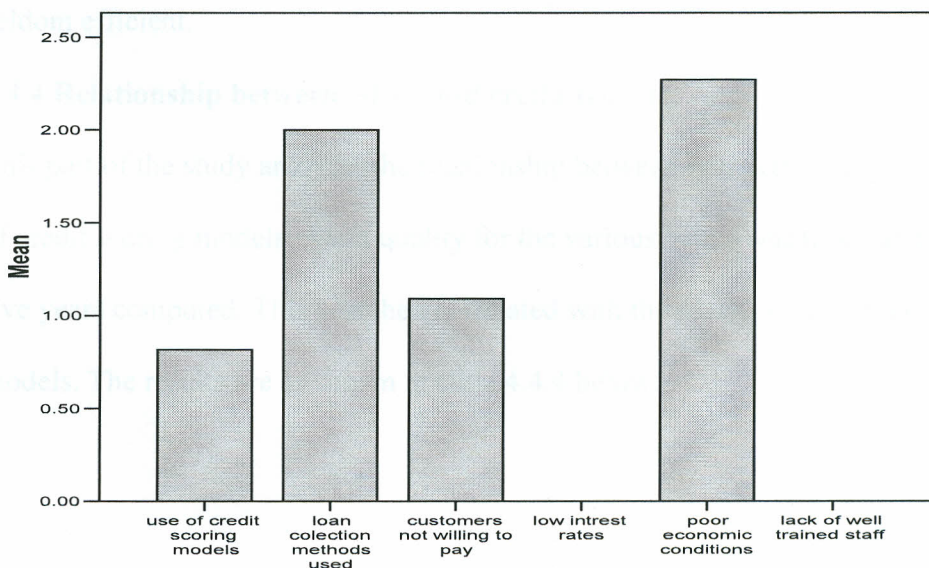


Banks assets are mainly loans and advances to customers. When loans become non performing, they hurt the banks liquidity and impact on its earnings. Asset quality ratio measures how much total loans is non performing and it tells whether or not the bank has been lending wisely. From figure above, most of the banks surveyed (42.4%) reported moderate levels of NPLs , 36.4% reported high levels of NPLs while 21.2% reported low levels of NPLs.

4.4.2 Reasons attributed to levels of NPLS

Here the respondents were required to state the reasons attributable to their banks non performing levels and the results are shown in figure 4.4.2 below.

Figure 4.4.2 Reasons attributed to levels of NPLS

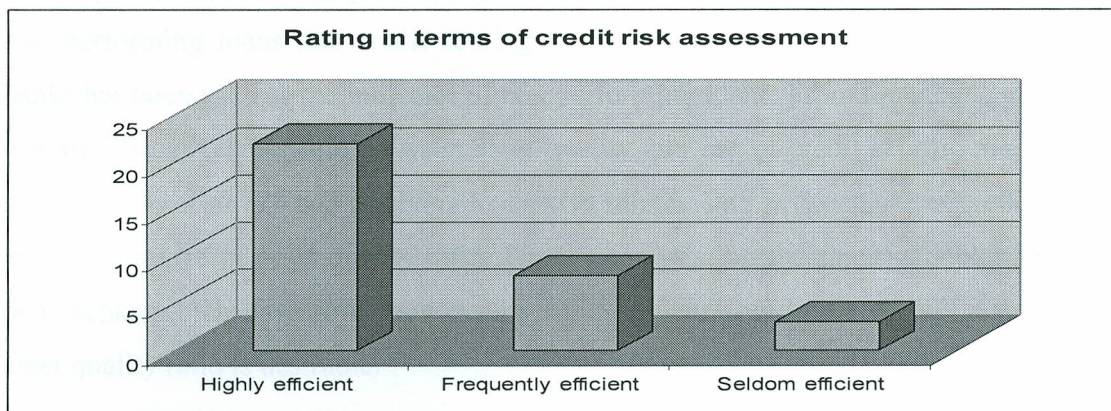


From figure above, loan collection methods used and ever changing economic conditions in the country were rated as the factors contributing greatly to the said levels of default rates. Customer's unwillingness to repay was rated third followed by use of credit scoring models I credit risk assessment. From this we can deduce that, indeed, use of credit scoring models helps to make credit worthiness determination more effective.

