

**EFFECTS OF CREDIT RISK AND WORKING CAPITAL ON CAPITAL ADEQUACY
FOR COMMERCIAL BANKS IN KENYA.**

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DECLARATION

I declare that this research project is my original work and has not been submitted for an award of a degree in any other University for examination/academic purpose.

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LIST OF ABBREVIATIONS

CBK- Central Bank of Kenya

ESCB- European System of Central Banks

IRC- Incremental Risk Capital

KCB- Kenya Commercial Bank

KRIs- Key Risk Indicators

OTC- Over the Counter

PIT- Point in Time

TTC- Through the Cycle

WCI- Weighted Composite Index

ABSTRACT

Capital adequacy has been constantly growing in the banking sector in Kenya and is a key factor in determining the continuity of the commercial banks in Kenya. However capital adequacy is affected by such factors as working capital ratio, credit risk and the size of the bank in terms of total assets held. The purpose of this study was to provide a better understanding on the factors affecting capital adequacy in the commercial banks in Kenya. Based on this research objective, a review of the relevant literature has been conducted, which was used to guide this study's data collection. A descriptive research design was employed. The target population of interest in was all the 43 commercial banks in Kenya. The data was collected from the secondary sources. The data was obtained from the CBK financial reports of 2013 for all the banks in Kenya and then analyzed using SPSS version 20. The findings have been presented in tables for easy interpretation and report writing. The study has established that there is direct relationship between capital adequacy, credit risk, working capital ratios and size of the bank. The study findings indicated that, the capital adequacy of the commercial banks and working capital has positive and strong correlation which is also significant tested at 5% level. This is as indicated by the Pearson coefficient value of 0.861 which is a strong and positive correlation coefficient. Thus, the findings indicate that there is a strong positive association between capital adequacy and working capital.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Banks are required to have a minimum amount of capital to be able to absorb losses and still operate as going concerns. However, during the recent crisis, the losses that banks suffered in their trading books have far exceeded minimum capital requirements (BCBS, 2010). As a result, the Basel Committee have undertaken an extensive revision of bank regulation which has resulted in several new measures (BCBS, 2010). To increase the loss-absorbing capacity of bank capital the Basel Committee have introduced two additional capital requirements for the trading book, the “incremental risk capital” charge (IRC) and the stressed value-at-risk. The IRC captures credit risk in (unsecuritized) trading instruments that is the risk of losses from default and credit migration events. It was introduced to address the shortcomings of the existing value at risk framework for the trading book based on the assumption that the bank is exposed to securities price movements up to 10 trading days. The recent crisis has shown that shocks can last much longer and, due to market illiquidity, banks may be locked in their positions and unable to stop accumulating losses. The forced extension of the investment horizon leaves banks with substantial exposure to credit risk, hence the need for a new capital charge (Berg, 2010).

The IRC is meant to measure the credit risk in a trading portfolio over a period of 1 year (capital horizon). The assumed illiquidity period (called liquidity horizon) should not be less than three months. At the end of the liquidity horizon, banks are assumed to rebalance their portfolio to reproduce the level of risk they had at the beginning of the period. The logic behind this

“constant level of risk” assumption is that banks, even in a crisis, will need to take on risk in order to remain profitable. Portfolio rebalancing at the end of the liquidity horizon will affect those assets that have migrated to a different credit rating. Thus, the new rules establish a relationship between migration risk and liquidity risk. This entails that close attention should be paid to the type of ratings employed to measure the probability of rating migrations (Carey, 2001).

As shown by Kealhofer et al (1998) and Kealhofer (2003) there is a substantial difference in migration and default patterns between point-in-time (PIT) ratings and through the cycle (TTC) ratings. A through-the-cycle rating is typically produced by rating agencies and evaluates the performance of a company over the medium to the long-term. The objective is to arrive at a stable rating that is not affected by changes in a company’s outlook due to temporary variations in economic conditions. These types of ratings are particularly suitable for long term institutional investors (Carey and Hrycay (2001). Basel regulators also favour the use of TTC ratings as they dampen the procyclicality of capital requirements. PIT ratings on the other hand, focus on the short term performance of a company. These have mostly been used by banks as they are interested in the ability of a firm to repay its loans, which are typically short term. Interestingly, in order to provide ratings that are more in line with current conditions - also following criticism for TTC ratings’ inaccuracy during the South-East Asian crisis and more recently the Enron and WorldCom debacles and the subprime crisis - rating agencies have now started to provide PIT ratings alongside TTC ones. For an analysis of the properties of both types of ratings see, for example, Kealhofer et al (1998), Carey and Hrycay (2001), Kealhofer (2003) and Kou and Varotto (2008).

During the recent crisis, securities prices have changed considerably across markets and types of financial instrument. Although credit risk (in the form of default and migration risk) has undoubtedly played a role, a lot of the price variation was likely related to market risk factors, such as changes in risk premia (Berg 2010). This conclusion is also consistent with the finding in Elton et al (2001) and Gieseke et al (2009) who show how risk premia may have a larger effect on bond returns than default risk factors. To address this point, the Basel Committee has introduced, on top of the IRC, another capital add-on designed to make bank capital able to absorb sharp negative price changes in a crisis. Price risk is measured with a value-at-risk model estimated under stressed market conditions. To arrive at the total capital for the trading book, banks will need to add the IRC and stressed VaR to the current VaR of their trading portfolios. The modern financial system in Kenya may be traced to the trade that existed between Kenya and India in the 19th Century when National Bank of India commenced operations in Mombasa in 1896. The next bank to be established was Standard Bank of South Africa in 1910, followed by National Bank of South Africa in 1916. This bank merged with Colonial Bank and Anglo-Egyptian Limited in 1926 to form Barclays Bank (DCO), which is the present day Barclays Bank of Kenya Limited. National Bank of India later changed to National and Grindlays Bank, while Standard Bank of South Africa later changed to Standard Bank Limited (Dunn, 2006).

