AN INVESTIGATION OF RISK ASSESSMENT TECHNIQUES APPLIED BY COMMERCIAL BANKS IN KENYA

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DECLARATION

This research is my original work and has never been presented for a degree in any other university.

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DEDICATION

First is to thank the Almighty God who has made it possible for me to undertake my studies and who has brought me this far.

I would like to dedicate this project to my wife Lucy and my son Curtis. You stood by me throughout the course of my studies more so as i undertook this project. Your understanding, humility and patience for all the time I spent home and away working on this project. God bless you abundantly.

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ABSTRACT

The goal of this study was to investigate the risk assessment techniques being applied by the commercial banks in Kenya a well as evaluate the risk exposure level of the commercial banks in Kenya. Risk assessment involves the process of identifying, measuring and prioritizing risk. It is the first step in a risk management process. It's used to which determine the quantitative and qualitative value of risk related to a concrete situation and a recognized threat or hazard. There is need for Kenyan banks to put in place workable and efficient risk assessment techniques. Having an efficient risk assessment systems increases the likelihood of banks success, reduces possibility of bank failures and limits the uncertainty of the overall financial performance to preventing banks from suffering unacceptable losses

This study was conducted through the use of a questionnaire with both structured and unstructured questions. The questionnaires were distributed to all the 44 commercial banks operating in Kenya as per the CBK data of 2008. Each bank was given two questionnaires so as to compare the variability of the results between the two from the same bank in ensuring data reliability. The outcome of the study indicated that Kenyan Banks have put in place various techniques suitable to their operating environment to check on risk that comes with lending of loans. The study was able to identify the causes of these risks and how the banks in Kenya are addressing them as well as the mitigation factors that they have put in place to ensure checks and controls.

In conclusion the study established a need for the banks to keep on updating their risk assessment techniques in line with the changing operational environment as well as global trends related to the banking industry. This will help ensure sustainability of these institutions and enable them handle emerging risks within the banking sector.

LIST OF ABBREVIATIONS

AMA:	Advanced Measurement Approach
APT:	Arbitrage Pricing Theory
BASEL:	Bank of International Settlement
CAPM:	Capital Assets Pricing Model
CBK:	Central Bank of Kenya
CMA:	Capital Markets Authority of Kenya
DBK:	Diamond Bank of Kenya
EAD:	Exposure at Default
EWS:	Early Warning Systems
KCB:	Kenya Commercial Bank
LGD:	Loss given Default
LRAs:	Liquidity risk assessments
NIC:	National Industrial Credit Bank of Kenya
PD:	Probability of Default
SGLs:	Speculative Grade Liquidity ratings
VaR:	Value at Risk

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

Risk assessment process is defined as that process by which businesses and organizations focus on critical areas of concern and prioritize their use of resources in order to maximize response and their recovery efforts (Oldfield et al 1997). According to Lore (2000), risk is the potential for loss underlying the value of an investment. It is any exposure to uncertainty that would adversely affect future business objectives, operations and ultimately profitability of the firm.

Risk assessment involves the process of identifying, measuring and prioritizing risk (Marco 2003). Banks are recurrently battling with an array of risks due to the nature of their business. This is more so as a result of the constantly changing environment which make these institutions prone to major opportunities as well as complex variable risks thus challenging the traditional approaches as to how to the banks risk assessment is conducted. This has resulted to banks having to constantly monitor the ever changing micro and macroeconomic environments so as to identify risks there in as well as find innovative ways of addressing them. Risk assessment process examines the most urgent business functions identified during business impact analysis. It looks at the probability and impact of a variety of specific threats that could cause a business disruption (CBK 2005).

There is a dictum in finance that "the greater the risk the higher the returns" this in itself makes the risk element both an opportunity and a threat to the organization. It's an opportunity because most risky business ventures tend to be also the most highly profitable ones. On the other hand, risk is viewed as a threat since it includes the possibility of losing all or part of the investment. This underscores the need for good risk assessment techniques. According to Venkat (2000), most business managers would agree that it is neither possible nor desirable to completely eliminate risk from the business preposition. What is required is the appreciation that all risks that arise from a particular business can adequately be addressed through proper risk management processes which can only succeed if proper risk assessment techniques are put in place.

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Having an efficient risk assessment system means increasing the likelihood of banks success, reducing the possibility of bank failure and limiting the uncertainty of the overall financial performance to prevent the banks from suffering unacceptable losses. These are those losses which could cause an institution to fail or significantly damage its corporate position.

Within the banking industry, there is the recognition that an institution need not engage in business in a manner that unnecessarily imposes risk upon itself, nor should it absorb risk that can be efficiently transferred to other participants. Rather, it should only manage risks at the firm level that are more efficiently managed there than by the market itself or by their owners in their own portfolios (LaWare 1993). Risk assessment is a first step in a risk management process. It is the determination of quantitative   or qualitative value of risk related to a concrete situation and a recognized threat or hazard (Wikipedia dictionary). Quantitative risk assessment requires calculations of two risk components namely the magnitude of the potential loss and the probability that the loss will occur.

Banking sector in Kenya is regulated under the Banking Act Cap 488 of the Kenyan laws. The act has mandated the CBK to foresee all the financial operations carried out by various financial institutions licensed under it. It is through this act that the CBK regulates the way the business is operated so as to safeguard the public interest from being exploited by the financial operators. It has set up minimum capital requirements whereby every financial institution maintains a core capital of not less than eight percent, and a total capital of not less than twelve per cent of the total risk adjusted assets plus risk adjusted off balance sheet items as may be determined by the CBK. These requirements are meant to safeguard the institutions against various risks that they may face especially the safeguarding of their customers interests in case the financial institution was to become insolvent.

Various studies have been conducted in the past related to the banking industry in Kenya. In her study, Bett (1992) conducted an empirical study on banks failure predictive model and found that most had good predictors of bank failures. Kathanje (2000) in his study focused on performance measures internal to the concerned commercial banks in Kenya. Obiero (2002) looked at the banking regulatory framework in Kenya and its adequacy in reducing bank failures. Kibera (2007)

conducted a survey of internal auditors risk management practices within the banking industry in Kenya. Cheserek (2007) looked into the determinants of bank failures. None of these studies looked into the techniques applied by the banks in assessing their business risks.

Kenyan economy being a developing economy needs to put proper mechanisms in the banking risk assessment techniques, so as to keep check of banking risk since it has past history of bank failures Kalani et al (2009). One of the repercussions of the failure to effectively address the risk factor in the banking business is that it more often leads to the bank failures of which one bank failure can have a contagion effect that will affect other banks leading to a mass failure of various banking institutions as witnessed during the Asian banking crisis (1997 - 1998).

In summary, Risk assessment is aimed at identifying how institutions assess various risks which they are faced with in the course of their operations so as to ensure that they are efficiently managed in order to minimize the adverse effects in the operational environment while maximizing the probable opportunities.

1.2   Statement of the Problem

Kenyan economy has suffered major bank failures in the past Kalani et al (2009). This has culminated into huge losses, both monetary and non monetary costs which accompany bank failures and the re-structuring of banks in terms of winding up costs. A total of 32 banks have been put under receivership since the year 1983 when the banking controls were introduced by the CBK. Some of these banks have failed while others merged to form "bigger" banks. Banking industry is constantly faced with diverse challenges and risks of which unless proper risk assessment is undertaken can cost them their hard earned businesses. There have been various calls globally for more reproductive approaches on risk assessment within financial institutions in order to prevent bank failures headed by Basel.

Past research's, have associated most of the bank failures as a consequence of the banks inability to effectively monitor and undertake effective risk assessment. Santomero et al (1997) stated that the problems which the banking industries face have to do with difficulties in accurately being in a position to evaluate and assess their risks. An effective risk assessment process should identify the risk concentration areas out of which institutions should identify the unacceptable

concentrations of risk as well as internal and external threats that could cause business disruption and assess their probability and impact. Once this has been done, these institutions should prioritize threats accordingly, provide information for risk control management strategy and stipulate an action plan as to how these risks will be addressed. A documented recommendation as to how these risks can be mitigated should then be provided to the respective institutions (CBK 2005).

Prior to the processing of Basel II, in 2004, by the Bank of International Settlement, (BASEL), and the subsequent publishing of CBK guidelines on risk management in August 2005 which gives guidelines as to how risk assessment should be undertaken, there were no formal guidelines. CBK has set up the minimum expected standard of any effective risk assessment system. It should at least identify unacceptable concentrations of risks also known as 'single points of failure', Identify internal and external threats that could cause business disruption, assess the probability and impact. It should also prioritize threats according to the institution as well as provide information for a risk control management strategy and an action plan for risks to be addressed. The regulator also called for the establishment of a risk department within the banking institutions to be headed by the risk manager whose work was to oversee the bank risk management practices. However, due to the diverse nature of risks within the industry, it emphasized that what it had laid out were just a minimum guidelines and the individual banks should have an elaborate system of dealing with these risks.

No documented study was found related to a survey aimed at assessing the risk assessment techniques being applied by various commercial banks operating within the Kenyan market. The regulator has set up what is expected outcome of any effective risk assessment system but the techniques being applied to achieve these results are yet to be identified in the market. This research is aimed at filling in this gap.

1.3 Objectives of the study
The objectives of this study were;

1. To investigate the risk assessment techniques applied by commercial banks in Kenya

2. To assess the risk exposure levels of commercial banks in Kenya

1.4 Significance of the study

This study will shed more light on the risk assessment techniques being applied by the commercial banks in Kenya to determine various diverse risks within the banking industry and how they compare with other techniques in the banking industry globally. Kenyan banks operate in a fast changing environment especially with e-commerce now being embraced globally. This has played a role in increasing the risks within the industry financial institutions have to find out more innovative techniques to determine the risk element and minimize possible losses.

This research has a possible value beyond academic purpose. There are several possible beneficiaries who can benefit from this study. Among them is the CBK which is mandated with the overseer role to spearhead and regulate the banking industry in Kenya. This research will enable it learn more about the risk assessment methodologies under application by various financial institutions of which it supervises. CMA can also benefit from this research whereby it can use the information derived from this research to evaluate the risk exposure level of the banks trading at the NSE and what this means to those investors with stocks in these institutions.

Commercial banks management teams are also possible beneficiaries of this research. the information derived can help them strengthen the current risk assessment techniques under application by learning how this is conducted elsewhere thus reducing the risk exposure level To the Prospective investors, the study can help provide information on the risk exposure levels they are subjected to while making a decision to invest in a particular banking institution. Other Beneficiaries include Commercial banks corporate governors who can use the information in their decision making process like in the appointment of the management team to deal with the issue of risk management to enable to organization mitigate against any possible losses, Credit Bureau Agencies will also benefit since the study will provide them information which they can use to advice their clients while making their investment decisions.

To the Academicians, the research will add value to the currently available body of knowledge on risk assessment systems within the banking institutions, thus provide additional data source on the

risk assessment techniques as well as lay ground for further research in the field. To the auditors, the research will highlight the risky areas which they can   carry further in-depth audit to asses risk exposure level of their respective organization. Lastly to the general public; the study will be a source of information which they can use while making decisions where to bank their money as well as provide them with the information to enable them understand the banking operations in Kenya.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter takes a review at the theoretical as well as the empirical theories related to risk within the banking industry. It looks at the global as well as local research's materials as to how risk assessment is being conducted and the techniques that have been put in place by various financial institutions who undertake the process. It also assesses what materials are available related to the risk assessment methodologies and their application levels by commercial banks in Kenya.

The chapter also takes a review on assessment of the risk models currently under usage which predominantly encompasses an analysis of the modeling assumptions and the estimation techniques of related inputs.

2.2 Theoretical framework of Risk

Risk is the possibility that returns will be less than those expected. In order to measure the risk, one has to consider the variability of returns on an investment in the firm. Risk measures are stated as in absolute terms known as alpha factor ($\sigma 2$ or σ). A measure of risk state is done through coefficient of variation (CoV = σ/expected value) (Horne 2001).

In banks which are trading theirs shares, risk is measured through the variability of stock returns whereas in the private firms it is measured through returns which are assessed through the variability of generated cash flows. The foundations of modern risk assessment and analysis are to be found in a seminal paper done by Harry Markowitz in 1952, based on his PhD dissertation at the University of Chicago. This concerned the principles of portfolio selection. He showed that rational investors select their investment portfolios using two basic parameters, expected profit and risk. While profit is measured in terms of the average rate of return, risk is measured in terms of how much returns vary around this average rate of return. The greater the variance, the higher the risk.

2.3   Portfolio Theory

Modern portfolio theory (MPT) or portfolio theory was introduced by Harry Markowitz with his paper "Portfolio Selection," which appeared in the 1952 Journal of Finance. Thirty-eight years later, he shared a Nobel Prize with Merton Miller and William Sharpe for what has become a broad theory for portfolio selection.

According to Watson et al (2007), Prior to Markowitz's work, investors focused on assessing the risks and rewards of individual securities in constructing their portfolios. Standard investment advice was to identify those securities that offered the best opportunities for gain with the least risk and then construct a portfolio from these. Following this advice, an investor might conclude that railroad stocks all offered good risk-reward characteristics and compile a portfolio entirely from these. Intuitively, this would be foolish. Markowitz formalized this intuition. Detailing mathematics of diversification, he proposed that investors focus on selecting portfolios based on their overall risk-reward characteristics instead of merely compiling portfolios from securities that each individually have attractive risk-reward characteristics. In a nutshell, inventors should select portfolios not individual securities. In a nutshell, inventors should select portfolios not individual securities.

If we treat single-period returns for various securities as random variables, we can assign them expected values, standard deviations and correlations. Based on these, we can calculate the expected return and volatility of any portfolio constructed with those securities. We may treat volatility and expected return as proxy's for risk and reward. Out of the entire universe of possible portfolios, certain ones will optimally balance risk and reward. These comprise what Markowitz called an efficient frontier of portfolios. An investor should select a portfolio that lies on the efficient frontier.

James Tobin (1958) expanded on Markowitz's work by adding a risk-free asset to the analysis. This made it possible to leverage or deleverage portfolios on the efficient frontier. This lead to the notions of a super-efficient portfolio and the capital market line. Through leverage, portfolios on the capital market line are able to outperform portfolio on the efficient frontier.

Sharpe (1964) formalized the capital asset pricing model (CAPM). This makes strong assumptions that lead to interesting conclusions. Not only does the market portfolio sit on the efficient frontier, but it is actually Tobin's super-efficient portfolio. According to CAPM, all investors should hold the market portfolio, leveraged or de-leveraged with positions in the risk-free asset. CAPM also introduced beta and relates an asset's expected return to its beta. Portfolio theory provides a broad context for understanding the interactions of systematic risk and reward. It has profoundly shaped how institutional portfolios are managed, and motivated the use of passive investment management techniques. The mathematics of portfolio theory is used extensively in financial risk management and was a theoretical precursor for today's value-at-risk measures (Horne (2001).

2.4   Capital Assets Pricing Model (CAPM)

CAPM was first published by William Sharpe in 1964. Published the capital asset pricing model (CAPM). Parallel work was also performed by Treynor (1961) and Lintner (1965). CAPM extended Harry Markowitz's portfolio theory to introduce the notions of systematic and specific risk. For his work on CAPM, Sharpe shared the 1990 Nobel Prize in Economics with Harry Markowitz and Merton Miller (Horne 2001).

CAPM considers a simplified world where:

- There are no taxes or transaction costs.
- All investors have identical investment horizons.
- All investors have identical opinions about expected returns, volatilities and correlations of available investments.

In such a simple world, Tobin's (1958) super-efficient portfolio must be the market portfolio. All investors will hold the market portfolio, leveraging or de-leveraging it with positions in the risk-free asset in order to achieve a desired level of risk.

CAPM decomposes a portfolio's risk into systematic and specific risk. Systematic risk is the risk of holding the market portfolio. As the market moves, each individual asset is more or less

affected. To the extent that any asset participates in such general market moves, that asset entails systematic risk. Specific risk is the risk which is unique to an individual asset. It represents the component of an asset's return which is uncorrelated with general market moves. According to CAPM, the marketplace compensates investors for taking systematic risk but not for taking specific risk. This is because specific risk can be diversified away. When an investor holds the market portfolio, each individual asset in that portfolio entails specific risk, but through diversification, the investor's net exposure is just the systematic risk of the market portfolio.

Systematic risk can be measured using beta. According to CAPM, the expected return of a stock equals the risk-free rate plus the portfolio's beta multiplied by the expected excess return of the market portfolio. Specifically, let Z_s and Z_m be random variables for the simple returns of the stock and the market over some specified period. Let z_f be the known risk-free rate, also expressed as a simple return, and let β be the stock's beta. Then where E denotes an expectation. Stated another way, the stock's excess expected return over the risk-free rate equals its beta times the market's expected excess return over the risk free rate.

$$E(Z_s) = z_f + \beta\big[E(Z_m) - z_f\big]$$

2.5   Arbitrage Pricing Theory (APT)

The Arbitrage Pricing Theory (APT) is a valuation model developed by Stephen Ross in 1976. It is a one-period model in which every investor believes that the stochastic properties of returns of capital assets are consistent with a factor structure. An APT is based on the idea that an asset's returns can be predicted using the relationship between that same asset and many common risk factors. The theory predicts a relationship between the returns of a portfolio and the returns of a single asset through a linear combination of many independent macro-economic variables. Ross argues that if equilibrium prices offer no arbitrage opportunities over static portfolios of the assets, then the expected returns on the assets are approximately linearly related to the factor loadings. The APT is a substitute for the Capital Asset Pricing Model (CAPM) in that both assert a linear relation between assets' expected returns and their covariance with other random variables and offers fewer assumptions (Goldenberg and Robin 1991).

The basis of arbitrage pricing theory is the idea that the price of a security is driven by a number of factors. These can be divided into two groups: macro factors, and company specific factors. The name of the theory comes from the fact that this division, together with the no arbitrage assumption can be used to derive the following formula:

$$r = r_f + \beta_1 f_1 + \beta_2 f_2 + \beta_3 f_3 + \cdots$$

Where: r is the expected return on the security, r_f is the risk free rate, each f is a separate factor and each β is a measure of the relationship between the security price and that factor.