4.4.3 Rating banks in terms of credit risk assessment

Here the respondents were required to indicate how they generally rate their banks in relation to credit risk assessment. The results are as shown in figure 4.4.3 below.

Figure 4.4.3 Rating banks in terms of credit risk assessment



From figure above, most of the respondents (60%) rated their banks as being highly efficient in credit risk assessment, 28% were rated as frequently efficient while 12% was seldom efficient.

4.4.4 Relationship between NPLs and credit scoring

This part of the study analyses the relationship between non performing loans and the use of credit scoring models. Asset quality for the various banks was taken and an average of five years computed. This was then correlated with the results on use of credit scoring models. The results are as shown in table 4.4.4 below.

Table 4.4.4 Relationship between NPLs and credit scoring**Correlations**

		Asset quality	Credit scoring models
Asset quality	Pearson Correlation	1	-0.773
	Sig. (2-tailed)	0	0.5
	N	33	33
Credit scoring models	Pearson Correlation	-0.773	1
	Sig. (2-tailed)	0.5	0
	N	33	33

In this part correlation analysis has been conducted to establish the relationship between non performing loans and credit scoring models. Asset quality ratio of the respective banks has been used as the indicator of non performing loans. From the table above, there is a significant relationship between asset quality and use of credit scoring models. The correlation is at -0.773 and implying a negative relationship between use of credit scoring models and size of asset quality ratio. Further analysis, on the same variables indicated that, banks which have low asset quality ratio indicate low levels of NPLs thus a low asset quality ratio is desirable.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.0 INTRODUCTION

The purpose of this study was to examine the degree to which credit scoring practices are used within commercial banks in Kenya for credit risk assessment for loan applicants. This was with the view of determining which factors influence the use of credit scoring as a tool for credit assessment and further determine the relationship between NPLs and credit scoring practices. After data analysis, the conclusions of the study are outlined below.

5.1 CONCLUSIONS

The first research question sought to identify the credit scoring methods used by commercial banks in Kenya for credit risk assessment. After analyzing the collected data, risk adjusted return on capital model was the one mostly used by banks at 60.6%, linear probabilistic models at 27.3%, option pricing models at 30.3% and linear discriminate models at 21.2%. However, it emerged that, some of the banks use two or more models in credit risk assessment depending on the types of loans being appraised. None of the commercial banks surveyed reported using neural networks for credit risk assessment. The study also established that, some banks use internally developed models for credit risk assessment. However, they were not willing to disclose details about the models as part of their business strategies.

The second research question sought to determine the relationship between the use of credit scoring in credit risk assessment and the level of NPLs in commercial banks, where, asset quality ratio is used as the indicator for the levels of NPLs. The study established that, there is a significant relationship between asset quality and use of credit scoring models. The correlation is at - 0.773 and implying a strong negative relationship between use of credit scoring models and size of asset quality ratio. Further analysis, on the same variables indicated that, banks which have low asset quality ratio indicate low levels of NPLs thus a low asset quality ratio is desirable

5.2 RECOMMENDATIONS

After undertaking the research, analyzing data collected and interpreting the findings, it was clear that , banks that use credit scoring models during credit risk assessment reported lower levels of NPLs thus this study recommends that , banks should embark on credit assessment systems which are able to give as much information about the borrower as possible. Credit scoring will help banks achieve effective credit risk assessment thus determine the borrower's credit worthiness easily.

5.3 SUGGESTION FOR FURTHER STUDY

This research was based on primary data collected through questionnaires and secondary data from financial statements from the various commercial banks. As the most of the data collected was of a self report nature, there is a possibility that it is prone to some degree of subjectivity. Consequently further research can be done on the same area of credit risk assessment through credit scoring but in this case multiple sources of data both in the form of quantitative and qualitative data can be used. This may be data from archival bank records to provide more information on credit scoring and which should be supplemented with primary data in order to have up-to-date facts and give a broader picture.