Another wave of bank entries into Kenya occurred in the 1950s with the establishment of Nederlandsche Handel-Maatschappij in 1951 (which changed to ABN), Bank of India and Bank of Baroda in 1953, Habib Bank (Overseas) 1956, and the Ottoman and Commercial Bank of

Africa in 1958. KCB was formed by splitting the National and Grindlays Bank into KCB and Grindlays Bank International (Kenya) Limited in 1971 (Elton, 2001).

Kenya gained independence from Britain in 1963. The post-independence period was one of tremendous economic growth characterized by conscious government policy to transfer economic activity into the hands of indigenous Kenyans. The banking sector was no exception. In 1966, CBK was formed under the Central Bank of Kenya Act of the same year. The Bank's principal objectives were to regulate the issue of notes and coins, to assist in the development of sound monetary, credit and banking system in Kenya conducive to the orderly and balanced economic development of the country and stability of the local currency (Israel, 2001). Further, to serve as banker and financial advisor to the government. The supervisory powers of Central bank over commercial banks and financial institutions were designed to safeguard customer deposits in banks and other financial institutions. It has the power to impose capital requirements on banks (KCB, 2003).

In 1967, when CBK took over management of the financial system, the banking system consisted of 8 foreign Banks: Bank of Baroda, Bank of India, Habib Bank, Ottoman Bank, Standard Bank, Barclays Bank, the General Bank of Netherlands and National and Grindlays Bank. In 1974, two American banks were established: First National Bank of New York and First National Bank of Chicago. Local banks included: Co-operative Bank of Kenya (1968) and the National Bank of Kenya (1968). The number of commercial banks continued to expand and by 1986 commercial banks in Kenya numbered 24 with 15 of them being foreign owned (Mullei, 2006).

1.1.1 Credit Risk

Adequate capital is required for banks to operate efficiently because it provides protection against failure. The critical question is how much, and what type of capital a bank needs to hold so that it has adequate protection (Kou, 2008). Capital represents the portion of the bank's liabilities which does not have to be repaid and therefore is available as a buffer in case the value of the bank's assets decline. Banks do not always make profit, so capital is necessary to act as a cushion when banks are impacted by large losses. In the event that the bank's asset value is lower than its total liabilities, the bank becomes insolvent and equity holders are likely to choose to default on the bank's obligations (McAleer, 2009).

Regulators prefer more capital, so as to ensure that insolvency risk and the consequent system disruptions are minimised. The Regulator's primary concern is sufficient capital to buffer a bank against large losses so that deposits are not at risk, with the possibility of further disruption in the financial system being minimized. Regulatory capital is a standardised calculation for all banks in Kenya (Masai and Mullei, 2006), however banks would wish to hold the minimum level of capital that supplies adequate protection, since capital is an expensive form of funding, and it also dilutes earnings. This can also be known as economic capital this is the minimum capital requirement in a going concern for continuous operation, and it is only concerned with holding enough capital to ensure its survival. Economic capital was originally developed by banks as a tool for capital allocation and performance assessment. For these purposes, it did not need to measure risk in an absolute, but only in the relative sense. Over time, with advances in risk quantification methodologies and the supporting technological infrastructure, the use of

economic capital has extended to applications that require accuracy in the measurement of risk (Mullei, 2006).

Although, economic capital has evolved sufficiently to be used alongside regulatory initiatives, it should remain a hypothetical measurement, and be used primarily as a basis for risk adjusted performance measurement and risk-based pricing (Kealhofer, 2003). This is because if economic capital is used to set minimum capital requirement, banks will have a conflict of interest in producing low estimates to minimise its capital holding. And since economic capital modelling is an internal measurement, there is no standardisation across the banking industry, which in turn, makes regulation difficult (Carey, 2001).

1.1.2 Working capital

For investors, the strength of a company's balance sheet can be evaluated by examining three broad categories of investment quality: working capital adequacy, asset performance and capitalization structure. A company's current position has little or no relevance to an assessment of its liquidity. Nevertheless, this number is prominently reported in corporate financial communications such as the annual report and also by investment research services. Whatever its size, the amount of working capital sheds very little light on the quality of a company's liquidity position. The ubiquitous current ratio, as an indicator of liquidity, is seriously flawed because it's conceptually based on a company's liquidation of all its current assets to meet all of its current liabilities. In reality, this is not likely to occur. Investors have to look at a company as a going concern. It's the time it takes to convert a company's working capital assets into cash to pay its current obligations that is the key to its liquidity (Duffie, 2005).

Banks' main business credit creation i.e. collecting deposits from the public and lending to those who require it. Thus, they don't have much of inputs to preparing a product (manufacturing) which requires much initial capital to set up a business operation. Their main business is lending and receiving the loans back plus interest. However, banks use much more leverage than ordinary businesses, in part because their fixed assets are small relative to the volume of their 'sales' simply because the business need a desk to lend money, not a factory (Bhaduri, 2007).