This is a recognisably similar formula to CAPM. However, the difference between CAPM and APT is that CAPM has a single non-company factor and a single beta, whereas APT separates out non-company factors into as many as proves necessary. Each of these requires a separate beta. The beta of each factor is the sensitivity of the price of the security to that factor. APT does not rely on measuring the performance of the market. Instead, APT directly relates the price of the security to the fundamental factors driving it. The problem with this is that the theory in itself provides no indication of what these factors are, so they need to be empirically determined. Obvious factors include economic growth and interest rates. For firms in some sectors other factors are obviously relevant as well such as consumer spending for retailers. The potentially large number of factors means more betas to be calculated. There is also no guarantee that all the relevant factors have been identified. This added complexity is the reason arbitrage pricing theory is far less widely used than CAPM (Megginson 1996).

As for the use of APM, it posits a multi-linear relationship between the returns of an asset and the returns of a set of multiple unknown economic factors. APM betas usually measures unknown economic factors driving asset returns, standardized covariance's between the individual security return and the unknown factor values as well as the sensitivity of a change in the return on a single security to the changes in the set of factors included in the model Watson et al (2007).

Franco Modigliani and Merton Miller (1958) work indicated that the value of the firm cannot be changed in a perfect capital market with no corporate or income taxes. The implication of this was

that the value of the firm cannot change by assuming greater debt despite the fact that the expected cost of debt is lower than the expected cost of equity. Increasing leverage means increasing the financial risk of the firm

2.6   Bank of International Settlement (BASEL) I and II

Founded in 1930, it's the world's oldest international financial institution and remains the principal centre for international central bank cooperation. It fosters cooperation among central banks and other agencies in pursuit of monetary and financial stability.

BASEL came up with the first accord in 1988, otherwise referred t as BASEL I. However as part of the pursuit to achieve its goals, they convened the Basel Committee on Banking Supervision where they reached an agreement on a number of important issues relating to the "New Basel Capital Accord" as is commonly known, and referred to, as "The Basel II Accord". It was intended to supersede the existing Capital Accord introduced in 1988. It was anticipated to come into force in 2006 (originally 2004). It sets out a detailed scoring process for risk assessment which is based on aggregate data collected by banks. The aim of Basel II was to introduce a more risk-sensitive capital framework, and incentives for the implementation of good risk management practices by the banks. Basel II revolves around three pillars (BASEL 2005).

The first Pillar is centered on Minimum capital requirements accompanied by the setting of an operational risk charge and a more detailed credit risk measurement methods. The Second Pillar is on Supervisory review process. The aim was to identify whether each bank has sound internal processes in place for them to assess their capital adequacy. The Third Pillar is on market discipline. It aims to bolster market discipline through enhanced disclosure by banks. The various risk types mentioned under Basel II are credit risk, liquidity risk, Market Risk, strategic risk, foreign exchange risk, interest rate risk, price and commodities risk.

2.7   Benefits of Kenyan Banks Adopting Basel II

The level of benefit to be gained from adopting Basel II is dependent upon the degree of detail to which different banking institutions assess their capital and operational risk. The greater the

degree of detail of the assessment, the greater the potential benefits. However, they are likely to incur greater cost, both at the initial set-up and in maintenance level. As a result, the expenditure needs to be weighed against the projected benefit when considering how precise the assessment is to be. Basel II will be beneficial for the banking sector since it will lead to better analysis of capital requirements, improved risk management, more efficient operations and higher revenues. Increased detail of the risk status of clients will enable institutions to make a more informed decision on whether to accept or decline business thus better management of risk-based processes thus enable banks to reduce losses incurred through credit lending.

2.8 Empirical Literature on Risk and Risk Assessment Techniques

There has been a significant rise in the activities within the banking sector in Kenya. Surprisingly, in a survey conducted by the CBK (2005), a number of financial institutions have no risk management frameworks according to the survey; banks that gave loans without proper documentation are finding the loans difficult to recover. They have now shifted away from security based lending to the emphases on the customers ability to meet the loan repayments.

2.8.1 Credit risk Assessment Techniques

Credit risk is the current or prospective risk to earnings and capital arising from an obligor's failure to meet the terms of any contract with the bank or if an obligor otherwise fails to perform as agreed. It is the largest and the most elementary risk faced by many banks and it's a major risk for many financial institutions and corporations as well. The main sources of credit risk are loans, although credit risk exists throughout the other activities of the bank both on and off the balance sheet. These other activities include acceptances, inter-bank transactions, trade financing, foreign exchange transactions, futures, swaps, options and guarantees. Given the significant size of the loan portfolio in balance sheets of local banks, credit risk remains the largest risk type in the local banking sector (CBK 2005).

In a study done by Nishimura (2001), he pointed out that non-performing loans should be treated as undesirable outputs or costs to a loaning bank, which decrease the bank's performance. This had been raised earlier by Brownbridge (1998) whose in his study noted that most of the bank

failures were caused by non-performing loans. Arrears affecting more than half the loan portfolios were typical of the failed banks. Many of the bad debts were attributable to moral hazard the adverse incentives on bank owners to adopt imprudent lending strategies, in particular insider lending and lending at high interest rates to borrowers in the most risky segments of the credit markets. The single biggest contributor to the bad loans of many of the failed local banks was insider lending Brownbridge (1998).

Customer failure to disclose vital information during the loan application process is one of the major factor as well as lack of an aggressive debt collection policy was perceived as the main bank specific factor contributing to the non performing debt problem in Kenya (Kalani et al 2009). Many Financial institutions that collapsed in Kenya since 1986 failed due to non performing loans. According to CBK (2003), there was a 4.5 per cent decline in pre-tax profit for the banking industry in the year 2002. The risk of non-performing loans mainly arose as the external economic environment became worse off such as a result of economic depression (Ngugi 2001). Due to the nature of their business, commercial banks expose themselves to the risks of default from borrowers. Prudent credit risk assessment and creation of adequate provisions for bad and doubtful debts can cushion the banks against credit risk. Muriuki (1998) in his study also noted that the issue of nonperforming loans was a major cause of bank failures in Kenya.

According to Wahome (2004), Daima Bank in Kenya was placed under statutory management for failing to meet the minimum core capitalization threshold as well as poor management of its loan portfolios. In at least half of the bank failures, insider loans accounted for a substantial proportion of the bad debts. Most of the larger local bank failures in Kenya, such as the Continental Bank, Trade Bank and Pan African Bank, involved extensive insider lending, often to politicians Wahome (2004).

Assessing commercial credit risk is a complicated task since many uncertain elements are involved in determining how likely it is that an event of default will happen and how costly default will turn out to be if it does occur. According to Crouhy et.al (2006), some of the newest approaches of credit risk assessment employ equity market data to track the likelihood of default

by public companies while other approaches have been developed to assess credit risk at the portfolio level using mathematical and statistical modeling. Other approaches of credit risk assessment are more traditional and based on credit risk assessments within an overall framework known as a credit rating system. To undertake credit assessment, analysts must take into consideration many complex attributes of a firm that in financial and managerial, quantitative and qualitative.

Credit risk assessment has progressed at a rapid pace since Basel I was adopted in 1988, although there is still a significant drop in the ability to quantify credit risk relative to market risk. At the transaction level, the use of credit rating models is now widespread for measuring expected loss, based on estimates of the probability of default (PD), loss given default (LGD), and exposure at default (EAD) of individual exposures. At the portfolio level, credit portfolio models such as KMV's Portfolio Manager calculate unexpected loss and economic capital, based on structural models of credit risk correlations (Carey et al 2001).

The research in credit risk assessment also suggests that credit risk is subject to more unknowns than market risk. Structural shifts in default risk, recovery levels, utilization rates, and credit correlations can all have a major impact on credit quantification. There are various ways of conducting credit risk assessment.

2.8.1.1 Credit Metrics and the Credit Migration Approach

This method was developed by JP Morgan, one of the leading US bank. It's based on the analysis of credit migration (Crouhy et.al 2006). This approach is underpinned by estimates of how likely it is that a borrower will move from one credit quality to another including default within a given time horizon. It allows banks to estimate the full one year forward distribution of the values of any bond or loan portfolio, where the changes in values are related to credit migration only. A key assumption to this approach however is that the past migration history of thousands of rated bonds accurately describes the probability of mitigation in the next period. The credit metrics risk measurement can be thought in two main building blocks. These are credit value at risk due to credit for a single financial instrument and the credit value at risk at the portfolio level which accounts for portfolio diversification effects.

These building blocks are implemented by means of a four step process. First is to specify the rating systems with rating grades, together with the probabilities of migrating from one credit to another over credit risk Horizon. The second is to specify a risk horizon usually taken to be one year. Third is to specify the forward discount curve at the risk horizon for each credit category. This will allow valuation of bonds using the zero curves corresponding to the potential future credit ratings of the issuer. In case of the default then the value of the instrument should be estimated in terms of the recovery rate, which is given a percentage of face value at par. The fourth and final step is that the information from the first three steps is combined to calculate the forward distribution of the changes in the portfolio value consequent on credit migration. The key problem with this method usually is the estimation of the ratings transition probabilities, or rating transition matrix using historical default data from either an external or internal rating system Crouhy et al (2006).

The Credit metrics model has its in challenges in implementation. Looking at the first step in assessing credit risk with credit metrics, it has to do it has to do with derivation of category thresholds. In doing so one needs to balance between number of categories and number of clients in each category. To clarify, any mis-estimation decreases if the number of rating categories increases due to the fact that if the number of rating categories tends to infinity, the deviation of the estimated value at risk from the true portfolio value at risk goes to zero. On the other hand, the assumption of homogeneous categories implies that sampling error from the estimation of default probabilities decreases with the number of clients per group. Hence, from this point of view, many clients per category are good.

Kealhofer et al (1998), Indicate that the estimation error can be considerably reduced if an investment and a speculative grade are distinguished. That is rather indication of exposure concentrations then definition by credit quality classification. Both grades are not so much defined by credit quality, but rather by exposure concentrations. Large exposures tend to have a strong impact on portfolio risk and thus intensify mis-estimations of default probabilities on the portfolio level.

Default probabilities and credit migration is also sensitive to correlation estimates among different credit categories. The degree of correlation between firms within the same category is irrelevant since default probability is drown from normal distribution mean and it is stylized fact of normal distribution that the mean is always an unbiased estimator independent of the degree of correlation among the firms in the same category. Correlation between different default categories is problematic and credit risk estimation is quite sensitive to those correlations. This is done in two ways notably estimation and stability. Correlation estimation is problematic in sense that it is not directly observable. Credit Metrics uses asset return as a proxy for correlation which in turn is surrogated by equity returns.

Crouhy et al (2006) indicates that the ratio of asset returns correlation to default probabilities correlation is approximately 10-1 which point toward the sensitivity of the supposition. Also, equity returns data availability and cleanness is not always guaranteed. Also, correlation among assets is varying with the economic cycle, especially for low credit quality firms indicating instability in correlation estimation. To this, they called for a structural model that estimate the variations in default probabilities based on fundamental variables with a stable correlations.

2.8.1.2 Structural Approach to Measuring Credit Risk using KMV Approach

Structural approach is based on an option pricing model first introduced in 1974 by Nobel Prize winner Robert Merton. The Merton model is based on the limited liability rule which allows shareholders to default on their obligations while surrendering firms' assets. During the 1990's, KMV used the Merton Model to develop a radically new approach to calculating default probabilities. KMV comes from the first letters of the last names of Stephen Kealhofer, John McQuown and Oldrich Vasicek the academics who founded the KMV Corporation in 1989. It differs from Credit metrics in that it derives an objective that is expected default frequency (EDF) for each issuer using equity market information rather than relying on judgmental credit ratings and the average historical transition frequencies produced by the rating agencies for each credit class. KMV has expanded its methodology from calculating EDFs for individual firms to measuring portfolio credit risk. EDF is a function of firm's capital structure, the current asset

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value and the volatility of the asset returns. The value of the firm's assets is inferred from the market value of equity, meaning that the KMV approach is best suited for banks trading at the stock markets, where the value of equity is determined by the stock market Crouhy et al (2006).

KMV model is also a sensitive model just like Credit Metrics. Being an extension of the Merton model, it inherits all of Merton's severe structural problems. These are; financial statements may present a flawed picture of a firm's true financial condition and future prospects. In addition, accounting principles are predominantly backward oriented and conservative in design. In addition, accounting information does not include a precise concept of future uncertainty. "Creative accounting" might even intend to disguise the firm's factual situation within certain legal limits. Finally, a market valuation of the firm's asset is difficult in the absence of actual market related information Fayyad (2008). He further states that KMV has so far refused to publish the precise methodology and the data upon which the empirical distributions are based on meaning that the model can be viewed as the proverbial black box which cannot be compensated because the relationship between distance to default and estimated probability of default is so sensitive that small errors in the measuring of the distance to default or in the mapping between both quantities can result to significant errors in the resulting default probability.

According to Keenan et.al (1999), KMV uses equity value as a proxy for asset volatility. Nevertheless, the stochastic process defining the equity value is heteroskedastic which means that equity volatility is not constant but changes over time thus prevents the model from being fully closed and add to uncertainty of the results. They show that default probabilities are overestimated if the fraction of equity volatility induced by asset volatility is overstated. This is also true for the expected return on firm value. Other than in the capital asset pricing model (CAPM), it cannot directly be calculated from market returns, but has to be calibrated from the firm spread for each maturity. This may leads to increasing imprecision of the results.

2.8.1.3 The Actuarial form Approaches and Reduced Form Approaches

The actuarial model and the reduced form models treat the firm's bankruptcy process, including recovery as factors external to the modeling process that is they make assumptions about bankruptcy process rather than attempting to derive it internally Crouhy (2006).

Credit risk+ released in the late 1997 by the investment bank Credit Suisse Financial Products (CSFP) is a purely actuarial model, based on the mortality models developed by insurance companies. The probabilities of default that the model apply are based on historical statistical data on default experience by credit class. Unlike KMV approach, there is no attempt to relate default to a firm's capital structure or balance sheet. Credit risk+ applies under two assumptions. The first is that for a loan, the probability of default in a given period, e.g. one month is the same as in any other periods of the same length like another month. The second assumption is that for a large number of obligors, the probability of default by any particular obligor is small, and the number of defaults that occur in any given period is independent of the number of defaults that occur in any other period.

According to Bratanovic et.al (2009), reduced form approach, has been developed using mechanism that drive credit spreads. These models treat spreads as if they were driven by only two factors. The likelihood of default and the expectations of market participants about recovery rates, reduced form models have become very important tools of in the credit markets and they currently form the foundation of pricing models for credit derivatives. The inputs for a reduced form model are; the term structure of default free interest rates, the term structure of credit spreads for each credit category and the loss rate for each credit category. There are also three assumptions made in the use of reduced form approach. The first is Zero correlations between credit events and interest rates, deterministic credit spreads for as long as there are no credit events and last assumptions s constant recovery rates.

Unlike structural model approaches, reduced form models don't attempt to predict default by looking at its underlying causes. They are essentially statistical and are based upon empirical market data. Its less intuitive compared to the structural model from an economic point of view, but they are derived using credit spreads that are observable in the world's financial markets and don't require any balance sheet information. The data used is largely credit instrument prices derived from markets such as corporate bonds, loans and credit derivatives markets as opposed to the equity price data from stock markets employed by the KMV approach Crouhy et.al (2006).

Conclusion on credit risk, an institution should have procedures for measuring its overall exposure to credit risk as well as exposure to connected groups, products, customers, market segments and industries for appropriate risk assessment. The measurement of risk should take into account the nature of the credit, maturity, and exposure profile, existence of collateral or guarantees and potential for default. The institution should also undertake an analysis of the whole economy or in particular sectors to ensure contingency plans are taken on higher than expected levels of delinquencies and defaults (CBK 2005).

2.8.2   Market Risk Assessment Techniques

According to CBK, market risk arises from the volatility of positions taken in four fundamental economic areas. These are interest sensitive debt securities, equities, currencies and commodities. These expose banks to price fluctuations in varies with on and off the balance sheet marketable financial securities. There are various types of market risk. These are Interest risk, equity positions risk and commodities risk (CBK 2008).

As pressure mounts on the banking industry's profitability resulting from over reliance on interest income by banks, it is strategically imperative that banks focus on other revenue streams. Banks that are applying prudential market risk management are already reaping benefits of the same. Cooperative Bank of Kenya announced a 70 per cent rise in its pre-tax profitability in year 2003 and declared its first dividend in six years. This was the second straight year of profitability for the bank, which had earlier reported a Sh2 billion loss in 2000. This was attributed to aggressive cost management; focus on non-funded income, debt recovery and prudent liquidity management contributed significantly to the bank's performance in the year (Wahome 2004).

 National Industrial Credit Bank of Kenya (NIC) introduced new products to diversify revenue and to keep its head above the water. Part of NIC bank's strategy has been to diversify revenues, by expanding the scope of its activities in addition to its predominant asset finance focus and offering more general commercial banking facilities and other products. Premium financing and provision of custodial services have reduced over reliance on interest income (Omuodo 2003).

2.8.2.1 Value at Risk (VaR)

The quantification of market risk has been a major issue for financial institutions as well as Central Banks over the past few years. Considerable technical efforts have been made to measure market risk as accurately as possible. It is the most readily quantifiable and granular of the major classes of bank risk. , Market risk models date back to the late 1980s, when Value at Risk (VaR) was first defined as a concept for measuring the risks of trading positions. By the mid-1990s, when the Market Risk Amendment to the Basel Accord was enacted, VaR models had become widely commercially available (Holton 2003). While there are differences in calculation approaches e.g., parametric VaR versus historical simulation – the underlying methodologies are highly standardized across the industry (Allen t al 2004 and Jorion 2000).