REFERENCES

- Abedi . J. (2000). **Highway to success**. *Credit Management Journal* . Vol.9 No.23
- African Banking. (2002). **Improving Credit Risk Management Practices**. Washington policy Associates Inc. Cambridge
- African Banking. (2002).**Poor Credit risk management**. Washington policy Associates Inc. Cambridge
- Al- Tamimi. H . (2007). **Study of Bank`s Risk Management: A comparison UAE National and Foreign Banks**. *Journal of Risk Finance*. Vol.8 No.4. Emerald Group Publishing ltd
- Al-Tamimi . H. (2002). **Risk Management Practices: An empirical analysis of UAE commercial banks**. . *Journal of Risk Finance*. Vol.6 No.3. Emerald Group Publishing ltd
- Altman .E. (1968). **Financial ratios, Discriminant analysis and the prediction corporate Bankruptcy**. *Journal of Finance* .Vol.23
- Altman .E. (1994). **Corporate distress diagnosis: comparisons using linear discriminant analysis and neural networks**. *Journal of banking & finance*. Vol. 18
- Altman .E. & Narayanan.P. (1997). **An international survey of business failure classification models**. Financial markets, institutions and instruments.
- Bessis Joel (1998). **Risk management in banking**. John Wiley & sons ltd. First edition.
- Buterworths (1990). **Risk management: A modern perspective**. McGraw Hill Publishers
- Carey. A. (2001) .**Effective risk management in financial institutions: The Turnbull approach**. . *Journal of Risk Finance*. Vol.9 No.3. Emerald Group Publishing ltd
- Douglas R. Emory et al. (1998). **Principles of financial management**. First edition. Prentice hall, Inc
- Fair, Isaac and Company Inc. (1996). **Low to moderate income and high minority area case studies**
- Gwilym Pryce. (2003).**Worst of the good and best of the bad**. *Journal of property Investment and Finance*. Vol.21 No.6
- Greuning H.V and Bratanovic S. (1999). **Analyzing banking risk: A framework for assessing corporate Governance and Financial risk management**. Published by World Bank
- Gill and Reed. (1989). **Commercial Banking**. Prentice Hall
- Hand D.J. (1998). **Intelligent Data Analysis: Issues and opportunities**

- Hand D.J. and Henley W.E. (1997). **Statistical classification methods in consumer credit scoring: A review.** *Journal of the Royal Statistical Association Series*
- Hempel G.A (1994). **Bank management: Text Cases.** Fourth edition. John & Sons Inc.
- Kenneth Toft (1986). **Introduction to banking.** First edition. Heinemann. London
- Lawson (1995). **Knowing the score.** US Banker
- Maina T.C. (2006). **Key success factors in Kenyan banking industry.** An unpublished MBA project. University of Nairobi.
- Market Intelligence Banking Survey (2001). **A comprehensive Analysis and ranking of 46 Kenyan Commercial banks**
- Market Intelligence Banking Survey (2003). **A comprehensive Analysis and ranking of 46 Kenyan Commercial banks**
- Market Intelligence Banking Survey (2004). **A comprehensive Analysis and ranking of 46 Kenyan Commercial banks**
- Market Intelligence Banking Survey (2005). **A comprehensive Analysis and ranking of 46 Kenyan Commercial banks**
- Mester Loretta J. (1997) **“What’s the point of Credit scoring?”** Business Review. Federal Reserve Bank of Philadelphia
- Metropol (2002). **Where does KCB go from here?** Monthly magazine. November / December
- Ministry of finance-government of Kenya (2004). **Risk management Survey** .Central Bank of Kenya
- Ministry of finance- government of Kenya (2000). **Annual bank supervision report** .Central Bank of Kenya
- Ministry of finance- government of Kenya (2004). **Annual bank supervision report** .Central Bank of Kenya
- Ministry of finance- government of Kenya (2005). **Annual bank supervision report.** Central Bank of Kenya
- Ministry of finance- government of Kenya (2004). **Economic survey** .Central Bank of Kenya
- Ministry of finance- government of Kenya (2007). **Economic Survey** .Central Bank of Kenya
- Ministry of finance- government of Kenya (2009). **Monthly economic review, January, 2009** .Central Bank of Kenya
- Mudegu Evelyn (2003). **An investigation into the extent of utilization of credit management techniques in managing mortgage loans.** An unpublished MBA project. Kenyatta University.