So, the bank's financial statements, if one tried to organize them the way an ordinary company's statements are organized, would be all out of proportion; Little plant and equipment. No inventory. Huge accounts receivable but much of it not for years. Therefore, the appropriate definition of working capital in the banking industry is all assets likely to 'turn' within one year less all liabilities due within one year. However, some of the amounts due on a single loan are coming in this year and some aren't. Banks have therefore to divide the accounts of individual borrowers into short term and long term for effective determination of their working capital. Similarly, some deposits will be drawn out within one year and some won't (Glyn, 2013).

Banks have other, more sophisticated reports, which tell their audiences about such aspects of their business as type of borrower, estimated net balance of assets and liabilities subject to interest rate changes within different time periods, etc. These are fairly new and well worth understanding.

1.1.3 Capital Adequacy

The need for adequate capital to a bank cannot be over-emphasized. With this a bank can absorb operating losses as the bank continues with its operations. It enables the bank to support the basic infrastructure of the business and to maintain public confidence. It shows shareholders are

prepared to make funds permanently available to support the business. Further, it protects uninsured depositors and other stakeholders. It keeps the cost of deposit insurance low as it reduces the chances of bank collapse. Capital is also important in order to acquire real investments that can allow banks to provide financial services (Cornett, 2004).

Capital adequacy is the amount of capital a bank or other financial institution has to hold as required by its financial regulator (Bhaduri, 2007). This is usually expressed as a capital adequacy ratio of equity that must be held as a percentage of risk-weighted assets. These requirements are put into place to ensure that these institutions do not take on excess leverage and become insolvent. Capital requirements govern the ratio of equity to debt, recorded on the assets side of a firm's balance sheet. They should not be confused with reserve requirements, which govern the liabilities side of a bank's balance sheet in particular, the proportion of its assets it must hold in cash or highly-liquid assets (Bindseil, 2004).

A key part of bank regulation is to make sure that firms operating in the industry are prudently managed. The aim is to protect the firms themselves, their customers, the government (which is liable for the cost of deposit insurance in the event of a bank failure) and the economy, by establishing rules to make sure that these institutions hold enough capital to ensure continuation of a safe and efficient market and able to withstand any foreseeable problems (Berg, 2010).

The main international effort to establish rules around capital requirements has been the Basel Accords, published by the Basel Committee on Banking Supervision housed at the Bank for International Settlements. This sets a framework on how banks and depository institutions must calculate their capital. In 1988, the Committee decided to introduce a capital measurement system commonly referred to as Basel I. In June 2004 this framework was replaced by a

significantly more complex capital adequacy framework commonly known as Basel II. Following the financial crisis of 2007–08, Basel II was replaced by Basel III, which will be gradually phased in between 2013 and 2019 (Basel III, 2008).

1.1.4 Effect of Credit Risk and Working Capital on Capital Adequacy

Banks represent the major part of the financial market. The importance of banks stems from the role of the banks in managing risks, increasing liquidity between lenders and borrowers, decreasing transaction costs and facilitating development of businesses (Basel, 2010). Since the importance of the banking sector and its stability is beyond doubt, most authors claim that the collapse of a bank, in contrast to the bankruptcy of any other institution, has a huge impact upon the whole society. The history of banking is littered with bankruptcies and systemic bank collapses that caused, or were caused by, the economic decline of countries (Demirguc, 2009).

The role of banks has always been outstanding due to the complexity of the financial mechanism and the development of the economic system; therefore, societies have always been looking for ways to ensure an efficient, reliable and secure performance of banks. Bankruptcy of banks and the threat to the entire system are conditioned by the very essence of their operations, which have and are related to all types of risks. Solvency and liquidity risk management is a process that enables shareholders of the bank to maximise their profit without exceeding an acceptable risk. One of the most important objectives in banking operations is to choose the most appropriate ratio between the risk level and the profit rate (Jimenez, 2009).

In the banking sector, risk ordinarily means a threat that a bank may lose part of its resources, revenues, or suffer higher costs when performing certain financial operations. Assumption of a

risk in the banking business does not, however, always mean loss. Efficient management of capital adequacy and working capital at the bank may build a solid basis for a successful business. Garbanov (2010) describes efficient risk management as one of the methods enhancing a bank's competitiveness, decreasing its financial costs and increasing the worth of the bank. In the banking business, risk management does not mean the full elimination of risk from the operations of the bank; complete elimination of risk not being feasible does not mean that banks can do nothing and reconcile to the damage caused by risk as if it were inevitable. Therefore, the objective that any bank defines is a proper risk management. This puts banks on a level playing field to compete among themselves while properly managing the risk.

According to Basel (2010) regulation of banks aims at increasing the safety of the banking sector. One of the most important instruments is a capital adequacy regulation which relates a bank's equity to its exposure to risk on the asset side of the balance sheet. In this paper we used an industrial organization approach to model a large risk neutral bank in order to investigate consequences of this kind of regulation. We found that a capital adequacy regulation of the type included both in the existing Basel Capital Accord and in the proposed New Basel Capital Accord induces a risk neutral bank to behave as if it were risk averse. This is caused by an income effect from linking the bank's exposure to risk to the equity capital required for performing banking activities. The only necessary condition for this mechanism to work is that holding and extending equity is more costly than the risk free interest rate in the (interbank) capital market (Basel, 2010).

Furthermore it was shown that because of this effect of capital adequacy regulation there exists an incentive for banks to engage in active risk management, i.e., hedging, if regulatory rules accept such hedging operations as risk reducing which part of the proposal of the New Basel

Capital Accord (Basel, 2010). In this case the banks fully hedge their exposure to risk and can separate decisions on interest rates from hedging decisions.