Andersen et al (2003) adds to this when they highlight that the early development of VaR mode reflects the rich data environment for market risk. Market risk factors are typically observed at high frequency, at least daily, and for the major currencies, interest rates, and equity indices, ultra-high frequency observations are available. In terms of granularity, market risk VaR can be determined at successive levels of aggregation, from the consolidated firm-wide trading book to individual trader positions, to the risk impact that is positive or negative of a marginal trade on the portfolio. Trading room systems technology allows individual traders to see the VaR impact of individual trades in real time. Not surprisingly, given the state of market risk measurement, the regulatory capital treatment for market risk is more advanced than for other risk types. It's the only risk under the existing Basel 1 accord for which firms are allowed to use their own internal VaR models with a regulatory- defined scalar to calculate the level of regulatory capital.

According to Lopez et al (2001) and Diebold et al (1998), since market risk is modeled daily and measurable at even higher frequencies, it is possible to back test market risk VaR calculations and conduct forecast evaluations against actual results in a statistically meaningful fashion. Abstracting from such structural changes, there are limits to the accuracy of market risk models. Marshall et al (1996) conducted a narrow experiment focusing on commercial VaR models. They supplied the same portfolio to eleven different vendors and found 95% one day ahead VaR estimates to vary across vendors between 1% for simple FX forwards up to 28% for more

complex interest rate options. Pritsker (1997) looked at variation in accuracy and computational time across six different VaR approaches for nonlinear and found a wide range in computational time and accuracy. Therefore, if such a broad range of outcomes is seen with relatively easy to measure market risk, that range is likely to be much wider for the other risk types.

In summary VaR Model modeling technique typically measures the banks aggregate market risk exposure at a given probability level. It estimates the amount a bank would lose if it were to hold a specific asset for a certain period of time. Inputs into VAR-model include data on the banks positions and on prices, volatility and risk factors. The risks covered by the model should include all the interest, currency, equity, commodity and option positions inherent in the bank's portfolio both on and off balance sheet positions (Pritsker 1997).

2.8.2.2   Back Testing

The aim of back testing is to test the effectiveness of market risk measurements by comparing the market risk figure with the volatility of the actual trading results. When performed at business line or trading desk levels, back testing is a useful tool to evaluate risk measurements methods (Diebold et al 1998). The process consists of comparing profits and loss figures with corresponding market risk figures over a period of time. Back testing at the portfolio level rather than for the whole bank allows individual market risks measurement models to be tested in practice. The lower the level at which back testing is applied, the more the information becomes available about the risks are being taken that are not detected by the risk measurement systems.

2.8.2.3   Static Gap Model

The aim of this model is to allocate assets and liabilities to maturity buckets defined according to their re-pricing characteristics and to measure the gap at each maturity point. In this model, the components of the balance sheet are separated into items that are sensitive to interest rates and those that are not. They are in turn sorted by re-pricing period or modified duration and allocated time periods known as maturity buckets (Marshall et al 1996).

The focus of this analysis is on re-pricing the point in which interest rates may be changed and not the concept of liquidity and cash flow. In terms of this to risk management, the gap is closed

when the re-pricing of rate sensitive assets and liabilities is adequately matched. This model can be improved through sensitivity analysis where the interest rates are varied and their impact on the balance sheet and profit and loss studied by simulation.

2.8.2.4   Stress Testing

According to Andersen et al (2003), the purpose of stress testing it to identify events or influences that may result in a loss that is those that may have negative impact on a bank's capital position. Stress testing should be qualitative & quantitative in nature. Quantitative criteria should identify plausible stress scenarios that could occur in a banks market environment. Qualitative criteria should focus on 2 key aspects of stress testing these evaluations of the banks capacity to absorb potentially large losses and identification of measures that a bank can take to reduce risks & preserve capital. These analyses include obtaining data on the largest actual losses experienced during a specific periods and comparing it to the level of losses by the banks internal risk measurement systems such as the VAR. It also included simulation of extreme stress scenarios that is testing of a current portfolio during periods of significant disturbances.

2.8.3   Operational risk Assessment Techniques

Operational risk is associated with human error, system failures and inadequate procedures and controls. It is the risk of loss arising from the potential that inadequate information system; technology failures, breaches in internal controls, fraud, unforeseen catastrophes, or other operational problems may result in unexpected losses. Operational risk exists in all products and business activities (CBK 2005).

Changes in markets, techniques, technologies, and products have altered the landscape of Operations and fueled the explosive development of Operational Risk management. The regulators of financial and public companies are demanding a far greater level of disclosure and awareness by directors about the risks they manage and the effectiveness of the controls they have in place to reduce or mitigate these risks. There is also a greater realization that a major source of earnings volatility can be attributed to the way a firm operates and not "financial risk". All these

changes have triggered the need for an efficient Operational Risk Management system in organizations (De Fontnouvelle 2006).

Yussuf (2005) in his study on operational risks management practices by the commercial banks in Kenya found that every big bank in Kenya had an operational risk department. Of these the most common of operational risk was the one caused by failure of the employees within the bank and conflict of interest from other fraudulent behaviors. A research also conducted by Obiero (2002) found that bank failures in Kenya were mainly caused by dishonest Managers. Such situations led to the embezzlement of funds. Directors were to blame for formulating in   appropriate policy guidelines to guide senior management in running the banking institutions.

Operational risk is the newest risk class to emerge as a discrete category. Prior to the early consultative papers for Basel II, there was no agreement on what the definition of operational risk was, let alone how to measure it. Basel II established a standardized definition and classification scheme for operational risk. It provided a framework outlining three methods for calculating operational risk capital charges in a continuum of increasing sophistication and risk sensitivity. These are The Basic Indicator Approach, the standardized approach and the Advanced Measurement approach (BASEL 2005). A bank will be permitted to use the Basic Indicator or Standardized Approach for some parts of its operations and an advanced approach for others provided it meets certain minimum criteria. It's important to note that a bank will not be allowed to choose to revert to a simpler approach once it has been approved for a more advanced approach without supervisory approval (Basel 2004).

Prior to the Basel II pronouncements, operational risk was often included together with other non-financial risks as "operating risk," and measured in economic capital frameworks if at all, through analogs and benchmarks such as revenue and expense ratios (Uyemura et al 1992, Netter et al 2003). Basel II has catalyzed a major industry effort to model and measure operational risks. The challenge in operational risk measurement, however, is that operational losses appear to be extremely fat-tailed. The losses that are most relevant for measuring economic capital are, by definition, low frequency, high severity events that are difficult to observe within any one firm. For this reason, Basel II requires that banks incorporate information from external data and

extreme loss scenarios in their operational loss models (De Fontnouvelle et al 2006, Rosenberg et al 2006). For this reason, Basel II requires that banks incorporate information from external data and extreme loss scenarios in their operational loss models.

Despite the recent progress in operational risk assessment, it is fair to say that operational risk measurement is still at relatively early stages of development. A standard approach for quantifying operational risk has yet to emerge and small changes in parameter estimation can have a dramatic impact on results at the 99.9% level (Allen et al 2004). De Fontnouvelle et al (2006) applied EVT techniques to estimate the operational risk loss distributions for six banks, based on internally reported data. The results were not very precise. In an analysis of De Fontnouvelle (2006), he showed that differences in the shape parameter of the generalized Pareto distributions estimated for the six banks were consistent with a ten to one range in resulting economic capital. Equally, because of the focus on extreme tail events, operational risks were difficult to break down to lower levels of aggregation. The risks that can be observed within individual business units tend to be high-frequency; low severity risks and not the low frequency, high severity risks that are relevant for economic capital.

The measures of Operational Risk as highlighted by Basel II are;

2.8.3.1 The Basic Indicator Approach
Banks using the Basic Indicator Approach must hold capital for operational risk equal to the average over the previous three years of a fixed percentage (denoted alpha) of positive annual gross income. Figures for any year in which annual gross income is negative or zero should be excluded from both the numerator and denominator when calculating the average the charge may be expressed as follows:

$K_{BIA} = [\sum (GI_{1...n} \, \textbf{\textit{x}} \, \textbf{\textit{ß}})]/n$

Where: KBIA = the capital charge under the Basic Indicator Approach.

GI = annual gross income, where positive, over the previous three years.

N = number of the previous three years for which gross income is positive.

ß = 15%, which is set by the Committee, relating the industry wide level of required capital to the industry wide level of the indicator.

2.8.3.2 The Standardized Approach

In the Standardized Approach, banks' activities are divided into eight business lines. These are corporate finance, trading and sales, retail banking, commercial banking, payment and settlement, agency services, asset management, and retail brokerage.

Within each business line, gross income is a broad indicator that serves as a proxy for the scale of business operations and thus the likely scale of operational risk exposure within each of these business lines. The capital charge for each business line is calculated by multiplying gross income by a factor (denoted beta) assigned to that business line. Beta serves as a proxy for the industry-wide relationship between the operational risk loss experience for a given business line and the aggregate level of gross income for that business line. It should be noted that in the Standardized Approach gross income is measured for each business line, not the whole institution, i.e. in corporate finance, the indicator is the gross income generated in the corporate finance business line.

The total capital charge is calculated as the three-year average of the simple summation of the regulatory capital charges across each of the business lines in each year. In any given year, negative capital charges (resulting from negative gross income) in any business line may offset positive capital charges in other business lines without limit. However, where the aggregate capital charge across all business lines within a given year is negative, then the input to the numerator for that year will be zero. The total capital charge may be expressed as:

$$K_{TSA} = \{\sum_{YEARS\ 1\text{-}3} MAX\ [\sum GI_{1...8}\ x\ \beta_{1\text{-}8}),\ 0]\}/^3$$

Where: KTSA = the capital charge under the Standardized Approach.

GI1-8 = annual gross income in a given year, as defined above in the Basic Indicator Approach, for each of the eight business lines.

β 1-8 = a fixed percentage, set by the committee, relating the level of required capital to the level of the gross income for each of the eight business lines.

The values of the betas are detailed below.

Figure 2.5.3.2: Beta Factor Table Standardized Approach in Operational Risk Assessment

Business Lines	Beta Factors (ß)
Corporate finance	18%
Trading and sales	18%
Retail banking	12%
Commercial banking	15%
Payment and settlement	18%
Agency services	15%
Asset management	12%
Retail brokerage	12%

2.8.3.3   Advanced Measurement Approaches (AMA)

Under the AMA, the regulatory capital requirement will equal the risk measure generated by the bank's internal operational risk measurement system using the quantitative and qualitative criteria for the AMA discussed below. Use of the AMA is subject to supervisory approval (BASEL 2005).

Supervisory approval would be conditional on the bank demonstrating to the satisfaction of the relevant supervisors that the allocation mechanism for these subsidiaries is appropriate and can be supported empirically. The board of directors and senior management of each subsidiary are responsible for conducting their own assessment of the subsidiary's operational risks and controls and ensuring the subsidiary is adequately capitalized in respect of those risks

2.8.4   Strategic / Business Risk Assessment

Strategic risk is the current and prospective impact on earnings or capital arising from adverse business decisions, improper implementation of decisions, or lack of responsiveness to industry changes. This risk is a function of the compatibility of an organization's strategic goals, the

business strategies developed to achieve those goals, the resources deployed against these goals, and the quality of implementation (CBK 2005).

According to Slywotzky et al (2005), business risk is easiest to observe at the bank wide level. Of all the risk types, it is the one we are the least able to break down to lower levels of aggregation. This is not to say that business risk is not "managed" but simply that it is hard to manage in a granular fashion.

In order to ensure an effective strategic risk management assessment, every institution should deploy an integrated management information system that enables monitoring of current and forecasted economic conditions, industry and market conditions, e.g. increasing competition by new market entrants, number and size of mergers and acquisitions changing customer behavior, new products/substitutes, exposure to different sectors, and associated sector risks (CBK 2005).

2.8.5   Liquidity Risk Assessment Techniques

Liquidity Risk is the current or prospective risk to earnings and capital arising from a bank's inability to meet its liabilities when they fall due without incurring unacceptable losses. Liquidity risk may not be seen in isolation, because it is often triggered by consequences of other financial risk such as credit risk, market risk etc. and similarly, liquidity problems may have significant implications on the whole financial system (CBK 2005). This point was reinforced by Diamond et al (1993) who defined Banking liquidity risk as that associated both to banks' ability to fulfill their obligation to depositors to transform their deposits into legal money, and their function of maintaining a balance between the ingoing and outgoing cash flows deriving from the management of payments made using banking money.

It is good to note that liquidity risk assessment involves not only analyzing banks on and off balance sheet positions to forecast future cash flows but also how the funding requirements could be met. Analysis of the liquidity profile of Diamond Bank of Kenya (DBK), Kenya Commercial Bank (KCB) and several other banks indicated that by them holding substantial share of government securities largely helped them mitigate liquidity risk (Kalani et al 2009). In an earlier study done by Wahome et al (2004), he noted that banks should identify the funding markets

which they can have access to , understand the nature of those markets and then evaluate the bank's current and future use of the market and monitoring signs of confidence erosion.

According to the CBK (2005), Liquidity risk is the potential for loss to an institution arising from either its inability to meet its obligations or to fund increases in assets as they fall due without incurring unacceptable cost or losses. Liquidity is the ability of an institution to generate sufficient cash or its equivalent in a timely manner at a reasonable price to meet its commitments as they fall due.

In a survey conducted by the Basel Committee on Banking Supervision (2008) on the state of liquidity regimes reports that, in spite of common general liquidity supervision objectives, there are differences in the national approaches due to different mixes of quantitative and qualitative rules. The committee highlighted that in some countries, the authorities' emphasis is more on traditional quantitative approaches, with the definition of specific rules and the setting of liquidity buffers that banks are required to hold. Banks are obliged to maintain specific minimum liquidity parameters, and to meet targets such as limits on maturity mismatches or reliance on a particular funding source, liquidity ratios, cash capital positions and long-term funding ratios.

Nevertheless, Panetta et al (2008) and Tarantola (2008) highlighted that the increasing awareness that inflexible quantitative rules could be ineffective in a financial situation due to stress which has recently led some supervisory authorities to turn to qualitative approaches, based on reviewing and strengthening banks' internal risk management systems. Under this approach, banks are required to develop and document internal systems for the management, control, monitoring and reporting of liquidity positions, identifying specific measurements of liquidity risks, to be periodically validated by supervisors. Increasing importance is also being given to stress tests and contingency funding plans to deal with stress scenarios, with indication of management responsibilities, procedures and the potential sources of liquidity being adopted. According to Rosenberg (2006), with specific regard to liquidity risk, it emerges that stress tests carried out before the crisis failed to identify potential weaknesses and vulnerability in banks' liquidity positions.

Basel Committee on Banking Supervision, (2008a) explained that the main problem was that these tests omitted critical linkages, such as those between credit risk, market risk and liquidity risk. Similarly, more emphasis has been placed on liquidity risk, reflecting the recent shortcomings on the part of rating agencies in accounting for this factor in recent well publicized defaults. New products have been developed which aim to assess the availability of short-term financing for companies and take into account the increasing volatility of financing conditions, especially for speculative grade issuers: Liquidity risk assessments (LRAs) for issuers of US commercial paper were introduced in March 2002, the speculative grade liquidity rating (SGLs) for speculative grade issuers followed in September 2002.30 SGLs are opinions about an issuer's ability to generate cash from internal sources and the availability of external sources of committed finance relative to its cash obligations over the coming 12 months. More specifically, liquidity ratings are defined as a measure of the impact that a loss of access to liquidity would have on an issuer; and the short-term rating is defined as a product of that impact and the probability of occurrence of a loss of access (De Fontnouvelle et al 2006).

In Kenya, CBK has given an approach which should be used by the financial institutions to assess the level of liquidity risk. It has reinforced that an effective measurement and monitoring system is essential for adequate management of liquidity risk. Key elements of an effective risk management process include an efficient Management Information System (MIS), systems to measure, monitor and control risks.

2.8.6 Regulatory Risk Assessment

Regulatory risk is the risk of non-compliance with regulatory guidelines. Regulatory risk is the current and prospective risk to earnings or capital arising from violations of, or non-conformance with, laws, rules, regulations, prescribed practice, or ethical standards issued by the regulator from time to time. Regulatory risk also arises in situations where the laws or rules governing certain bank products or activities of the bank's clients may be ambiguous or untested (CBK 2005).

Charter House bank of Kenya was closed after a parliamentarian notified the legislature of its failure to follow the laid regulations by CB by lending to one customer in excess of 25% of the bank's core capital and failure to keep proper documentations of the opened accounts (Cheserek

2007). In an earlier study conducted by Obiero (2002), it had also indicated that a total number of 6 banks had in the past been closed due to failure to meet the set regulations.

2.8.7 Reputational Risk Assessment

According to CBK (2005), reputational risk is the potential that negative publicity regarding an institution's business practices, whether true or not, will cause a decline in the customer base, costly litigation, or revenue reductions. This risk may result from a financial institution's failure to effectively manage any or all of the other risk types. Reputational risk also involves external perception too. Thus, where the actions of a business damage its reputation, to the extent that it may lose sales or customers, or to the extent that they lose business or offer to bear or share losses suffered by their customers are regarded s reputational risk.

Lack of proper reputational assessment may lead to decreased customer base as well as costly litigations against the bank as well as revenue reduction. A research conducted by Obiero (2002) indicates that 4 banks in Kenya have so far failed due to failure to properly manage reputational Risk.

2.9   Empirical Studies on Dangers of Bank Risk

Bank risk if not adequately addressed can result to various repercussion within the banking institution. This can result to instability within the banking systems. Some of these consequences that can be brought about by the banking risk are:

2.9.1   Bank Runs

Bank run is one of the consequences faced by banks as a result of it being exposed to high risk levels. Bank runs have been a subject of much research interest and theoretical as well as empirical studies dedicated to bank runs continue to proliferate especially during periods of high financial vulnerability. Bank runs refers to a situation in which most of the depositor of a bank attempt to withdraw their funds from the bank (Chen et al 2006). Economists have debated the positive as well as negative consequences of bank runs of which has produced effective and ineffective bank runs. According to Saunders et al (1996), an effective bank run is the one that is based on some negative information about the bank increased riskiness. It occurs when the bank

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risk becomes un-acceptable to the depositor that is it's based on the deterioration of bank fundamentals.