- Mugenda O.M and Mugenda A.G (1999). **Research methods : Quantitative and Qualitative approaches**. Africa centre of technology studies, Nairobi, Kenya.
- Mutwiri M.J (2006). **Diversity management practices of commercial banks in Kenya**. An unpublished MBA project. University of Nairobi
- Obiero .D. (2002). **The banking sector regulatory framework in Kenya**. An unpublished MBA project. University of Nairobi
- Oldfield G. S and Santomero A.M (1997). **Risk management in financial institutions**. Sloan management Review .Vol. 39 No. 1
- Pandey .I.M (2002). **Financial Management**. Eighth edition. Vikas Publishing house PVT ltd
- Peter S. Rose (2002). **Commercial bank management**. Fifth edition. McGraw Hill. Irwin
- Rouse N. (2002) **.Applied lending techniques**. Second edition. Financial world publishing
- Saunders (1996) **Financial Institutions Management**. A modern perspective. Third edition. McGraw Hill.
- Simonson H.J and Johnson T. (1986).**Bank Management**. Third edition. New York
- Somerville Mary (1997).**Credit scoring and small business lender**. Commercial lending review.
- Spencer A.G. (1999) **.Managing commercial banks: Regional and global**. Prentice hall international. New Jersey
- Sridhar M. (2008). **Research design and plan**. Library and documentation division of ISRO satellite centre, Bangalore.
- Thygerson P. (1995). **Management of Financial institutions**. Harper Collins college publishers
- Vojtek M. and Evzen K. (2005) **Credit scoring methods**.
- Yusuf .A.Darus (2005). **A survey of operational risk management practices by Kenyan commercial banks**. An unpublished MBA project. University of Nairobi

APPENDIX 1

STUDY QUESTIONNAIRE FOR ALL COMMERCIAL BANKS IN KENYA.

This questionnaire will help in gathering information about credit scoring practices and non performing loans in the Kenyan commercial banks. All the information gathered will be treated with highest confidentiality and will be appreciated.

Please tick (✓) where appropriate

BACKGROUND INFORMATION.

1. POSITION IN BANK: _____
NAME OF BANK _____
2. YEAR OF ESTABLISHMENT: _____

PART A: CREDIT POLICY.

3. How regularly does your bank review its credit policy? Please where appropriate.
Quarterly
Semi-annually
Annually
Others, specify _____
4. Through what ways does the bank make employees aware of credit risk? Tick where applicable.

	Always.	Sometimes	Seldom	Never.
Regular Meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regular Training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Through Supervision on one to one basis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Credit Manuals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, specify _____				

5. On a scale of 1-4 how can you rate your bank in terms of the following
1=Strongly Agree 2=Agree 3=Disagree 4=Strongly Disagree

	1	2	3	4
(i) Policies are conceptually clear and simple	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(ii) Policies are clearly specified on who does what and how.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(iii) There is effective and recognized leadership in credit policy making in the bank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(iv) Policies operational goals are clear, flexible and				

- Easily understood
- (v) The impact of credit risk policies is evaluated
- At specified intervals

PART B: CREDIT SCORING AND CREDIT RISK ASSESSMENT

6. (a) Does your bank use any credit scoring model in credit risk assessment? Tick where appropriate YES NO

(b) If yes in 6(a) above please indicate which models you use.

Linear probability models

Linear discriminate models

Risk adjusted return on capital model

Option – pricing models

Neural Networks

Any other, specify _____

(c) When did the bank start using this (these) credit scoring models?

Year: 2000

2001

2002

2003

2004

2005

2006

Other specify _____

(d) Why does the bank use the credit scoring model(s) indicated above?

Easy to apply

It is effective

Beneficial to both customers and the bank

Its applied by our competitors

Bank policy

Other, specify _____

(e) If no in 6a above, please indicate any other method(s) that you use in credit risk assessment? _____

7. If any credit scoring model is used please indicate which type of loans it's used to assess.

Personal loans

Business loans

Corporate loans

Credit Cards

Any other specify _____

8. a) which characteristics among the following does your bank consider in credit scoring models before availing credit incase of personal loans? Tick where applicable.