1.1.5 Commercial Banks in Kenya

The history of Commercial Banks in Kenya dates back to 1896 when the KCB's predecessor, the National Bank of India opened an outlet in Zanzibar. Eight years later in 1904, the bank extended its operations to Nairobi, which had become the headquarters of the expanding railway line to Uganda (Cornett, 2004).

In 1986, Kenya's financial sector experienced a crisis that resulted in 37 failed banks. Loans in default were at the centre of the financial crisis. To protect Kenya's commercial banks from undergoing a similar crisis, the Parliament passed a series of regulations to govern the banking industry, and the Central Bank of Kenya strengthened its regulatory role. The Banking Act was amended in 1999, and installed a capital requirement (a minimum amount of liquidity available at all times) at commercial banks. Risk assessment and credit rating agencies were also created in Kenya to govern the distribution of loans (Ongeri, 2013).

Kenya currently has 43 licensed commercial banks and one mortgage finance company. Of these 44 institutions, 31 are locally owned and 13 are foreign owned. Citibank, Habib Bank and Barclays Bank are among the foreign-owned financial institutions in Kenya. The government of Kenya has a substantial stake in three of Kenya's commercial banks. The remaining local commercial banks are largely family owned. Commercial banks in Kenya accept deposits from individuals and turn a profit by using the deposits to offer loans to businesses with a high interest rate (Amihud, 2013).

1.2 Research Problem

Banks act as financial intermediaries accepting money on deposit, which can be withdrawn on demand or at very short notice, and then lending it out. Banks act as links between savers and borrowers accepting deposits, paying interest on them and making loans and charging borrowers a higher interest rate. In order for banks to acquire deposits, depositors must have confidence in banks and in the banking system (Cornett, 2004).

Given their importance in the economy, commercial banks are heavily regulated. One of the areas of regulations is with respect to capital adequacy. Minimum capital requirements have the aim of preventing bank collapse (Eaknis, 1997). During the 1980s, the banking sector grew rapidly in terms of the number of institutions and the range of services offered, leading to claims that Kenya was over-banked. The rapid expansion of this sector was accompanied by various weaknesses which included limited liquidity, non-performing loans and capital inadequacy. Between 1984 and 1986 there was a major disruption when several local banks failed mainly due to inability to meet statutory requirements and maturity obligations. In 1989, the government merged one bank and nine non-banking financial institutions to form Consolidated Bank in order to stop their collapse (Mullei, 2006).

Between 1984 and 1998 30 financial institutions had collapsed. According to CBK, one principal cause of this was structural weakness of the affected banks, with the most significant contributing factor being under-capitalization, which reduced these banks' cushion against losses and weakened their ability to survive a run on their deposits. Steps taken to stop further erosion of confidence in the banking system include: increased minimum capital requirements, government divestiture from the banking system (Mullei, 2006). As they have done selling their shares to members of the public in such institutions as KCB and Housing Finance, encouraging

small banks to merge so as to enjoy economies of scale, tightening of bank regulations and improved supervision of the banking system. Recent development in the Kenyan banking industry has been the emergence of Islamic/Sharia compliant banking (KCB, 2003). CBK (2013) with the entry of two banks, Gulf African Bank and First community Bank, this new concept is expected to tap into the large unbanked Muslim population (Demirguc, 2009).

Banks are crucial and it is therefore important to ensure proper functioning. The banking industry is constantly changing, this makes it important to keep a keen eye on changes and their effect on the public and economy. Therefore, a look into the risks faced by banks and the measures taken to reduce these risks to retain confidence in the banking system should be continuous. This research focused on credit risk and working capital and the effect on capital adequacy taking into account the size of the bank. Findings showed that there are other variables that affect capital adequacy of banks.

1.3. Objectives of the Study

The objective of this study was to determine the effect of credit risk and working capital on capital adequacy of commercial banks in Kenya.

1.4 Value of the Study

Policy makers and regulators would find this study important in formulation of policies on capital requirements for commercial bank in Kenya, that is, effort in designing new capital requirement that would provide banks with sufficient reserves to withstand future crises.

Each commercial bank faces risks at different levels, this study would assist banks evaluate and determine on an individual capacity the risk it faces and how to best guard against credit and liquidity risk.

The research would benefit both current and potential investors in the industry, to make informed investment decisions. The study would add to the body of knowledge on the bank system which may be important for students, scholars and other academicians. The implications for effects of credit and liquidity risk on commercial banks may be substantial and deserve further research. Therefore the study would give a way for further studies on this topic.

This study contributes to the existing literature in several ways. First, it would show how to account for the interaction between liquidity risk and credit risk within Basel III's incremental risk capital charge (IRC). Second, we estimated the sensitivity of credit, liquidity and market risk in trading portfolios to several risk dimensions, including credit rating, credit rating method (point-in-time or through-the-cycle), maturity and banking sector.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter involves the systematic identification, location and analysis of documents containing data to be used to analyze the determinants of capital structures for commercial banks in Kenya. It contains examinations of what other writers have said, written and done in this field. It was aimed at obtaining detailed knowledge of problems being investigated by providing the general guidelines and procedures followed to carry out and scrutinize the research.

2.2. Theoretical Review

Theoretical literature review starts by discussing the various theories that tend to shape the thinking of the societies towards particular needs, events in the near future.