Bank runs often leads to re-distribution of funds from riskier to more reliable institutions. This is how market mechanisms work as stipulated by the second pillar of Basel II. From the social welfare perspective, effective bank runs help in minimizing the costs of bank bankruptcy thus reducing the time needed to resolve the banks creditworthiness problems (Alonso 1996). On the other hand, ineffective bank runs are triggered by events and information that are not related to the deterioration of bank fundamentals of which the reasons for these may be completely different including information that is not related to the bank, the behavior of other depositors etc (Saunders et al 1996).

According to Diamond (1993) model and other information based bank run models, they all include costly information signals for depositors. The cost inclusion indicates that depositors must decide whether to pay for information related to bank riskiness. The costs may involve time and other resources needed to find and read financial information.

2.9.2   Banking Panic

Banking panic can be defined as a situation created when depositors' expectations of the bank's fundamentals do not change. They are triggered by changes in depositors' expectations of the bank-specific information process. More specifically, depositors may start a run when they expect that more noisy information about banks will be revealed, or when they expect that precise information about banks will not be revealed. its however good to note that a Banking panic doesn't always constitute a bank run but rather an environment which created making the investors want to withdraw their deposits from the bank. Bank runs are often a consequence of panic (Chen et al 2006).

Consider a bank that collects deposits to invest in risky assets. Depositors may demand liquidity and the bank provides it by allowing early withdrawing depositors to consume more than the liquidation values of their deposits. Once the information gets to the depositors as to what is happening may cause panic which can lead to massive bank runs (Saunders et al 1996). This explains why panic runs occur which seem similar to bank runs. At any point in time after they

deposit, depositors can decide whether to withdraw immediately or to wait, and a bank run will occur when the depositors' expected payoff for waiting is lower than what they can receive from successfully withdrawals.

When depositors learn that a relatively noisy but still informative signal will be revealed, they realize that a welfare decreasing bank run is more likely to occur, so their payoff for waiting becomes lower. Similarly, when depositors learn that a precise signal will not be revealed, they realize that they will not be able to use the signal for triggering a welfare improving bank run, so their payoff for waiting also becomes lower. In both cases, the reduction in depositors' expected payoff for waiting may lead to a panic run (Chen et al 2006).

2.9.3   Bank Bankruptcy

An institution is deemed bankrupt if it's unable to pay its liabilities as and when they fall due. It is the condition of a legal entity that does not have the financial means to pay their incurred debts as they fall due. In the U.S. this status is established through legal procedures involving a petition by the bankrupt or by its creditors (Wikipedia dictionary).

The empirical study of Bankruptcy within the banking sector gained momentum upon the realization that the problem of asymmetric information within banks and firms lies at the heart of an important market failure such as credit rationing and that the improvement of the same would reduce the borrowers moral hazard (Calomiris et al 1997). Contagion effect is one of the causes of bankruptcy within the commercial banks. Even though contagious defaults are rare, they can wipe out a major part of the banking system. Contagion is a low probability high impact event. On the other hand, bankruptcy costs play a decisive role in the intensity of domino effects. An efficient bankruptcy procedure is therefore crucial in safeguarding financial stability of any financial institution. Central bank can also come in as a lender of last resort to help an institution during bankruptcy.

2.9.4   Bank failure

Banking risk can result to bank failure. A study done by Kaufmann (1996) revealed that bank failure is a consequence of other repercussion suffered as a result of banking risk. These were mostly as a result of bank runs and the contagion effect. A bank fails economically when the

market value of its assets declines below the market value of its capital. At this time the bank cannot be able to pay its depositors in full and on time (Benston et al 1996).

Regulators traditionally rely on accounting statements to monitor the financial health of banks. Accounting data, however, are not issued frequently and they have a significant time lag. Moreover, there may be an incentive for a failing bank to disguise its true state from regulators and the financial markets. For example, the external auditors of the two bank failures in recent Canadian history, Canadian Commercial Bank and the Northland Bank, were persuaded by management to accept accounting statements about which they had serious concerns (Benston et al 1996). This is less likely to occur today, because regulation and supervision in the financial service sector have improved. Nevertheless, accounting data are still prone to manipulation by the reporting institution and valuable information can be lost.

In Kenya, Bank failures has culminated into huge losses in non monetary costs which accompany bank failures and the re-structuring of banks in terms of business folding ups. There have been calls for more reproductive approach to forestalling bank failures. According to the market intelligence 2000 banking survey, the CBK besides regulating the banking sector is charged with the responsibility of supervising banks and raising the red flag at the first sight of danger of which it has the responsibility of appointing a receiver manager for foresee the banks return to operational and financial health (Kibera 2007). In a different study, Obiero (2002) highlighted the effects of bank failure as causing   unemployment and general instability in the financial sector. Financial systems have not been fully quantified but leading to crises that have far reaching effects to the general economic growth in the country.

2.9.5   Contagion effect

Contagion effect is defined as the risk of an initial bank failure spilling over to the rest of the banking sector thus causing more bank failures (Grossman 1993). It is where one bank failure tends to have a domino effect throughout the banking system. The same definition was given by Kaufmann (1994). According to an empirical study conducted by Kaufmann (1994), an initial failure could generate further failures without the intervention by the authorities. This seems to support the view that lender of last resort from Central Bank to individual banks maybe justified

in some cases so as to prevent the potential spillovers effects of bank failures. If there is a role of public intervention to save the bank from collapsing, then it can be argued that there should be regulations and supervision for these banking institutions so as to prevent the adverse effects and moral hazard of such interventions (Goodhart et al 1995).

In his empirical study of contagion effect, Kaufmann (1994) first examined how broad contagion can spread within the banking sector. A number of studies have measured the breadth of the spillover from a bank failure by the loss of shareholders of surviving banks as evidenced in the returns. Using the stock market data, these studies examined the post announcement share performance. Negative abnormal returns were viewed as an indicator for contagion effects. Kaufmann found only little evidence of these empirical studies. An initial failure didn't cause direct further failures. However, information about the first few banks which had difficulties revealed information about some other banks.

2.9.6   Summary

It is worth noting that despite the controls measures put in by the Central Bank of Kenya in order to streamline commercial banks operations in Kenya by introducing statutory regulatory measures of containment, more banks in 1983 to be precise 32 banks were put under receivership in the period following the introduction of the control mechanisms. Most of them went under due to poor management and in ability to put in place efficient risk assessment procedures.

In the year 1986, Continental Bank of Kenya ltd and continental credit finance collapsed. These were followed closely by Capital Finance Limited in 1987. In the year 1989, seven more banks collapsed. However, they were merged during the same year to form the Consolidated Bank of Kenya. A total of thirteen banks collapsed in 1993, five banks collapsed in the period between 1996 to 1999.During the year 1999, Trust bank which was the sixth largest bank in Kenya in terms of customer deposits collapsed. Most recently, in the year 2003, Euro bank and Daima bank collapsed. In 2005, Charter House bank was put under statutory management (Cheserek 2007).

Yussuf (2005) in his study on operational risks management practices by the commercial banks found that every big bank in Kenya had an operational risk department. Of these the most

common of operational risk was the one caused by failure of the employees within the bank and conflict of interest from other fraudulent behaviors.

It can therefore be concluded that as laid out by Basel II and the CBK, no matter the regulatory framework laid out by the supervisory institutions, it is up to the individual banks to set up elaborate risk assessment procedures so as to mitigate themselves against risks which are likely to curtail their operations.

CHAPTER THREE

3.0   RESEARCH METHODOLOGY

3.1   Introduction

This chapter describes the population of the study, the basis of sampling, the data collection instruments as well as the data analysis techniques used so as to achieve the objective of this study. The aim of the study was to analyze the risk assessment techniques currently being applied by the commercial banks in Kenya. This was done with due regard to different risk types which the banking institution is exposed to.

3.2   Research Design

The research design for this study is that of a census survey. Full reporting or census survey has long been recognized as the traditional method for central banks to collect economic and financial data, in particular from commercial banks. This method is widely used in areas where central banks have legal authority to demand full reporting in monetary and banking statistics as well as in exchange controls (IFC Bulletin 2009). An important characteristic of the census method is that it can collect data with full coverage so that the information from niche areas as well as major components is fully captured. This design enabled data collection on techniques under application by the commercial banks on risk assessment. The study provides further insight of the research problem. The design was selected since there is no any documented study found relating to evaluation of risk assessment techniques applied by the commercial banks in Kenya.

3.3   Population of the Study

The data for this research was to be collected from all the 44 commercial banks which were operational as at 31st Dec 2008 according to the data available from the CBK (Appendix1). However, only 42 Banks responded to the study which is 95.45% of the total population.

3.4   Data Collection

The main source of data for the study was the primary data collected through the use of a questionnaire containing both structured and unstructured questions. It took into account the significant activities the financial institutions engage into as well as the risks that they are exposed to. The questionnaire was self administered through drop and pick later method. Follow up was

done via personal visits and telephone conversations. Email was also used in facilitating faster response. The questionnaire had three sections; Section I was to provide the demographic data of the staff in the risk control department, Section II covers the various techniques and approaches used in risk assessment whereas section III was for assessing the frequency at which the risk assessment is carried out and the awareness level of the risk measurement methods applied in the organization. These three parts ensured a comprehensive coverage of this study.

3.5   Data Analysis

Data obtained was be analyzed through the use factor analysis which is a statistical technique used to classify large numbers of interrelated variables into a limited number of factors. It's an efficient method of reorganizing the items the researcher is investigating into conceptual and precise variable groups. This was enabled through the use SPSS version 16. Factor analysis attempts to identify underlying variables, or factors, that explain the pattern of correlations within a set of observed variables. It is often used in data reduction to identify a small number of factors that explain most of the variance observed in a much larger number of manifest variables as well as generate hypotheses regarding causal mechanisms or to screen variables for subsequent analysis for example, to identify co linearity prior to performing a linear regression analysis. Data is presented using frequency tables, graphs tables and charts.

3.6   Data Reliability and Validity

Confidentiality assurance had been given and an assurance that the data obtained will be used for academic work only. To ensure validity of the data collected and its reliability, each bank was given at least two questionnaires which were only distributed to staff in the risk control departments. The data was then be subjected to variability test. Z-test was used to test the variability of the data obtained at 95% confidence level.

4.0   DATA ANALYSIS AND RESULTS

4.1   Introduction

This research was aimed at undertaking an investigation on risk assessment techniques applied by commercial banks in Kenya as well as assess their risk exposure level. This was achieved through a well drafted questionnaire guided by the study objectives.

It was a census survey which targeted all the commercial banks in Kenya as per the data given in appendix 1. Each of the 44 banks was given two questionnaires. Two of the banks namely Middle East Bank Kenya Ltd and Charter House Bank declined to give their feedback but 42 of them did representing 95.5% of the total target population.

4.2   Demographic data

The first part of the questionnaires was to get some demographic data related to the bank staff working in the risk control department, the one who participated by responding to my questionnaires. The findings we as given by the table in figure 4.1 below;

Figure 4.2.1: Demographic Data of Staff in Banks Risk Control Department

Section I: Demographic Data							
What title do you hold in the bank?	**%**		**What is your Gender?**	**%**		**What is your age bracket?**	**%**
Risk evaluation Officer	41%		Male	70%		below 30 yrs	20%
Credit control officer	56%		Female	30%		31 – 40 yrs	71%
Bank manager	3%					over 40 yrs	10%

41% of the respondents were risk evaluation officers, 56% credit control officers and 3% were Bank managers. 70% of these respondents were of male gender whereas 30% were of female gender. According to the findings, 71% of these respondents were within the age bracket of 31-40years. Only 20% were below this age and 10 % below.

4.3   Credit risk assessment techniques results

Credit risk was the first of risks to undertake an investigation as to the techniques used in its assessment. After undertaking a review the loan portfolio structure of the loans lent by commercial banks in Kenya. The findings were as given in figure 4.3.1 below

Figure 4.3.1: Loans Lending by Commercial Banks in Kenya
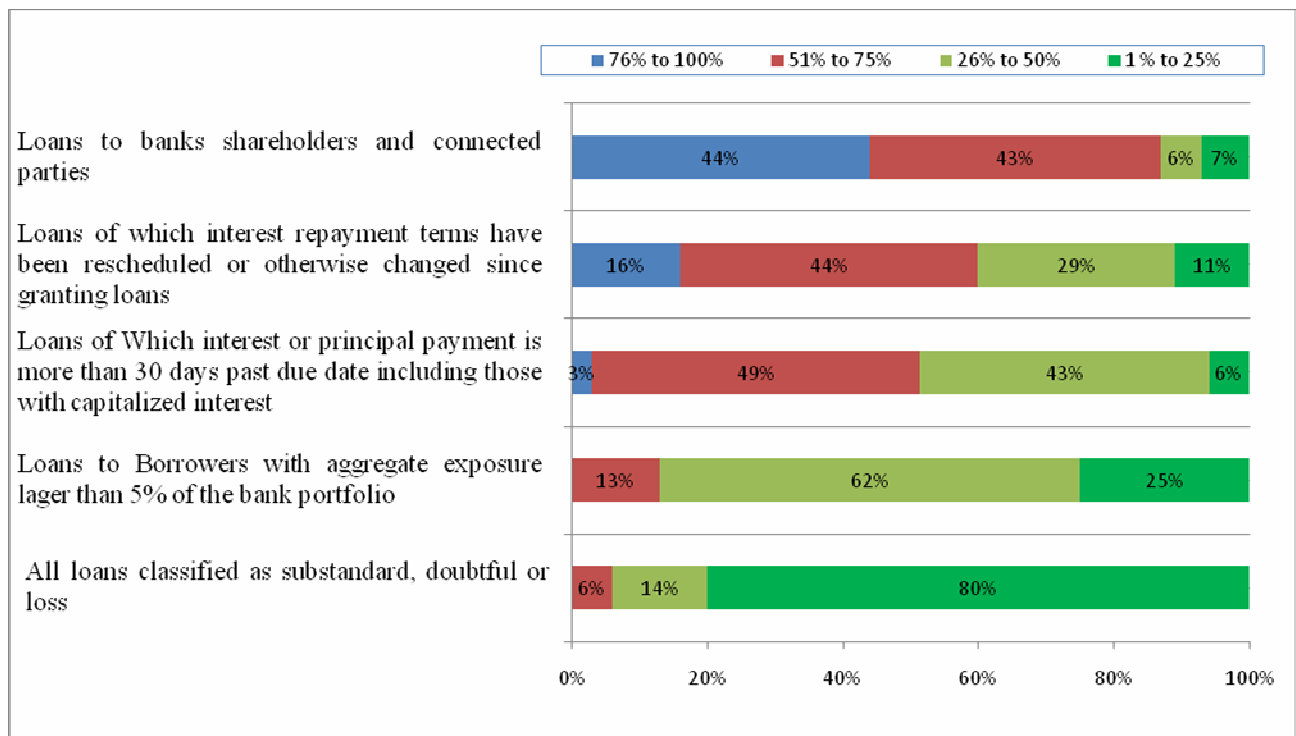
 The findings were; loans to banks shareholders and connected parties, of 44% of the banks rated this to be between 76-10% of their loan portfolio, 43% of the banks rate the loans at between 51-75% whereas 6% of the banks rate it at between 26-50%. Only 7 % of the banks rate this loan to be between 1-25%.

For the Loans of which interest repayment terms have been rescheduled or otherwise changed since the time the loan was granted, 16% of the banks rated the loan as between 76%-100% whereas 44 % of the banks rated these loans to be between 51% to 75% of the total. 29% of the banks rated this loan to be between 26-50% whereas 11% of the banks rated the loans to be between 1-25%. The other category were loans of which interest of principal payment was more

than 30 days past due date including those with capitalized interests. Of the banks under the study, 3% rated this loan to be 76-100% of their loan portfolio, 49% of the banks to be between 51-7%, 43% of the banks rated this loan as between 26-50% whereas only 6% of the banks rated these loans to be between 1-25%.

For the loans to borrowers with aggregate exposure larger than 5% of the loan portfolio, 13% of the banks rated the loans to be between 76-100%, a huge 62% of the banks rated these loans to be between 51-75%. 25 % of the banks rated this loan to be between 25-50%. There were no banks whose rates on these loan portfolio was said to be between 1-25%. Of all the above loans, the loans considered as substandard, doubtful or loss, 6% of the banks rated the loans to be between 76-100%, 14% of the banks to be between 51 to 75% whereas 80% of the banks rated this t between 25-50%.