1. Age

2. Years in employment

3. Income Per annum

4. Debit ratio

5. Other sources of income

6. Permanent address

- 7. Residential address ()
- 8. Marital Status ()
- 9. Existing credit facilities ()
- 10. Repayment History ()
- 11. Purpose of the Loan ()
- 12. Previously applied for the same ()
- 13. Repayment period ()
- 14. Collateral/security ()

Other(s), specify _____

8.b) which characteristics among the following does your bank consider in credit scoring models in case of business and corporate loans?

Character of borrower

	Least considered	Mostly considered
Customer willingness to repay	()	()
Past repayment experience	()	()
High credit discipline	()	()
Past performance in repayment	()	()
Other(s), specify _____		

Capacity

Cash in bank	()	()
Projected cash earnings	()	()
Business skills	()	()
Other(s), specify _____		

Conditions

Poor economic conditions () ()

Interest rates prevailing in the economy () ()

Inflation levels in the economy () ()

Other(s), specify _____

Collateral/Security

Asset types () ()

Capital invested () ()

Size of security () ()

Cash in bank () ()

Other(s), specify _____

9. Who formulates your credit scoring models?

Executive management ()

Board of directors ()

Credit managers ()

Credit analysis ()

Credit committee ()

Other(s),
Specify _____

10. How do you rate the level of NPLS in your bank?

High () Moderate () Low ()

11. What do you think has contributed to this performance with regard to NPLS?

Use of credit scoring models ()

- Loan collection methods used ()
- Customer not willing to repay ()
- Low interest rates ()
- Poor economic conditions ()
- Lack of well trained staff ()

Other (s), Specify _____

12. Kindly indicate your bank's default rate at any given time?

- 0%-10% of the loan portfolio ()
- 11%-20% of the loan portfolio ()
- 21%-30% of the loan portfolio ()
- 31%-40% of the loan portfolio ()

Other, Specify _____

13. How do you rate your bank in terms of the following?

	Highly Efficient	Frequently Efficient	Seldom Efficient	Never Efficient
(i) Credit Risk Management	()	()	()	()
(ii) Credit risk assessment	()	()	()	()
(iii) Managing problem loans	()	()	()	()
(iv) Making relevant Credit risk Management policies	()	()	()	()

APPENDIX 2

WORK PLAN

ACTIVITIES

TIME

Proposal writing	Five weeks
Proposal correction	One week
Defense of proposal	One day
Pilot study	One week
Data collection	Three weeks
Data analysis	Four weeks
Compiling the report	Three weeks
Submission of report	One day

SCHEDULE OF ACTIVITIES

ACTIVITY	WEEK											
	1	2	3	4	5	6	7	8	9	10	11	
Pilot study												
Data collection												
Data analysis												
Report compiling												
Report submission												

APPENDIX 3

BUDGET

	COST (ksh.)	TOTAL (ksh.)
PROPOSAL WRITING		
Typing 45 pages@sh.30	1350	
Photocopy @ sh.2.00	630	
Spiral binding @ sh.40	280	
Transport and miscellaneous	5000	<u>7260</u>
PILOT STUDY		
20 copies of questionnaires @sh12	240	
Transport and miscellaneous	3000	<u>3240</u>
DATA COLLECTION		
30 copies of questionnaires @sh.12	360	
Transport and miscellaneous	5000	<u>5360</u>
DATA ANALYSIS		
Data analysis services	3000	
Transport and miscellaneous	4000	<u>7000</u>
PROJECT WRITING		
Typing 80 pages @ sh.30	2400	
Photocopy @sh.2.00	960	
Binding @sh.100	600	
Transport and miscellaneous	4000	<u>7360</u>
		<u>30,220</u>