2.2.1. Agency Theory

Agency theory originated from the work of Adolf Augustus Berle and Gardiner Coit Means, two American economists who began discussing corporate governance in terms of an “agent” and a “principal” as early as 1932. Berle and Means explored the concepts of agency and their applications toward the development of large corporations and they saw how the interests of the directors and managers of a given firm differed from those of the owner. They used the concepts of agency and principal to explain the origins of those conflicts (Means, 1932).

Two more American economists, Michael Jensen and William Meckling, further refined shaped the work of Berle and Means in the context of risk-sharing research, and most scholars credit these two with the actual coining of the formalized “agency theory.” Jensen and Meckling formed a school of thought arguing that corporations are structured to minimize the costs of getting agents to follow the direction and interests of the principals (Means, 2009).

Agency theory is an economic concept that explains why behavior or decisions vary between members of a group (Pendergast, 1999). It can apply to almost any particular “set” of people who spend some or all of their time in similar situations, from school classes and local communities to industry groups and religious sects. Most of the time it is discussed in terms of business, though, and it emerged as a principle of corporate economics. The theory describes the relationship between one parties, called the principal, who delegates work to another, called the agent. It explains their differences in behavior or decisions by noting that the two parties often have different goals and, independent of their respective goals, may have different attitudes toward risk. Analysts often rely on this theory in order to make predictions about how teams will function and the degree of success certain people-led ventures are likely to obtain (Szuchman, 2013).

The theory essentially sets out how different parties involved in the same situation with the same goal will often have different motivations, and it goes on to look at how these different motivations can sometimes lead to widely varying results. It states that there will always be partial goal conflict among parties, and argues that efficiency is inseparable from effectiveness. In addition, it posits that information will always be somewhat asymmetric between principal and agent. According to Berle, (1932) agency theory suggests that the firm can be viewed as a nexus of contracts between resource holders. An agency relationship arises when ever one or

more individuals-principals, hire one or more other individuals-agents, to perform some service and then delegate decision-making authority to the agents. The primary agency relationships in business are those between stockholders and managers and between debt holders and stockholders. These relationships are not necessarily harmonious; indeed, agency theory is concerned with so-called agency conflicts, or conflicts of interest between agents and principals. This has implications for, among other things, corporate governance and business ethics. When agency occurs it also tends to give rise to agency costs, which are expenses incurred in order to sustain an effective agency relationship (Means, 1932).

Different agents have different preference for capital as well as uses. Stockholders prefer greater financial leverage, that is, greater capital risk and this creates a moral hazard problem for deposit insurers (Berg, 2010). Basically, stockholders use the funds of depositors and other debt-holders to generate higher returns for them on a smaller investment. From a current stockholder's perspective, retained earnings and increasing equity capital permits a commercial bank to grow and acquire other banks without having to issue external equity, which can be expensive and dilute current stockholders' earnings, (Demirguc, 2009). According to Gardner and Mills (2009), it also prevents greater regulatory interference concerning merger or branching decisions. Using capital to finance additional fixed assets or additional growth is also less risky than financing long-term assets with short-term deposits. Studies by McAleer (2009) also show that well capitalized banks have a lower cost of uninsured funds and a lower weighted average cost of capital as well as generating higher return on equity. In contrast to stockholders, uninsured creditors prefer higher capital ratios as a cushion against potential losses to protect against loss of funds they lent to the banks. Managers fear losing their jobs if their institutions fail and so may generally prefer higher capital ratios as a cushion against loss, (McAleer, 2009).

Regulators prefer greater capital to protect deposit insurance funds and tax payers' money. Also because capital promotes confidence, it is more likely that depositors will not remove deposits all at once from a bank in case of difficulties. The more capital, the more protection is afforded to uninsured depositors and other short-term creditors, this in turn makes a run on the institution less likely. If an institution is not well capitalized, regulators are more likely to interfere in plans for acquisition or additional branches (Cornett, 2004).

2.2.2 Liquidity Preference Theory

Liquidity preference refers to the demand for money, considered as liquidity. The concept was first developed by John Maynard Keynes in his book *The General Theory of Employment, Interest and Money* (1936) to explain determination of the interest rate by the supply and demand for money. The demand for money as an asset was theorized to depend on the interest foregone by not holding bonds (here, the term "bonds" can be understood to also represent stocks and other less liquid assets in general, as well as government bonds). Interest rates, he argues, cannot be a reward for saving as such because, if a person hoards his savings in cash, keeping it under his mattress say, he will receive no interest, although he has nevertheless refrained from consuming all his current income. Instead of a reward for saving, interest, in the Keynesian analysis, is a reward for parting with liquidity (Panico, 2008).

According to Keynes, demand for liquidity is determined by three motives: the transactions motive: people prefer to have liquidity to assure basic transactions, for their income is not constantly available. The amount of liquidity demanded is determined by the level of income: the higher the income, the more money demanded for carrying out increased spending; the

precautionary motive: people prefer to have liquidity in the case of social unexpected problems that need unusual costs. The amount of money demanded for this purpose increases as income increases; speculative motive: people retain liquidity to speculate that bond prices will fall. When the interest rate decreases people demand more money to hold until the interest rate increases, which would drive down the price of an existing bond to keep its yield in line with the interest rate. Thus, the lower the interest rate, the more money demanded and vice versa (Rothbard, 2008).