The other issue was how often the bank offer credit to related parties. The results were as given in figure 4.3.2 below

**Figure 4.3.2 Banks lending to related parties**
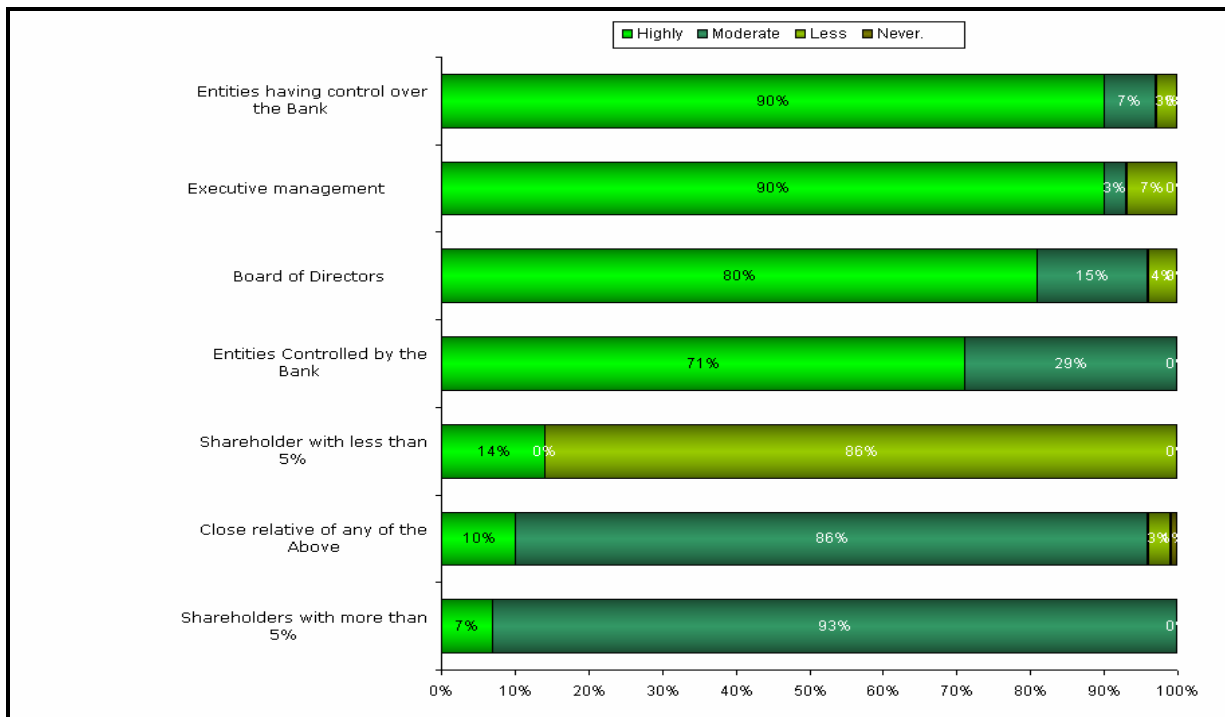
Of these there are those entities having control over the bank. 90% of the banks involved in the study responded that it's highly likely to lend t them, 7% as moderate and 3% as less likely. No bank disqualified giving of loans to this category. This same trend was observed with relation of lending to the executive management and board of directors. 90% and 80% of the banks under the study reported lending as highly to these groups respectively. 71% lend highly to entities controlled by the bank. 3% of the banks make moderate lending to the executive management while 15 % to the Board of Directors. As for the entities controlled by the banks, moderate lending was at 29%. Less lending to the executive management was reported by 7% of the banks and 4 % to the Board of directors.

Lending to the shareholders with less than 5% of the bank ownership, 14% of the banks under the study reported high lending to this group whereas 86% reported no lending at all to them. Other groups include lending to close relatives and shareholders with more than 5% of the bank ownership. 10% reported high lending to close relative of the categories discussed above and a whopping 86% of the banks reported moderate lending to this group. 3% reported less lending whereas 1% of the banks no lending at all. A for the share holders with more than 5% of the bank ownership, 7% of the banks reported high lending whereas 93% reported moderate lending with no bank reporting low lending or non lending.

So what checks and criteria has the banks put in place to reduce credit risk while granting of loans.

The results were as given in figure 4.3.3 below

Figure 4.3.3: Criteria for Risk Reduction in Lending Loans
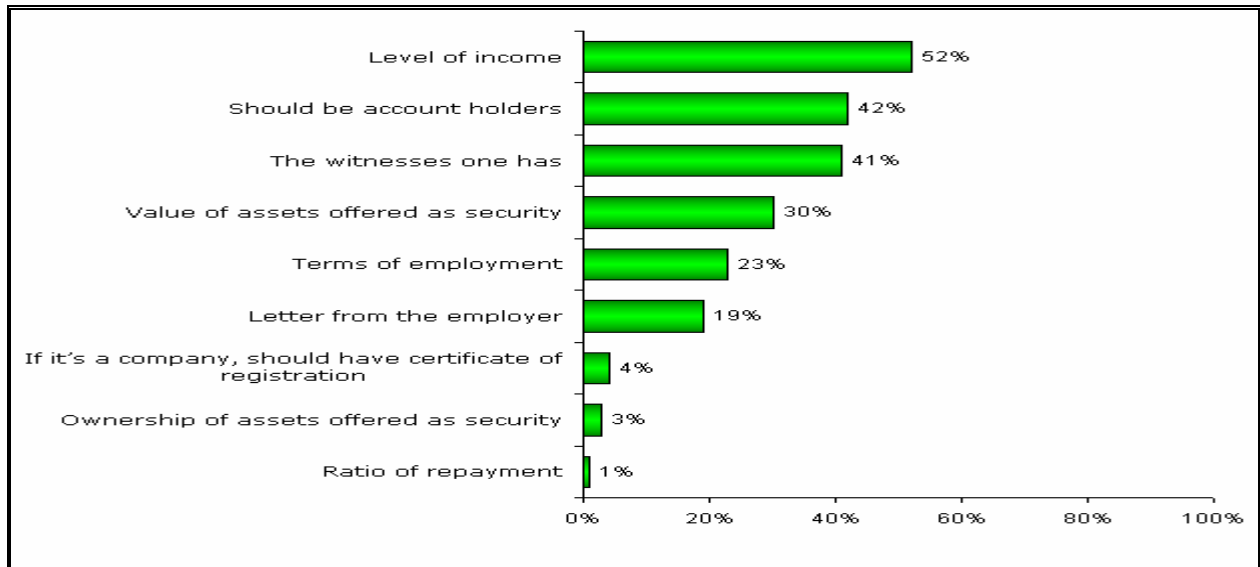
52% of the banks lay emphasis on the income levels of the borrowers be it individuals or firms. 42% reported that these borrowers should be account holders with the bank. There is also need for a witness in before lending according to 41% of the banks. The value for collateral meaning there is need for security reported by 30% of the banks. As for the individual lending, 23% of the banks will require to know the terms of employment, 19% requesting to the employers letter. For lending to companies, 4% of the banks would require a certificate of registration from the company and 3% want more information related to ownership of the assets offered as security for the loan. The repayment ratio to apply played the least role on this at 1%.

With regards to whether the banks has developed a methodology for identifying and measuring credit risk for its internal needs and how it works. The results were not very different from those given in figure 4.3.3, 42% of the banks reported they use value of the security, 20 % assess by use of borrowers income level whereas 10% reported that they use well trained credit officers. 7% asses the ready market of the given security whereas 4% dig into the borrowers past history of how they repaid an earlier loan. 3% of the banks insist that the loan witnesses should be account holders with bank. 1% requires the borrowers to have the business registration certificate to certify its existence. On assessing whether the banks have any formalized credit policies and underwriting criteria that enables them identify their target markets, 56% of the banks reported

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the use the business certificate as a registration proof of the business. For individuals 36% of the banks target the people who have permanent employment. For the witnesses to the loan transactions 15% of banks insist that these people have to be account holders with the bank. 14%of the banks also recorded targeting registered groups as well as those who have constant monthly income available.

If the loans lent turns to be problematic loans, 57% of the banks recover them from the securities offered. 30% of the banks hold witnesses responsible while 13% deduct these loans from the salaries. This is as indicated in figure 4.3.4 below

Figure 4.3.4: Methods of Dealing with Problematic Loans
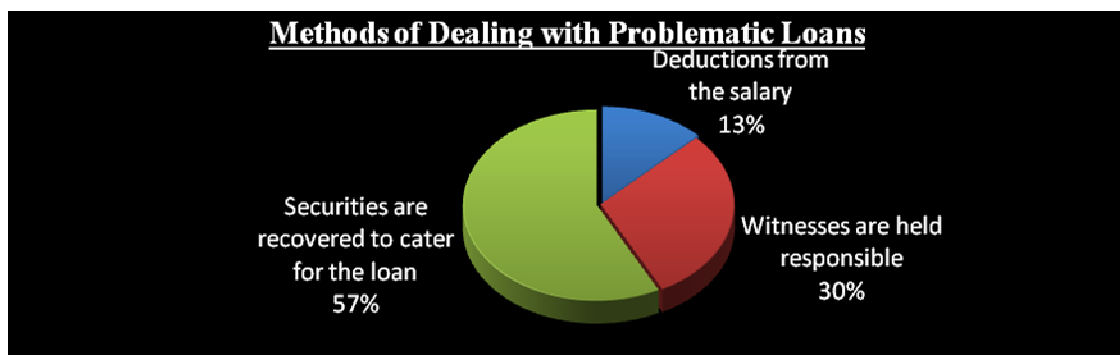
So what mechanisms other mechanisms to the banks have for legal recovery, foreclosure and repossession of collateral? 53% reported that documentations help them to have legal rights from the government. The other methods were 22% of the banks selling their securities to recover their loans and 13% holding of witnesses accountable for repayments. 3% of the banks reported they prefer take legal action against the defaulters. Banks also reported the cases under which they suspend interest chargeable to the borrowers. 58% of the banks would only do so in case of death of the borrower whereas 32% would suspend interest in case the borrower was declared bankrupt. Other circumstances were if the client takes loan fraudulently and disappears completely with 23%. In case of insanity, 9% of the bank would waiver the interest chargeable and 7% if the client is unable to repay and the securities given have been used to recover the amount owing. The other time is when the loan is paid in full.

How do these banks control the amount owed by the clients in the cases above? This is as given in figure 4.3.5 below.

Figure 4.3.5 Control of Loans to Clients
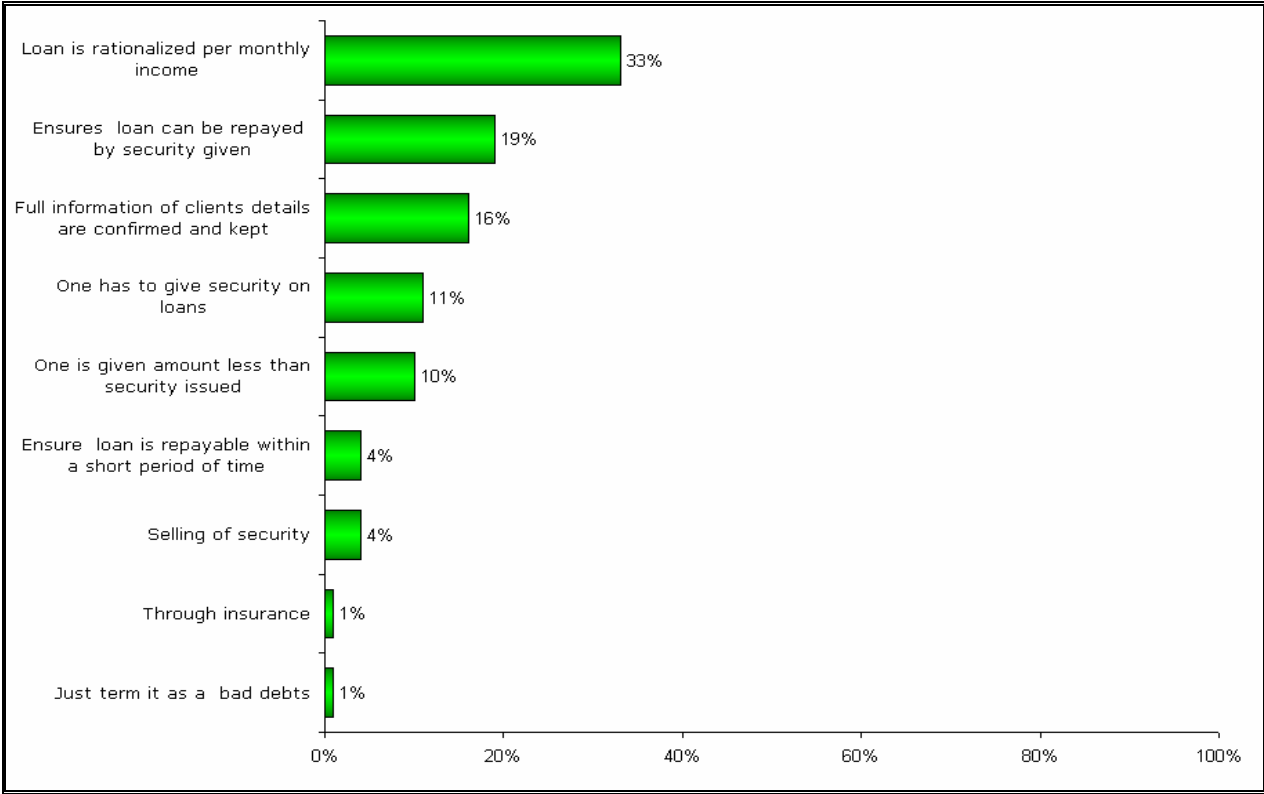
By ensuring that the loan rendered to a client is rationalized as per the monthly income, 33% of the banks apply this to control how much maximum they can lender to a client and for how long. 19% of the banks ensure that the loan owed by the clients can be recovered from the security given for the same. However, only 11% of the banks request for this collateral as a way of loan control. 16% of the banks ensures that they have received cliets information and confirms the same for accuracy before keeping the information.10% of the bank use the collateral given for the loan to determine how much to lent whereby they ensure that the amount lent is lesser compared to the value of the security issued bu the client. 4% of the banks give short term loans to the clients whereas the same percentage sell the securty of the loan to recover the amount lent. 1% of

the banks insure the loan given whereas the same % renders the unpaid amount as bad & doubtful debts.

Lastly question on credit risk assessment was to establish how often the banks carry out an assessment of credit quality of its loan portfolio. The results indicated that most of the banks, 29% undertake this exercise on a daily basis. 14% undertake this weekly, 26% monthly and 19% on quarterly basis meaning after every 3 month.

4.4   Liquidity risk assessment techniques results

Liquidity risk has initially been defined as the prospective risk of earnings and capital arising from the banks inability to meets its liabilities as and when they fall due without incurring unacceptable losses.

In investigating the techniques applied by the bank in assessing this risk, first was to understand the sort of liquidity risks that these banks face. The answer was on causal factors. 47% of banks attributed this it theft, 41% of banks to their clients giving false documentations and 29% of banks due to human error in the process of issuing the loans. Other causes were as a result of fluctuation of the value of security given on loan with 10%, Automated Teller machines (ATM) errors with 8%, death of a client before finalizing the loan repayment as well as fluctuations in foreign exchange rates with 7% of the banks. 6% was attributed to errors and omissions whereas 5% was as a result of fraud.

In addressing the above, 29% of the banks emphasize on employing more experienced and qualified staffs, 28% of the banks ensure that they conduct a thorough check of the documents produced by their clients whereas 19% of them ensure that the security provided is adequate to cover any losses. The other ways were that 10% of these banks ensure that their ATM's are well maintained to avoid any errors, 8% do sell the security held to repay the loans. 7% of the banks always request for the collateral for the loan being thought and the same percentage ensure they closely monitor interest rate changes so that they can also adjust their rates. As for 3%, the client borrowing the money must appear to be responsible.

So do these banks have adequate access to the money markets or other ready sources of cash and what are these sources? 50% of the banks cited that they rely on interbank lending to address their liquidity problems whereas 38% rely on the cash deposits from their clients. Credits from central bank and interest on loans constitute 36% and 31% respectively. Other ready sources are interests from investments with 11%, recovery through insurance with 8% and 7% holding witnesses responsible to repay the loans. Withdrawals of the extra amounts deposited with central banks constitute 3% whereas 1% of the banks sell the company shares and the same percentage depends on the charges on the banks overdraft. As it relates to use of CBK credit, the frequency was as given in the chart n figure 4.7 below

Figure 4.4.1: Usage of Central Bank Credit over the last 12 Month
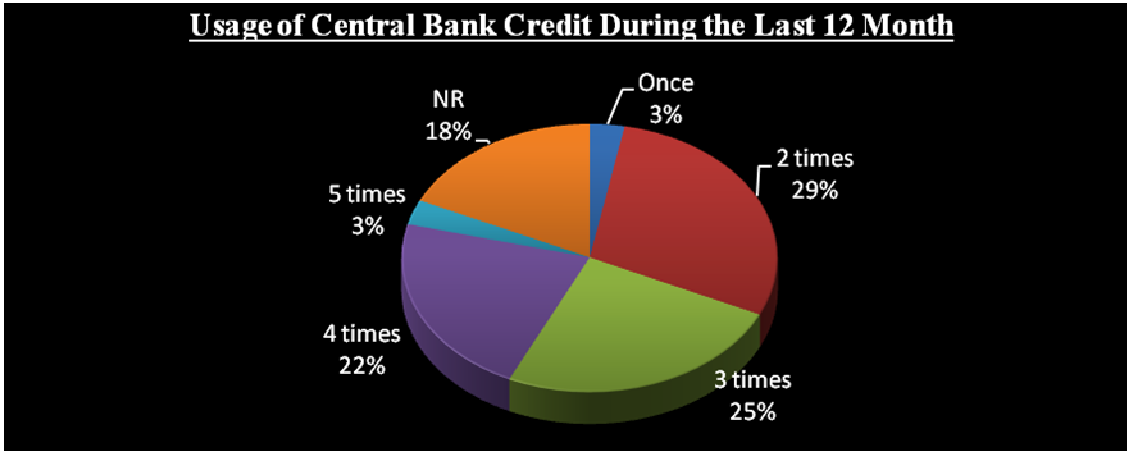
The chart indicates that majority of the banks used the CBK credit twice with 29% whereas 25% of the banks used the CBK credit three times. 22% % of banks used it 4 times with 3% of the banks having used it 5 times or once. 18% of the banks did not respond to this question.

Figure 4.4.2 below gives an assessment of the banks strength with relation to its liquidity risk.