APPENDIX 4

LIST OF BANKS

- 1.African Banking Corporation
- 2.Bank of Baroda
- 3.Bank of India
- 4.Barclays Bank of Kenya
- 5.CFC Bank
- 6.Chase Bank Ltd
- 7.Citibank ltd
- 8.City Finance Bank
- 9.Co-operative Bank of Kenya
- 10.Commercial Bank of Africa
- 11.Consolidated Bank of Kenya Ltd
- 12.Credit Agricole Indosuez
- 13.Credit Bank Ltd,
- 14.Delphis Bank
- 15.Development Bank of Kenya,
- 16.Diamond Trust Bank
- 17.Dubai Bank Kenya Ltd
- 18.EABS Bank Ltd
- 19.Equatorial Commercial Bank Ltd
20. Equity Bank
21. Family Bank Ltd
- 22.Fidelity Commercial Bank Ltd
- 23.Fina Bank Ltd
- 24.First American Bank of Kenya
- 25.Giro Commercial Bank Ltd
- 26.Guardian Bank
- 27.Habib Bank A.G. Zurich
- 28.Habib Bank Ltd
- 29.Housing Finance Co. Ltd
- 30.Imperial Bank, Nairobi
- 31.Industrial Development Bank
- 32.Investment & Mortgages Bank Ltd
- 33.K-Rep Bank Ltd
- 34.Kenya Commercial Bank Ltd
- 35.Middle East Bank
- 36.National Bank of Kenya
- 37.National Industrial Credit Bank Ltd
- 38.Oriental Commercial Bank Ltd
- 39.Paramount Universal Bank Ltd
- 40.Prime Bank Ltd
- 41.Prime Capital and Credit Ltd
- 42.Southern Credit Banking Corp. Ltd
- 43.Stanbic Bank Kenya Ltd

- 44. Standard Chartered Bank
- 45. Trans-National Bank Ltd
- 46. Victoria Commercial Bank Ltd
- 47. Prudential Bank
- 48. Trust Bank

APPENDIX 5

INTRODUCTION LETTER

KIOKO PETER MWANZIA
KENYATTA UNIVERSITY,
SCHOOL OF BUSINESS,
P.O BOX 43844,
NAIROBI.

Dear sir/madam,

RE: PERMISSION TO CONDUCT RESEARCH

I am an MBA student at Kenyatta University, undertaking a research project as a partial fulfillment of the MBA degree. I am researching on Credit risk assessment through Credit Scoring models among commercial banks in Kenya.

I am therefore seeking your assistance in providing the necessary information in the above areas. Any information collected will be treated strictly and solely for academic purposes.

Your cooperation will be highly appreciated.

Yours faithfully,

Kioko P.M

APPENDIX 6

List of banks and credit scoring models used

No.	Name of bank	Credit model used
1.	Barclays	Risk adjusted return on capital, Linear probabilistic, Option pricing
2.	Kenya commercial bank	Risk adjusted return on capital, Option pricing, Linear discriminate, Linear probabilistic
3.	Diamond trust	Risk adjusted return on capital, Linear discriminate, Linear probabilistic
4.	Commercial bank of Africa	Risk adjusted return on capital, Option pricing, Linear probabilistic
5.	National bank of Kenya	Risk adjusted return on capital, Option pricing, Linear discriminate
6.	Fidelity	Risk adjusted return on capital, Option pricing, Linear probabilistic
7.	StandardChartered	Risk adjusted return on capital, Linear probabilistic
8.	Krep	Risk adjusted return on capital Linear discriminate
9.	Bank of India	Risk adjusted return on capital, Linear discriminate
10.	Dubai	Risk adjusted return on capital, Linear probabilistic
11.	Fina	Risk adjusted return on capital, Linear probabilistic
12.	Paramount	Risk adjusted return on capital ,Option pricing
13.	Co-operative	Risk adjusted return on capital, Linear probabilistic
14.	Oriental commercial	Risk adjusted return on capital, Option pricing
15.	City finance	Risk adjusted return on capital, Option pricing
16.	Victoria Commercial	Risk adjusted return on capital ,Option pricing
17.	Investments and mortgages	Risk adjusted return on capital, Linear discriminate
18.	Consolidated	Risk adjusted return on capital
19.	Imperial	Risk adjusted return on capital
20.	Family	Risk adjusted return on capital
21.	Transnational	None
22.	Prudential	None
23.	Delphis	None
24.	Fidelity commercial	None
25.	Consolidated	None
26.	Credit bank	None
27.	Prime bank	None
28.	Equatorial commercial	None
29.	National industrial credit	None
30.	Credit agricole	None
31.	Prime capital and credit	None
32.	First American bank	None
33.	Equity	None