In *Man, Economy, and State* (1962), Murray Rothbard (2008) argues that the liquidity preference theory of interest suffers from a fallacy of mutual determination. Keynes alleges that the rate of interest is determined by liquidity preference. In practice, however, Keynes treats the rate of interest as determining liquidity preference. Rothbard states the Keynesians therefore treat the rate of interest, not as they believe they do as determined by liquidity preference but rather as some sort of mysterious and unexplained force imposing itself on the other elements of the economic system (Rothbard, 2008)

2.2.3 Risk Theory

The theoretical foundation of risk theory, known as the Cramér–Lundberg model (or classical compound-Poisson risk model, classical risk process or Poisson risk process) was introduced in 1903 by the Swedish actuary Filip Lundberg. Lundberg's work was republished in the 1930s by Harald Cramér (Lundberg, 1948).

Modern life is characterized by risks of different kind: some threatening all persons and some restricted to the owners of property, motor cars, etc., while still others are typical for some individuals or for special occupations (Lundberg, 1948). The corresponding accidents, losses or

claims will occur suddenly and unexpectedly and may involve considerable financial loss. It is quite evident that modern life is a fit subject for risk theory, and that some results in the pure mathematic theory might have applications in the study of problems in real life (Williams, 1948). According to Piper (1933) risk theory is identified with insurance risk theory or with the application of the theory of probability on insurance risk problems. This general definition has the advantage, that it covers a wide field of different risks and risk problems as specified in the insurance texts and a great collection of risk situations claims occurred (with corresponding loss amounts) is available in the claims acts. In fact, it is believed that any actuary or mathematician, starting his researches in risk theory or in risk statistics, should begin his studies by a series of actual claims acts (Lukas, 1967).

2.3 Determinants of Capital Adequacy for Banks

The determinants of capital adequacy for banks are usually taken to mean the available capital held by the banks for its smooth operation. Capital adequacy influences the bank performances which enhances its profitability (Aburime, 2005). However, Modigliani and Miller (1958) in their study indicated that perfect financial markets, capital structure and capital regulation is irrelevant due to hindrance to flexibility in the financial market. On his part, Mathuva, (2009) analyzes factors determining adequacy of capital in commercial banks and found that asset size, growth, and profitability are the key determinants of capital adequacy. Therefore capital adequacy is a function of size and growth factors which vary in their influence according to growth conditions and policies affecting structure.

Myers (1984) examined different capital adequacy theories. He found that drivers of firms' decisions to choose debt, equity or hybrid securities are still unknown. The findings in Myers's article challenged researchers to explore this puzzle further. Chonde (2003) revisited this puzzle

and find that “debt ratios provide an inappropriate framework for empirically examining the trade-off theory of capital adequacy”. In particular, they explained that debt (or debt to- equity) ratios are misguided and lead to poor and inconsistent results when examining the determinants of corporate capital adequacy. Gonzalez, and Gonzalez, (2008) revisited the capital-adequacy studies and concluded that different capital adequacy lead to different and diametrically opposed decisions and outcomes.

The nature of the economy, the environment provided by government, and the nature of the banking system also affects capital adequacy. In his study Ganesan, (2007), show that too tight a capital regulation lead banks to reduce their credit offer and, as a result, give rise to a fall in productive investment. They argue that, from society’s viewpoint, the optimal level of capital for the banking system should be determined by the point at which the marginal public returns to bank capital. Under some legal and political structures, however, regulators may not consider the social costs and, therefore, will require more capital in the system than society may desire. Glyn, (2013) explained the dramatic decline in capital to asset ratio in U.S commercial banks during the last two decades. He hypothesized that the rise in nominal interest rates might have contributed to the fall in capital ratios, time series-cross section estimation supports the hypothesis regarding the interest rate.

Olweny, and Shipho, (2011) utilized a unique comprehensive dataset, drawn from the 1999 baseline survey of some 2000 micro and small-scale enterprises (MSEs) in Kenya to analyse the financing behaviour of these enterprises within the framework of a heterodox model of debt-equity and gearing decisions. The study found that measures of the tangibility of the owner's

assets, and the owner's education and training had a significant positive impact on the probability of borrowing and of the gearing level.

Kuria (2010) using a panel of listed firms in Ghana, Kenya, Nigeria, South Africa and Zimbabwe investigated corporate capital structure in Africa, with emphasis on the extent to which firm characteristics and cross-country institutional differences determine the way firms raise capital. Results supported the pecking-order postulate. Firms' profitability, size, asset tangibility and age, related significantly to leverage; thus suggesting that remedies for inadequate institutional infrastructures were important determinants of corporate capital structure in Africa.

2.4 Empirical Review

Central banks implement monetary policy by steering short-term market interest rates around a target level. They do this essentially by controlling the supply of liquidity, i.e. the deposits held by banks with the central bank, mostly by means of open market operations. Specifically, major central banks carry out open market operations in which their working capital is provided on a temporary basis. In the case of the Euro system, an amount of around €400 billion was provided in the last quarter of 2005, mostly through operations with a one-week maturity (Bindseil, 2004)

In theory, these temporary operations could take the form of short-term loans to banks, offered via a tender procedure. It is, however, one of the oldest and least disputed principles that a central bank should not, under any circumstances (Rochet, 1997), provide unsecured credit to banks. This principle is enshrined, in the case of the Euro system, in Article 18.1 of the Statute of the European System of Central Banks and of the European Central Bank (hereafter referred to as the ESCB/ECB Statute), which prescribes that any Euro system credit operation needs to be

“based on adequate collateral”. There are various reasons why central banks should not provide uncollateralised lending, namely. Their function, and area of expertise, is to implement monetary policy to achieve price stability, not to be credit risk managers; Access to central bank credit should be based on the principles of transparency and equal treatment (Bindseil, 2004).