Figure 4.4.2: Banks strength with Relation to Liquidity Risk
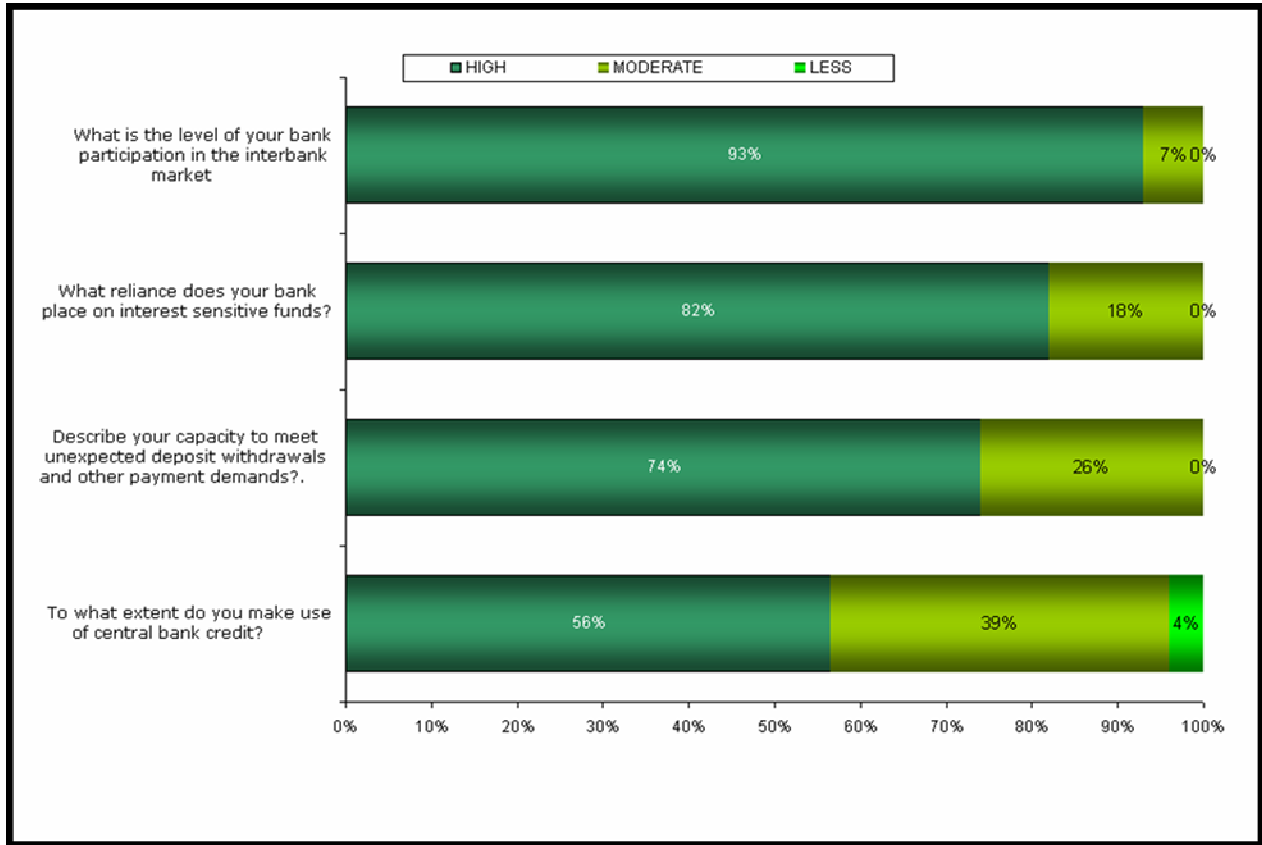
First query had to do with how active commercial banks in Kenya are with relation to their participation in the interbank market. 93% of them indicated high participation with 7% being moderately active. No bank indicated less activity in the interbank market. The second query was to analyze the reliance level that the banks place on the interest sensitive funds. 82% of the banks placed very high importance with 18% terming them as moderately important. Third query related to the banks capacity to meet any unexpected withdrawals and other payments on demand. 74% of banks indicated that they are always ready whereas 26% are moderately ready. Lastly was to what extent these banks use the CBK credit. The results were 56% of banks reported high reliance, 39% moderate and 3% make less use of it.

Lastly on liquidity risk assessment was to assess the liquidity percentage ratios for the last 12 month with relation to the Kenyan commercials banks. These are given by the chart in figure 4.4.3 below

Figure 4.4.3: Liquidity percentage Ratios for the last 12 month
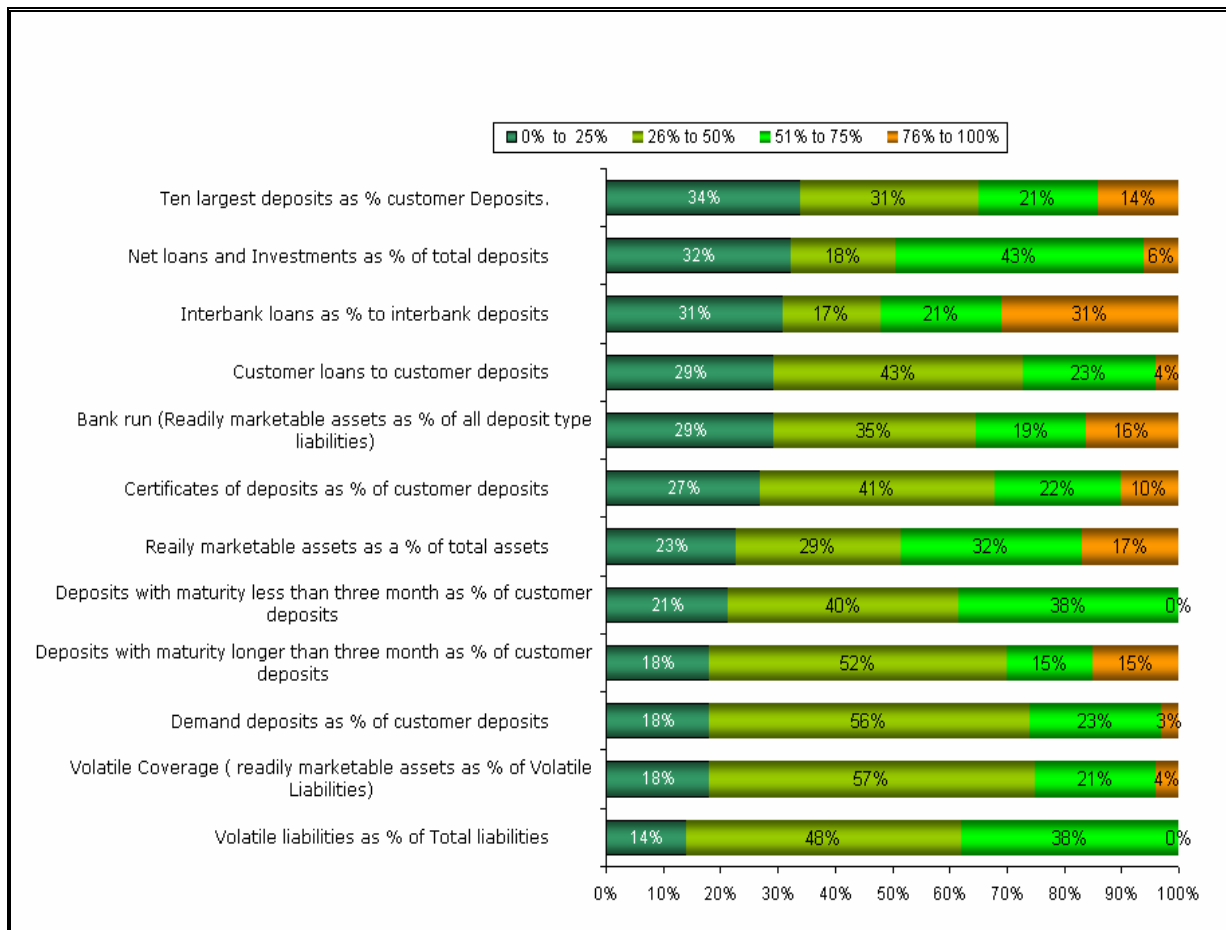
 The first ratio was for the banks to give the percentage of the ten largest deposits as a percentage of customer deposits. For the 34% of the banks, these constitute between 0-25%, 31% of the banks they constitute 26-50% of the deposits, 21% of the banks they constitute fall between 51-75% whereas for 14% of the banks they fall between 76-100 % of the customer deposits. The second was the ration for the net loans as a percentage of total deposits within the banks. For 32% of the banks these fall between 0 -25%, for 18% of the banks thy lie between 26-50%, for 43% of

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the banks they lie between 51-75% whereas for 6% of the banks they lie between 76-100% of the total bank deposits.

The ratio of Interbank loans as a percentage of interbank deposits. 31% of the banks placed it to be between 0-25%, 17% to be between 26-50%, 21% to be between 51-75% and 31% to be between 76-100%. As for the ratio of customer loans as a % of customer deposits, 29% of the banks this is between 0-25%, 43% of the banks its between 26-50%, for 23% of the banks its between 51-75% and only 4 % of the banks raged it to be between 76-100%. The other ration was the bank run, i.e. readily marketable securities as a percentage of all deposit type liabilities. 29% of the banks placed them between 0-25%, 35% to be between 26-50%, and 19% raged this between 51-75% whereas 16% of the banks raged them between 76-100%.

The other liquidity ratio was that of certificate of deposits as a percentage of customer deposits. 27% of the banks raged them between 0-25%, 41% of the banks between 26-50%, 22% of the banks between 51-75% and 10% to be between 76-100%. For readily marketable assets as a percentage ratio of total assets held by the bank, 23% of the banks raged it between 0-25%, 29% of the banks between 26-50%, 32% to be between 51-75%, 17% of the banks rated this to be between 76-100%. There was also a ratio of deposits with maturities less than 3 month as a percentage of customer deposits. 21% of the banks raged this between 0-25%, 40% to be between 26-50% while 38% of the banks raged this between 51-75% with no rating between 76-100% rages. As for deposits with maturities longer than 3 month as a percentage of customer deposits, 18% of the banks raged this to be between 0-25%, 52% of the banks to be within 26-50%, and 15% raged them between 51-75% and the same percentage between 76-100%.

For the last three liquidity ratios, the findings were, demand for deposits as a percentage of customer deposits, 18% of the banks raged this between 0-25%, 56% to be within 26-50%, 23% of the banks between 51-75% while 3% of the banks raged this between 76-100%. As for the volatile coverage being the ratio of readily marketable securities as a percentage of volatile liabilities, 18% of the bank rated them between 0-25%, 57% to between 26-50%, 21% to be between 51-75% while 4% rated this between 76-100%. The last liquidity ratio was that of volatile liabilities as a percentage of the total liabilities. 14% of the banks raged this to be between

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0-25%, 48% to be between 26-50% and 38% of the banks rated this as between 51-75%. None of the banks rated their volatile liabilities ratio to the total liabilities to be within 76-100% range.

4.5   Market Risk Assessment Techniques results

Market risk assessment techniques investigations started with a question requesting the banks to describe the key risks which they face in this area. 62% of the banks cited fluctuation of security values as the key risk, 51% cited fluctuation of the bonds and the real estate's whereas 25% cited changes in the foreign exchange rates and 4% cited of the banks cited loan repayment failure. Only 1% of the banks attributed market risk result of either changes in the value of interest acquired, competition from other banks or human error.

After identifying these, there was the question of what measures the bank has taken to address the issue of market risk and the mitigation strategies it has put in place. The response was as given in the chart in figure 4.5.1 below

Figure 4.5.1: Market risk Mitigation Techniques
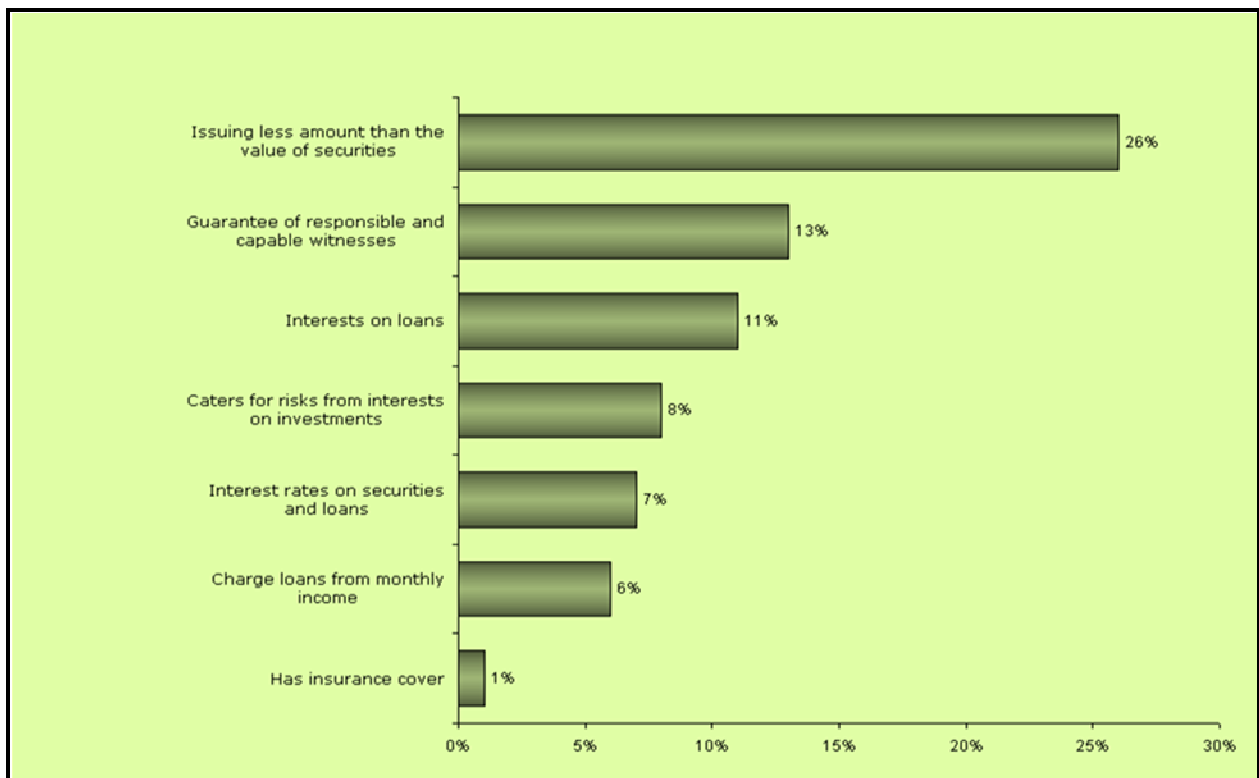
26% of the banks issue loans of lesser value than the interest securing it while for 13% of the banks guarantors are held responsible for the repayment. 11% responded they use interest to cover themselves and 8% cater for risks from the interests on the investments. 7% use interest rates on securities and loans, 6% charge their loans on monthly incomes and 1% insures the loans before lending it to their clients.

As for the reports used by the banks to track their exposure level to the market risk, 66% of the banks did not want to disclose this. However, 15% of the banks use loan repayment trends which may expose the risk, 6% use the market price changes with times experienced whereas 13% cited the use of their past experiences in risk handling.

In addition to this, there was the question on what the most pressing development needs the bank has related to the market risk. According to 16% of the banks, loan security should always be of a higher value then the loan advanced to the client. For 13%, they would prefer the loan to be repaid before there are any changes in the interest rates. The same percentages also would want the banks to first work on previous evidence related to default to ensure that it's used to expose any related future risks. As for 11% of the banks, there is utmost need to improve on investments that the banks engage into. 1% would want the verification of the true value of the security issued before giving out the loan as well as have the loan advanced recovered salary when it comes to personal loans. So how adequate is the pricing system applied to cover against potential risks. 75% of the banks would prefer market price be used to determine the security values and 10% would rather have the security sold to recover the loan. 15% did not respond to this.

Finally for market risk there was needed to assess the strength of the banks risk assessment techniques as given by the chart below. First was to determine the effect level caused by the change in the value of securities held for the commercial loans, caused by fluctuations in market value of the real estate, bonds, commodities, securities, interest rates and foreign exchange. 89% of the banks rated it as high whereas 11% rated it as acceptable. There was then the question of as to the extent to which changes in the foreign exchange rate or interest rate impact on cash holdings in the bank. 75% of the banks rated the effects as high, 9% as acceptable, 10% as moderated and 7% as low. As for the level of change in the value of securities for mortgage loans

caused by fluctuations in market value of real estate and changes in interest rates within the banking institution.72% termed it as high, 27% as acceptable and 1% as being moderate.

With relation to the assessment of the impact level caused by the changes in the foreign exchange rates or interest rates on liquidity, 58% rated it as high, 25% as acceptable and 18% as being moderate. Then the risk level in the value of bonds and marketable securities held as security for loans caused by changes in interest rates, market value, foreign exchange, equity, and commodity. 57% of the banks rated them as high, 25% as acceptable whereas 18% rated the risk as being moderate. All this is illustrated in figure 4.5.2 below.