Unsecured lending is a risky art, requiring discretion, which is neither compatible with these principles nor with the accountability of the central bank (Dunn, 2006). Central banks need to act quickly in monetary policy operations and, exceptionally, also in operations aiming at maintaining financial stability. Unsecured lending would require careful and time-consuming analysis and limit setting (Berg, 2010).

A central bank can hardly stop transacting with a counter party because its limit has been exhausted. Such an action may be interpreted as a sign of deterioration of that counterparty’s credit quality, resulting in its inability to get working capital from the market, with potential financial stability consequences (Israel, 2001). To reflect the different degrees of counterparty risk in unsecured lending, banks charge different interest rates. By contrast, central banks have to apply uniform policy rates and thus cannot compensate the different degrees of risk. The principle that all temporary operations. Supplying liquidity need to be secured with collateral implies that they have two legs: one in central bank deposits and one in collateral. While the cash leg obviously has a decisive influence on the market for deposits, it is less recognised that the collateral leg also has an influence on the market for the underlying asset (Carey, 2001).

The explicit representation of bank balance sheets including a variety of financial assets and bank capital facilitates the examination of changes in capital and working capital requirements. Credit market frictions are introduced using a collateral constraints framework in which the balance sheet positions of households and businesses constrain their access to bank intermediated credit (Dunn, 2006). Besides financial frictions, the model exhibits a standard array of nominal and real frictions, such as habit persistence and price stickiness. The model is calibrated in two versions to represent the United States and EA economies. Banks provide financial intermediation services, taking deposits from some households and lending to other households as well as to nonfinancial firms (Mullei, 2006). Lending to the private sector includes household consumer and mortgage loans, as well as loans to entrepreneurs to finance production and capital investment. Households need to secure or collateralize their borrowing with durable assets housing; while borrowing by non-financial firms is secured against their physical capital assets. The maturity structure of deposits and loans is exogenous and calibrated to reflect the observed degree of flexibility in retail interest rates in the United States and EA. In addition to loans to the private sector, banks hold highly liquid, risk-free government securities in order to meet working capital requirements (Carey, 2001).

Regulatory requirements with respect to capital and working capital impose constraints on the behaviour of banks and constitute the third main element shaping the transmission mechanism. To represent the pressure on banks to meet capital requirements, but with some ability to tolerate relatively small deviations from the target ratio, we employ a quadratic penalty function that lowers the bank's revenue in response to deviations (above or below) of the actual capital ratio from the required ratio (Lukas, 1967). For example, in the event of a negative shock to capital

relative to the target, (through a fall in capital or a rise in required capital), the penalty cost of deviating from the regulatory requirement creates an incentive to raise capital (Cornett, 2004).

Bank capital requirements together with equity market imperfections (a constant dividend payout ratio) bring the bank capital channel into the model (Rochet, 1997). This channel alters the transmission of policy interest rates if banks face a negative shock to their capital. In this event banks seek to accumulate additional capital and hence exercise an influence on interest rate spreads and credit availability independent of monetary policy. A similar mechanism is introduced through working capital requirements, since changes in the target liquidity ratio affect bank profits and, consequently, interest rate spreads (Panico, 2008).

Market risk is the risk of losses in positions arising from movements in market prices. All businesses take risks based on two factors: the probability an adverse circumstance will come about and the cost of such adverse circumstance. Risk management is the study of how to control risks and balance the possibility of gains (Berg, 2010). As with other forms of risk, the potential loss amount due to market risk may be measured in a number of ways or conventions. Traditionally, one convention is to use value at risk (VaR). The conventions of using VaR are well established and accepted in the short-term risk management practice (Williams, 1948). However, VaR contains a number of limiting assumptions that constrain its accuracy. The first assumption is that the composition of the portfolio measured remains unchanged over the specified period. Over short time horizons, this limiting assumption is often regarded as reasonable. However, over longer time horizons, many of the positions in the portfolio may have been changed. The VaR of the unchanged portfolio is no longer relevant (Eaknis, 1997).

The Variance Covariance and Historical Simulation approach to calculating VaR also assumes that historical correlations are stable and will not change in the future or breakdown under times of market stress (Dunn, 2006). In addition, care has to be taken regarding the intervening cash flow, embedded options, changes in floating rate interest rates of the financial positions in the portfolio. They cannot be ignored if their impact can be large (Pendergast, 1999).

2.5 Summary of Literature Review

Capital became very crucial for financial institutions in the 1990s. In response to the large number of bank failures new capital requirements were instituted for commercial banks and thus many undercapitalized institutions had to raise capital or be acquired or merge with other banks. In the late 1990s capital became increasingly important to allow financial institutions among them commercial banks to acquire other commercial banks to become major players nationally or internationally. For Asian banks that suffered large losses in the late 1990s, having sufficient capital to absorb losses became critical for survival (Carey, 2001). How much capital is adequate for commercial banks depends on a combination of risk profile, regulatory requirements and other practical considerations. Economic risk is the risk of a bank shaving significant losses. The amount of capital a bank needs to hold depends on its credit risk, market risk, business risk and targeted equivalent bond rating.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter illustrates the methods and procedures that were employed in the study in order to come up with the solutions to the research problem/objectives. It clearly described the research design, the target population and sampling design, data collection methods, as well as the methods to be used in analyzing the data and presentation.