Figure 4.5.2: Banks strength with relation to Market Risk
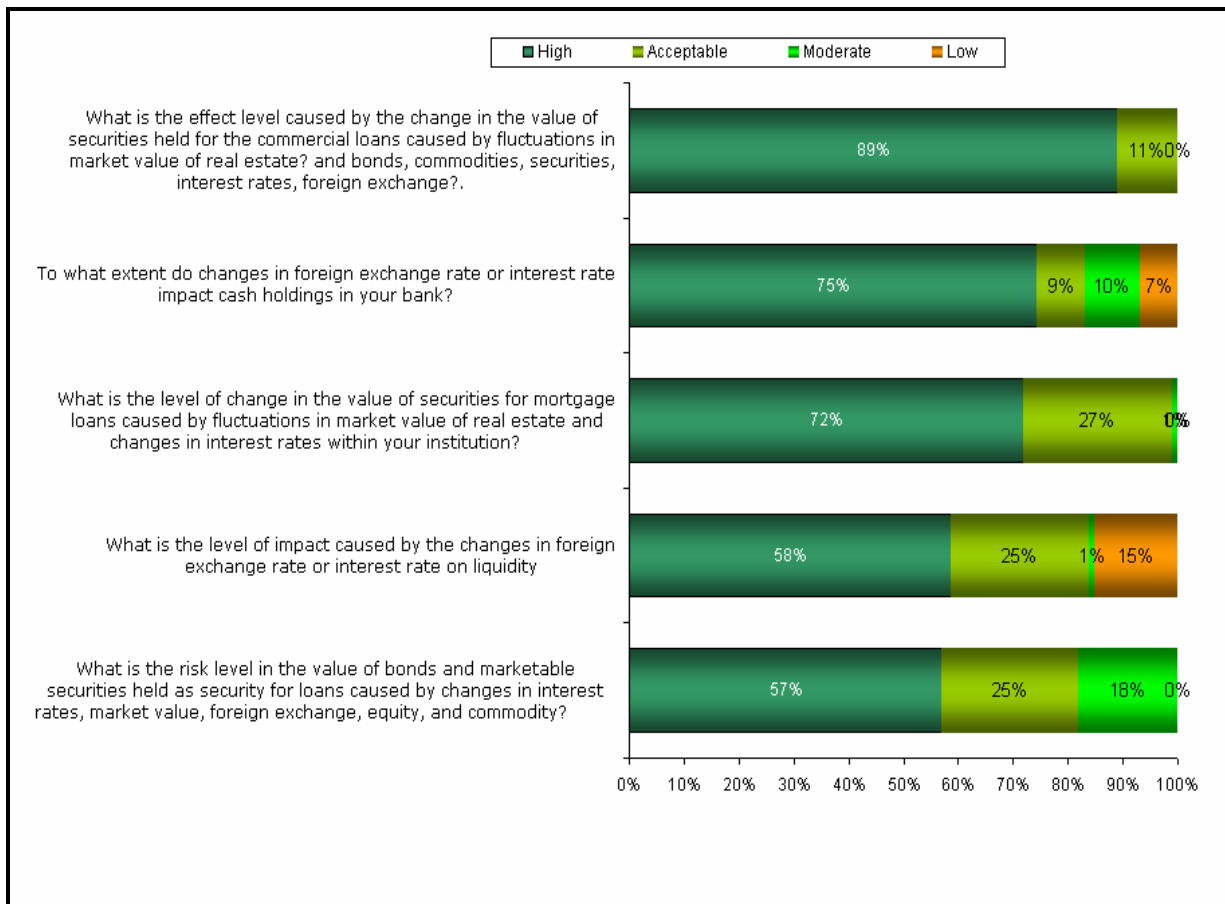
4.6   Operational risk Assessment results

Operational risk being the latest identified risk category within the banking industry, the research started by first requesting the banks to advice what it is that they do consider as causes of operational risk. The results were as given in figure 4.6.1 below

Figure 4.6.1: Operational Risk Causes
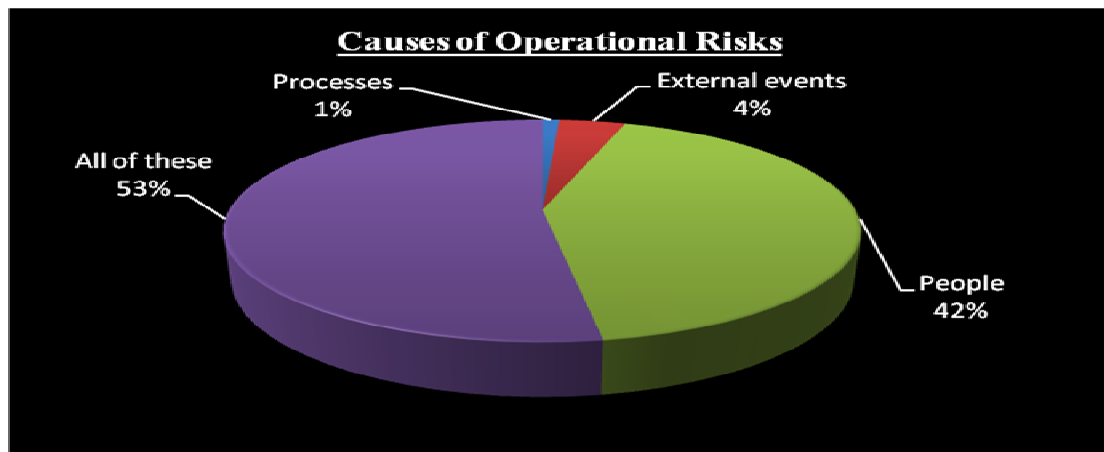
According to 42% of the banks, people are the major cause of operational risks. 1%, of the banks cited processes and 4 % external events. However, for 53% of the banks, they do consider all the three to be causal factors for the operational risk. When asked to clarify this answer, 41% argued that people are the cause of the risks above whereas for 30% of the banks, all of them form operational risks since despite the people being the causal factors, the processes they have put in place would cause the same risks. 8% argued that all these have equal chances of occurrence. 21% banks did not respond to this.

Having identified these, there was a need to assess the operational risks covered by the internal control frameworks which the banks have put n place. These are as per figure 4.6.2 below.

Figure 4.6.2: Operational Risks covered by Internal Controls Framework
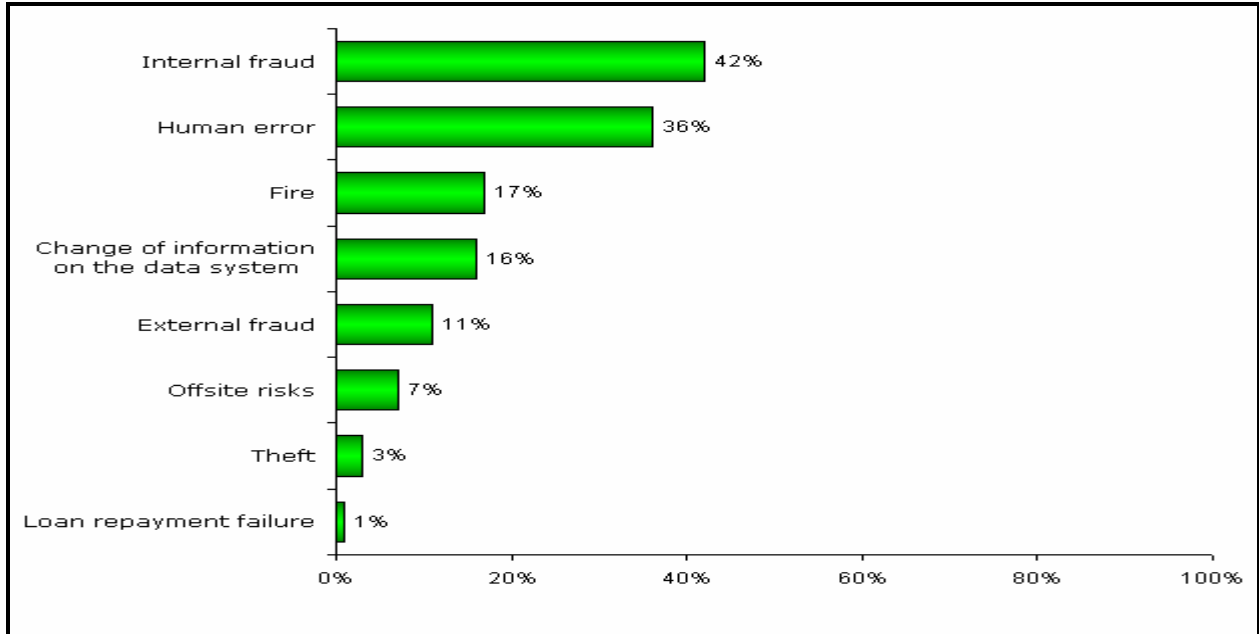
42% of the banks identified internal fraud, 30% human error and 17% fire. Other risk addressed by the internal controls are changes in the information on the data system with 16%, external fraud 11%, offsite risks 7%,ctheft 3% and Loan repayment failure 1%.

With regard to the internal systems used by the institutions, there was a question with the aim of getting more information as to the information technology (IT) and system risks that the banking organizations are faced with. 48% of the banks cited changing of information on the data systems for personal gains as the major risk in IT. This was followed by the system breakdown with 22%. There other was getting values of the documents with 11% of the banks, computer error 3% and fire 1%.

The other operational risk assessment related to the risks that the banks suffered affecting their immediate business continuity. 25% of them quoted competition from other banks, change in the market prices 14% and loss of cash as a result of fraudulence 10%. Changes in the interest rates were 6% whereas the bank location site posed risk according to 1% of the banks. Similar percentage cited fears to do with bank dissolution, human error in the course of normal business

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operations as well as unpaid loans being the other risks threatening the business continuity. This is as illustrated in the graph in figure 4.6.3 below.

Figure 4.6.3: Operation Risks affecting Business Continuity
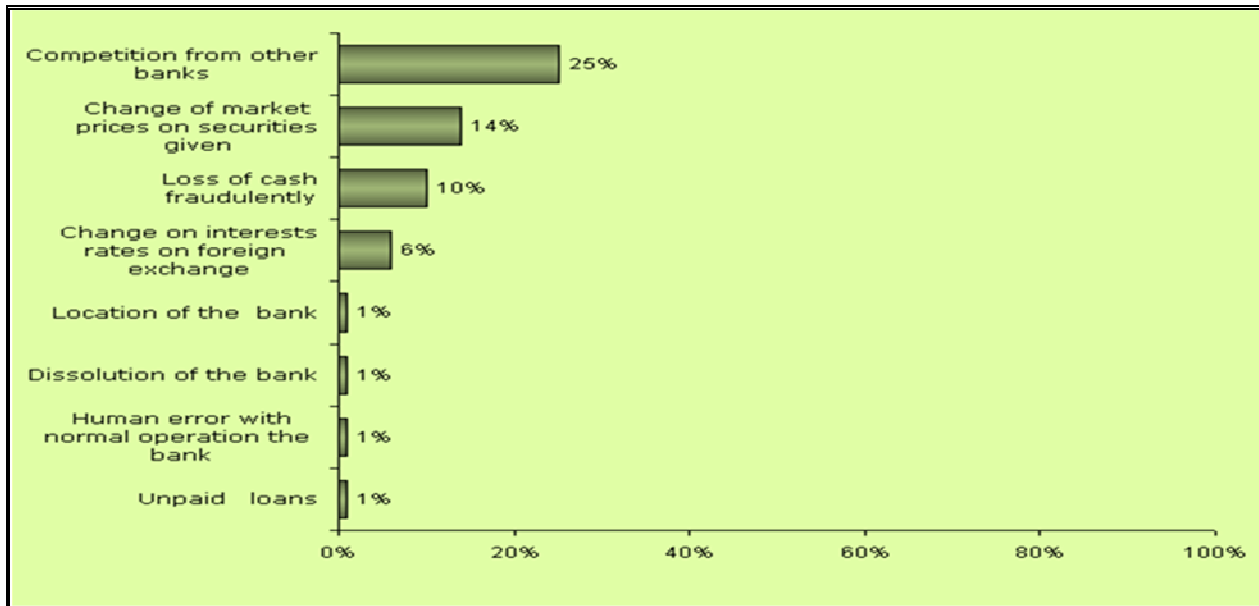
After having identified these, there was need to know the operational risk measurement techniques applied by the Kenyan banks. 13% check on whether the information provided has been altered in any way for the purpose of individual personal gains. 6% undertake thorough document verifications. 4% exercise caution to minimize human error and the same percentage pays great attention as to the ATMs location sites. 1% effect changes in their product prices and similar percentage undertake auditing of its books for information verification.

Finally on the operational risk assessment was to analyze the strength of the banks when it comes to operational risk. First was to find out how these institution rates their offsite cash, quantity, quality as well as the location of their ATM's. 82% of them cited this as high meaning the place great importance on all these, 7% as acceptable and 18% as moderate. The other question was on how internal and external frauds are controlled within the institutions. 59% rated as highly controlled, 29% as acceptable and 12% as being moderate.

From the past experiences of these banking institutions, what was the possibility of someone making fictitious loans for personal gains or altering reports and organizational data. 57% cited that this was highly likely to occur, 17% as acceptable meaning it can occur but not highly likely, 3% as moderate meaning less likely and 23% as low or less likely to occur. The other risk was the possibility of legal action being taken against the banking institution which would have negative repercussions. 25% cited the chance of that happening as high, 36% as being within acceptable level or not highly likely, 26% rated as moderate meaning less likely to occur and 13% as low meaning not likely to occur. Given these, what is the possibility that the bank will be dissolved as it is currently. 20% response was that the chances of bank being dissolved were high, 17 % as not highly likely, 31% as moderately likely and 33% as less likely to happen.

Human error occurrence possibility within these institutions was also addressed. 20% of the banks rated its occurrence possibility as high, 23% as acceptable meaning not highly likely, 20% as moderate that's less likely and 37% as low. Lastly was on possibility of a merger or an amalgamation occurring within their institutions. 18% rated the possibility as high, 29% as acceptable or not highly likely to occur, 47% rated this as moderate, meaning less likely to occur and 6 % rated the possibility of this occurring as low meaning it's not going to occur at least not in the short run. All the above is illustrated in figure 4.6.4

Figure 4.6.4: Banks Strength with Relation to Operational Risk

4.7   Risk Assessment Frequency and Awareness

Having assessed the various techniques applied for risk assessment by the banks, there was need to know how often the risk assessment is carried out. The results were as given in the table in figure 4.7.1 below.

Figure 4.7.1: Table on Risk assessment frequency

Risk Types	Period						
	Total	Daily	Weekly	Monthly	Quarterly	Half	Yearly
Credit Risk	1.00	0.82	0.17	0.01	-	-	-
Strategic Risk	1.00	0.10	0.34	0.47	0.10	-	-
Liquidity Risk	1.00	0.82	0.15	0.01	0.01	-	-
Interest Rate Risk	1.00	0.37	0.40	0.24	-	-	-
Operational Risk	1.00	0.38	0.18	0.22	0.23	-	-

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Price Risk	1.00	0.13	0.14	0.57	0.15	-	-
Regulatory Risk	1.00	0.01	0.09	0.14	0.76	-	-
Reputational Risk	1.00	0.07	0.03	0.16	0.65	0.10	-
Other Risks	1.00	-	0.11	0.06	0.65	0.09	0.08

The results as per the table indicated that credit risk as well as liquidity risk assessment is carried out by 82% of the banks on daily basis. This is mainly to the reason that this forms the biggest risk type proportion that the banks have to bear within their normal business operations. As for the market risk, it was subdivided in its major components being interest rate risk and price risk. Interest rate risk assessment showed a major variation with regard to its assessment frequency. 37% of the banks indicated that they do undertake its assessment on daily basis, 40% weekly and 24% monthly basis. As for price risk, 57% of the banks undertake it monthly, 13% daily, 14% weekly and 15% on quarterly basis. Operational risk assessment frequency indicated that 38% of the banks undertake it on daily basis, 18% weekly, 22% monthly whereas 23% undertake it quarterly. The other risks of which frequencies were assessed were strategic risk, reputational risk and regulatory risks. The outcome was as given in the table above.

After analyzing the frequency at which these risks are assessed, there was the question of the awareness of the available methods used in risk measurement as given in table 4.7.2 below.

Figure 4.7.2; Table on Risk Measurement Techniques

Risk Types	Risk Assessment Methods						
	Total	Back testing	Value at Risk (VaR)	Stress Testing	Gap Testing	Contingency Planning	Other Methods
Credit Risk	100%	4%	92%	3%	1%	0%	0%
Strategic Risk	100%	43%	4%	40%	4%	8%	0%
Liquidity Risk	100%	9%	87%	4%	0%	0%	0%
Interest Rate Risk	100%	14%	74%	12%	0%	0%	0%
Operational Risk	100%	61%	3%	23%	11%	3%	0%
Price Risk	100%	33%	52%	7%	6%	1%	0%
Regulatory Risk	100%	3%	10%	22%	44%	21%	0%
Reputational Risk	100%	1%	9%	21%	28%	41%	0%
Other Risks	100%	0%	1%	3%	6%	16%	74%

The results indicated a high level awareness of the available methods. 92% of the banks reported the use of VaR methods in assessing credit risk, with 87% reporting the use of VaR in liquidity risk assessment, 74% in interest rate risks assessment and 62% in price risk assessment. For operational risk the method mostly applied was back testing. For the other risk reports were as shown in the table above.

4.8   Z-Test for the Data Collected

Figure 4.8: Z-Test for Data Collected

Confidence Level:	**95%**
Group 1: No of Questionnaires Distributed	
Base size:	92
Proportion:	92 (100%)
Group 2: No of Response Received	
Base size:	92
Proportion:	88 (95.65%)
Z Value:	1.518
1-Tail Confidence Level:	93.5% (Not Significant)
2-Tail Confidence Level:	87.1% (Not Significant)

The data received from the banks was subjected to Z test at 95% confidence level to test whether the difference in the response not received from some banks had any significance in the final conclusion. The Z-Value achieved was 1.518. This means that at 93.5% confidence for one tailed test or similarly at 87.1% for two tailed test, the data not received was not significant in drawing the conclusion as to whether banks in Kenya have put in place adequate risk assessment Techniques as per the investigations undertaken.

4.9   Findings and Implications of the Study

The findings of this study have shown that there exists very high lending by the banks to its shareholders and other connected parties such as entities having huge control over the banks. These include the board of directors and the entities controlled by the banks. This could be one of the reasons why most of these banks reported high number of loans which have had their interest rate rescheduled. Rescheduling of loan repayments means there exists a variance between the

initially agreed loan repayment terms compared with the current terms as agreed between the bank and the clients. Most of the loans were 30 days past their due dates.

As for lending controls to mitigate possible risks, results indicated that banks have put in place various measures prior to lending the loans. The most common was that almost all of the banks demand for information relating to the income levels of the borrower so that the loan is rationalized per the monthly income. The borrowers are also required to have accounts with these banks as well as have witnesses with most of the banks requiring that their witnesses be account holders with the bank. Security for the loan is also demanded by most of the banks with the banks giving loans which are below the security value to safeguard them against possible default. Prove of ownership of the security provided has to be given first. Where the borrower is a firm, the copy of registration certificate is required whereas for individuals a letter from the employer as well as details on the terms of employment have to be provided. Insuring of the loans lent against possible defaults is also undertaken by some of the banks inherently passing the insurance cost element to the borrower. In case of default, most banks opt to recover the amount in default by selling of the securities, holding witnesses accountable for the repayment or claiming the amount in default from the insurance companies.

To safeguard against changing interest rates, most of the banks indicated that they do prefer lending loans whose repayment period is short term so as that the loan amount is repaid in total before any changes in interest occur or other factors that could lead to default. They do also suspend interest payable in case of death, bankruptcy, fraudulence, insanity or if the loan in default is recovered by selling of the securities given.

The issues of theft, false documentations, human error as well ATM errors were identified as some of major causal factors resulting to liquidity problems within the banks. This has as led to banks laying more emphasis on recruitment of highly skilled staff of high moral standing, carrying out thorough document verifications before issuing loans as well as ensuring that their ATM machines are regularly updated and located in secure places. When faced with the liquidity problem, most of the banks result to borrowing from money markets, usage of customer cash

deposits and credit from Central Bank. Sale of security for the loans in default also helps improve their liquidity positions.

Fluctuation of the security value held by the banks was also cited as a major cause of market risk followed by the fluctuation in the value of bonds and real estate's and lastly foreign exchange loss. Most of the banks withheld information on the methodologies used to track these fluctuations. They however did indicate that there is a need to improve on the investments the banks engage into so as to cover for any probable losses that may accrue as a result of these fluctuations. With regard to the frequency at which risk assessment is undertaken, most banks indicated that this is usually done either daily weekly or monthly. Rarely is it done beyond this period. They have also have put into usage various methodologies of risk measurement. Back testing is being widely uses in determining market and operational risks. VaR is also widely used for Credit risk assessment, liquidity risk and Market risk assessment especially the interest rate risk aspect

In conclusion, banks in Kenya have put in place various techniques that suit their operating environment in order to keep risks on the check. This is more so for the market, liquidity as well as credit risks. They have put in place strong checks of which rely on the implementation process as well as effective monitoring systems, all aimed at reducing their risk exposure level as well as enable them come up with ways for risk mitigation. They have put in place globally applicable and acceptable risk assessment techniques suitable to the banking industry.

CHAPTER FIVE

5.0   SUMMARY, CONCLUSIONS AND RECOMENDATIONS

5.1   Summary of the study

This study has brought into the fore how complex the issue of risk assessment is. The objectives of this study were to investigate the risk assessment techniques applied by commercial banks in Kenya as well as to assess the risk exposure level of the commercial banks in Kenya. This was with full appreciation that risk assessment involves the process of identifying, measuring and prioritizing risk since it's usually the first process in risk management process.

The study was conducted through the use of a questionnaire distributed to all the forty four banks in Kenya. It confirmed that market risk, credit risk, operational risk as well as liquidity risk form the biggest risk that banks face. It showed that these risks can be better addressed by putting in place various mechanisms that institute checks which are highly workable prior to any lending by these institutions. It's at the lending stage where most of the risk that occur as a result of lending can be controlled much more efficiently. Once the lending has been done without proper checks, the repercussions and all the measurement methodologies applied later on only result to more funds being spent thus adding more losses to the bank.

For those risks which arise not as a result of lending or customer default but as a result of fraud, human error or theft from banks or ATMs, it's upon those setting up the banks & installing ATMs to first ensure that they are located in secure places. Most of the operational loss was reportedly caused by theft. Human error problem as well as internal and external frauds were also reported as major concerns by the financial institutions. Banks should invest in systems and technologies that put checks and limits accessibility of the system use to the individuals responsibly within the bank. This is to enable value addition to the training programs being given to the recruited staff who should be of high moral standing.

The current existing risk measurement methodologies are similar to those being applied by most major banks globally. This underscores the need for the Kenyan commercial banks to keep on updating these approaches especially those proposed by the Basel Accord. It's up to the CBK to

institute guidelines that in line with Basel requirements so as to help keep the issue of risk within the banks on the check.

5.2   Conclusion of the study

The findings of this study have revealed that Kenyan commercial have been able to institute various risk assessment techniques to address various challenges of which they face in the cause of their operations as well as ensure the that the risk is kept on the check..

The study has outlined all the major components of risk and the various approaches currently under application by the banks in addressing the challenges which come as a result. Banking Risk cannot be done away with completely since it forms part of the lending business which these institutions engage in. It can however be minimized so as to avoid the repercussions brought by it such as bank failure which has been witnessed in Kenya before. It's however upon the respective banks to keep strong checks and strengthen their risk control departments. Adherence to the CBK guideline is critical so as to ensure that on the minimum the checks put in place are able to achieve the required results. What CBK gives are the guidelines and it still remains upon the individual Banks to put up mechanisms that are in line with their business objectives to address the diverse risks in the course of their business while undertaking cost benefit analysis of their application methodologies.

As for the CBK, it has an oversight role of ensuring that banks are run in a transparent manner. It should work towards enhancing its current checks on the banking risk management guidelines so as to reduce the issue of bank failure. One of the ways in which it can do this is by adopting or borrowing some of the recommendations under Basel Accord on risk management. This will help ensure that the issued guidelines are well enhanced as well as protect the customer deposits within these institutions. Basel has been adopted in the developed world but has its challenges. It's up to the CBK to assess and recommend which elements of Basel suit well to the local market as well as study how its implementation has been applied in other economies which are similar to the Kenyan Economy. This will help ensure there are strong updated controls which are in line with the internationally accepted standards on risk management, thus result to better risk assessment techniques.

5.3   Policy Recommendations

There is need for the banks to keep up on upgrading their risk assessment techniques so as to come up with more innovative ways of risk mitigation. This is more so to the changing banking environment. Though there is much appreciation on how the banks in Kenya have adopted high levels of risk assessment techniques and domesticated them to suit the Kenyan market, there is need for regular upgrades with the changing market and environmental trends.

In addition to this, there is too much lending by the banks to entities which have control over the banks, bank executives as well as board of directors. Bank loans should be given in the basis of clients' ability to repay the loan and not as for the position held. The explanation received however was that the loans are advanced to them as customers with no added privileges.

With CBK having given the Credit reference bureaus go ahead to start operations as from 10th of August 2010, banks as well as borrowers are bound to benefit significantly. Credit reference bureaus will collate, compile and disseminate credit information on borrowers within the banking sector through a fully electronic system. Banks will then be submitting credit information and request to obtain credit references n a potential customer as part of its risk management. It's expected that banks will make maximal use of this to enhance their risk assessment techniques.

5.4   Limitations of the Study

The study focused only on banks based in Nairobi. This was because all the banks in Kenya have their head offices in Nairobi. This means that the results obtained were limited in terms of geographical coverage. There is a possibility that maybe results would have changed one way or another was the study to be conducted in the banks upcountry branches.

The other limitation is that the research tool used for this study was a questionnaire. Though all caution was taken with great attention to details when drafting. There are other methods which include interviews, Observations and use of secondary data like financial records to assess different banks risk levels. These methods could maybe have given variant results.

5.5   Suggestions for further study

I would suggest that further studies be undertaken on the effects of the reported high lending to the entities having huge controls over the banks as discovered during this study. This will help explain whether this is the resultant factor for deferring interest rate payments by these banks or the resultant cause of defaulted loan payments.

Further research should also be undertaken on what effect would arise were Kenyan banks made to adopt the Basel guidelines on risk assessment. What effect it would have in the Kenyan banking sector were it to be endorsed by CBK. Basel implementation would come with additional costs to the banks and the question would be whether its benefits would be more as compared to its implementation costs.

Lastly, further research should also be undertaken of banks risk assessment techniques, giving wider coverage of the banks in the rural areas and maybe applying a different research tool. The research should as well encompass information from the borrowers as to what factors contribute to them defaulting on their loan payments.

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Appendices

Appendix 1: Commercial Banks in Kenya as At 31st Dec 2008

	Commercial Banks In Kenya	**No of Branches**
1	Kenya Commercial Bank Ltd	144
2	Barclays Bank of Kenya Limited	117
3	Equity Bank Ltd	102
4	Co-operative Bank of Kenya Ltd.	59
5	National Bank of Kenya Ltd.	39
6	Family Bank	38
7	Standard Chartered Bank (K) Ltd.	35
8	K-Rep Bank	31
9	Commercial Bank of Africa Ltd.	18
10	Diamond Trust Bank of Kenya	22
11	CFC Stanbic Bank Kenya Ltd	15
12	National Industrial Credit Bank	15
13	Chase Bank (K) Limited	13
14	Eco Bank Ltd	13
15	Investments & Mort. Bank Ltd.	13
16	Trans-National Bank Ltd.	12
17	Consolidated Bank of Kenya Ltd.	11
18	Imperial Bank Limited	11
19	First Community	11
20	Prime Bank Limited	11
21	Fina Bank Limited	11
22	Housing Finance	10
23	African Banking Corporation.	10
24	Southern Credit Banking Corp.	10
25	Gulf African Bank	9
26	Bank of Baroda Kenya Limited	9
27	Savings & Loan	9
28	Bank of Africa Ltd	7
29	Giro Commercial Bank	7
30	Fidelity Commercial Bank Ltd.	6
31	Guardian Bank Limited	5
32	Bank of India (K) Ltd	5

33	Equatorial Commercial Bank Ltd.	5
34	Oriental commercial Bank Ltd	5
35	Paramount-Universal Bank Limited	5
36	Habib Bank A.G. Zurich	4
37	Credit Bank Limited	4
38	Citibank N.A.	3
39	Dubai Bank (K) Ltd	4
40	Habib Bank Limited	3
41	Middle East Bank Kenya Ltd.	2
42	City Finance Bank Ltd	1
43	Development Bank of Kenya Ltd.	1
44	Victoria Commercial Bank	1
	Source: Central Bank of Kenya FDS study for Dec 2008	866

Appendix 2: Letter of Introduction

Dear Sir / Madam

I am a postgraduate student at University of Nairobi, School of Business

As part of my MBA (Finance) course requirements, I am undertaking a research project, "An Investigation of Risk Assessment Techniques Applied by Commercial Banks in Kenya"

To enable me fulfill the information requirement of my study, I 'm humbly requesting you to help by filling in the attached questionnaire. The information collected will be used fully for academic purposes and will be treated with strict confidence. It won't be used for any other purpose other than this academic research

I will be most grateful if you can provide the information requested and any other which you may deem necessary to this research.

I look forward to your valuable assistance and thank you in advance

Sincerely yours

Tom Gichuru Wahome

MBA (Finance) Student

University of Nairobi

Appendix 3: Questionnaire

Section I: Demographic Data

1. What title do you hold in the bank? _

2. What is your Gender?   Male [   ]   Female [   ]

3. What is your age bracket?   below 30 yrs [   ]   31 – 40 yrs [   ]   over 40 yrs [   ]

4. How many years have you been worked within the banking sector? _ _ _ _ _ _ _ _ _ _ _ _ _ _

5. How many years have you worked in the risk control department?_ _ _ _ _ _ _ _ _ _ _ _ _ _ _

6. What minimum qualification do the staff n your department have_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

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Section II: Risk Assessment

Credit Risk Assessment

	Loan portfolio structure Review	Percentage formation of the Loan Portfolio			
1	**Of the total loan portfolio extended by the bank, kindly tick the most appropriate % classification**	**1 % to 25%**	**26% to 50%**	**51% to 75%**	**76% to 100%**
1.a	Loans to Borrowers with aggregate exposure lager than 5% of the bank portfolio				
1.b	Loans to banks shareholders and connected parties				
1.c	Loans of which interest repayment terms have been rescheduled or otherwise changed since granting loans				
1.d	Loans of Which interest or principal payment is more than 30 days past due date including those with capitalized interest				
1.e	All loans classified as substandard, doubtful or loss				

2		strong	Acceptable	Moderate	Weak
2.a	How do you rate the level of cash management within your institution?				
2.b	How do you rate the level of personal lending within your institution?				
2.c	How do you rate the level of mortgage lending within				

	your institution?				
2.d	How do you rate the level of commercial lending within your institution?				
2.e	How do you rate the level of Agricultural Lending within your institution?				
2.f	How do you rate strategic management within your institution?				
2.g	How do you rate the technology level within your institution?				
2.h	How would you rate the recovery rate for the funds issued as loans to the customers?				

3	How often does the bank offer credit to related parties below. Kindly tick appropriately	Highly	Moderate	Less	Never
3.a	Shareholders with more than 5%				
3.b	Shareholder with less than 5%				
3.c	Board of Directors				
3.d	Executive management				
3.e	Entities Controlled by the Bank				
3.f	Entities having control over the Bank				
3.g	Close relative of any of the Above				

4. What are the criteria used for granting loans? Specify any specific limits, ratios and so forth used in the evaluation process

_____
_____
_____

5. Has your bank developed a methodology for identifying and measuring credit risk for your internal needs? Kindly describe it

_____
_____
_____

6. Describe any formalized credit policies, procedures and underwriting criteria for the identification of the target markets

_____

_____

_____

7. Describe the procedures for Handling problematic loans

_____

_____

_____

8. What instruments or remedies do you have to ensure that borrowers repay their loans to the bank

_____

_____

_____

9. What mechanisms do you have for legal recovery, foreclosure and repossession of collateral?

_____

_____

_____

10. At what point do you suspend interest chargeable on the overall amount owed by a client?

_____

_____

_____

11. How do you control the amount owed by a client in the case above?

_____

_____

_____

12. How often does the bank carry out an assessment of credit quality of its loan portfolio?

_____

_____

_____

Liquidity Risk Assessment

1.   Describe the Key Liquidity risks faced by your bank

_____

_____

_____

2. What are your bank strengths as far as this risk is concerned?

_____
_____
_____

3. Do you have adequate access to the money markets or other read sources of cash? Please describe other sources

_____
_____
_____

4. How many times did you use central bank credit in the last 12 month?

_____
_____

5. What other sources of funding do you have available in case of liquidity problems?

_____
_____
_____

6. **Kindly tick one the Most Appropriate for your Bank (✔)**	HIGH	MODERATE	LESS	NEVER
a. What is the level of your bank participation in the interbank market				
b. What reliance does your bank place on interest sensitive funds?				
c. To what extent do you make use of central bank credit?				
d. Describe your capacity to meet unexpected deposit withdrawals and other payment demands?				

7. **Kindly tick only ONE that is the most appropriate % for your bank of the given ratios (✔)**	0% to 25%	26% to 50%	51% to 75%	76% to 100%
a. Readily marketable assets as a % of total assets				
b. Volatile liabilities as % of Total liabilities				
c. Volatile Coverage (readily marketable assets as % of Volatile Liabilities				

d. Bank run (Readily marketable assets as % of all deposit type liabilities)				
e. Customer loans to customer deposits				
f. Interbank loans as % to interbank deposits				
g. Net loans and Investments as % of total deposits				
h. Demand deposits as % of customer deposits				
i. Deposits with maturity longer than three month as % of customer deposits				
j. Deposits with maturity less than three month as % of customer deposits				
k. Certificates of deposits as % of customer deposits				
l. Ten largest deposits as % customer Deposits				

Market Risk Assessment

1.   Describe the key risks faced n this area

_____
_____
_____

2.   What strength does your bank have in this risk area

_____
_____
_____

3.   Describe the reports used to track exposure of this risk

_____
_____
_____

4.   What are the most pressing developments needs for your bank as far as this area is concerned?_____
_____
_____

5.   How adequate is the pricing system applied to cover against potential risks?

_____
_____
_____

6.	Kindly tick one the Most Appropriate for your Bank (✔)	High	Acceptable	Moderate	low
a.	To what extent do changes in foreign exchange rate or interest rate impact cash holdings in your bank?				
b.	What is the level of impact caused by the changes in foreign exchange rate or interest rate on liquidity/ investment opportunities at your bank?				
c.	What is the risk level in the value of bonds and marketable securities held as security for loans caused by changes in interest rates, market value, foreign exchange, equity, and commodity?				
d.	What is the level of change in the value of securities for mortgage loans caused by fluctuations in market value of real estate and changes in interest rates within your institution?				
e.	What is the effect level caused by the change in the value of securities held for the commercial loans caused by fluctuations in market value of real estate? and bonds, commodities, securities, interest rates, foreign exchange?				

Operational Risk Assessment

1. What do you consider as the sources of Operational risk?
(a) People (b) Processes (c) Systems (d) External events (e) All of these

2. Kindly clarify your above answer.

_____
_____
_____

3. Describe the risks covered by your internal control framework

_____
_____
_____

4. What Information Technology (IT) and systems risks do you face?

_____
_____
_____

5. Kindly describe the information security risks faced by your bank

_____
_____
_____

6. What risks related to business continuity do you face in your bank?

_____
_____
_____

7. Kindly explain the operational risk measurement techniques applied by your bank

Operational Risk Assessment	**Strong/ high**	**Acceptable**	**Moderate**	**Weak /low**
How do you rate the control level of offsite cash, quantity, quality, location of ATMs in your institution?				
From the past, what would you say is the possibility of someone to make fictitious loans for personal gains or altering reports and organizational data?				
What is the possibility & frequency rate of Human				

error within the normal operations in your institution?					
What is the possibility & frequency rate of legal action being taken against the institution?					
How would you rate the possibility of Mergers/ amalgamation in your institution?					
What is the possibility of dissolution of your bank currently?					
How is internal/external fraud controlled in your institution? (kindly explain)					

8. Do you have any vault cash insurance service provider in your bank?   Yes ( )No ( )

9. Does our organization have a policy to cover against losses that might occur from legal actions against it?   Yes ( )   No ( )

Section III: Risk Assessment Frequency and Awareness

	Kindly the appropriate rate at which risk assessment process is carried out in your institution? Please tick (√) appropriately inside the cell the most important					
1						
	RISK TYPES	Daily	Weekly	Monthly	Quarterly	**Half Yearly**	Yearly
a	**Credit Risk**						
b	**Strategic Risk**						
c	**Liquidity Risk**						
d	**Interest Rate Risk**						
e	**Operational Risk**						
f	**Price Risk**						
g	**Regulatory Risk**						
h	**Reputational Risk**						
i	**Other Risks**						

		Back testing	Value at Risk	Stress Testing	Gap Testing	Contingency Planning	Other Methods
2	In your Opinion, what is the most appropriate measure of risk? Please tick (√) appropriately inside the cell the most important						
	RISK TYPES	**Back testing**	**Value at Risk**	**Stress Testing**	**Gap Testing**	**Contingency Planning**	**Other Methods**
a	**Credit Risk**						
b	**Strategic Risk**						
c	**Liquidity Risk**						
d	**Interest Rate Risk**						
e	**Operational Risk**						
f	**Price Risk**						
g	**Regulatory Risk**						
h	**Reputational Risk**						
1	**Other Risks**						

Thank you for your cooperation.