3.2 Research Design

The study employed a descriptive research design. This design is a scientific method which involves observing and describing the character of each unit in the population. According to Shields, Patricia and Hassan (2006), descriptive research describes data and characteristics about the population/ phenomenon being studied. It aimed at investigating a question without attempting to quantifiably measure variables or look to potential relationships between variables. Descriptive research design was therefore employed to study the determinants of capital requirements for commercial banks in Kenya.

3.3 Research Population

Population according to Mugenda and Mugenda (2003) is the set of all the entities concerning which statistical inference are to be drawn. It is a complete enumeration of all the units in a sampling frame from which the research is to be conducted. The study therefore targeted a population of all the 43 commercial banks in Kenya.

3.4 Data Collection

The study utilized secondary data to answer the research questions. Secondary data were obtained from secondary sources to maximize on accuracy. Financial statements and reports of commercial banks which were audited were used to ensure that information was as accurate as possible. Data collected was in areas of; credit risk and working capital (liquidity) and bank size taking into account the total asset base of the bank which were the independent variables while capital structure as the dependent variable was also collected.

3.6 Data Analysis

The data collected was analyzed using descriptive statistics, correlations, and linear regression analysis. In addition to the comparative analysis of the capital adequacy, the study presented an analysis of the overall capital adequacy with respect to identified variables. Statistical Package for Social Scientists (SPSS) version 21 software package was used as a tool to help analyze the data.

3.6.1 Analytical Model

$$Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon$$

Where

Y : Capital Adequacy, measured by capital held by the bank.

α : A constant,

ε : Error Term,

x_1 : Credit Risk, measured by total loans advanced.

x_2 : Working Capital, measured using the liquidity gap (difference between current assets and current liabilities).

x_3 : Banks Size, measured by Total asset base held by the bank.

The variables x_1 , x_2 and x_3 are the independent variables which influence Capital Structure, Y, and the coefficient estimates β_1 , β_2 , and β_3 measure the impact of each variable on the capital adequacy for commercial banks.

The equation was tested for reliability through correlation analysis and forecasting purpose. Goodness of fit test was applied through the use of coefficient of determination (r^2) as a method to determine the reliability of all independent variables together with gradient. A coefficient of determination of $r^2 = 1$ perfectly reliable, $r^2 > 0.5$ highly reliable, $r^2 < 0.5$ fairly reliable.

3.7 Data Validity and Reliability

Validity is concerned with whether the findings are really about what they appear to be about, while reliability refers to the extent to which data collection techniques or analysis procedures will yield consistent findings, (Mugenda and Mugenda, 2003). This research used information from audited financial reports of all 43 commercial banks in Kenya.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND PRESENTATION

4.1 Introduction

The chapter presents the analysis part of the study. The analysis is based on the research objective the objective is tackled according to the analysis techniques designed in the methodology. Data collected was analyzed and the findings are as presented in this chapter inform of tables and narration/ discussion of the results.

4.2 Capital Adequacy for Commercial Banks

Table 4.1 presents the descriptive analysis of the variables of the study. The data collected on the capital adequacy of the banking sector measured by capital assets which as per the study depends on the credit risk, liquidity risk and bank size measured in terms of the total assets held by the bank was analyzed to give the mean values for the entire period under study as well as their standard deviations.

Table 4.1 Descriptive Statistics of the Study Variables

	Mean	Std. Deviation
Capital adequacy	0.2587	.02561
Credit Risk	0.8970	2.1122
Liquidity Risk	228.521	2.681
Bank size	0.2355	0.0271

According to the study results in table 4.1, the average capital adequacy was obtained to be 0.2587 (25.87%) with a standard deviation of 0.02561. this shows that for the entire period studied, the banks' capital adequacy can be summarized as 25.87% as the standard deviation value obtained was very small indicating a small deviation of the individual values. Also, the table indicates that, the capital risk, liquidity and bank size were summarized to be 0.8970, 228.521 and 0.2355 respectively. The standard deviations for all the factors above indicate small variations of the individual yearly data values from the mean value. Thus, these values can be relied as representatives of the financial adequacy of the commercial banks.

4.3 Correlation Analysis

In this study, the Pearson r statistic is used to calculate bivariate correlations. Values between 0 and 0.3 (0 and -0.3) indicate no correlation (variables not associated), 0.3 and 0.5 (-0.3 and -0.5) a weak positive (negative) linear association, Values between 0.5 and 0.7 (-0.5 and -0.7) indicate a moderate positive (negative) linear association and Values between 0.7 and 1.0 (-0.7 and -1.0) indicate a strong positive (negative) linear association. The significance of the relationship is

tested at 95% level with a 2-tailed test where a statistically significant correlation is indicated by a probability value of less than 0.025. This means that the probability of obtaining such a correlation coefficient by chance is less than 2.5 times out of 100, so the result indicates the presence of an association.

4.3.1 Correlation between capital adequacy and credit risks

Correlation analysis results for the association between the banks' capital adequacy and the value of capital risk is presented in table 4.2. It gives the Pearson's coefficient value (correlation test) and the significance value (measuring significance of the association).

Table 4.2 Correlation between capital adequacy and credit risks

		credit risks
capital adequacy	Pearson Correlation	.911
	Sig. (2-tailed)	.002
	N	43

From the table 4.2, the Pearson correlation value was obtained to be 0.911. This is a coefficient value in the interval 0.7 to 1.0 which indicates that the variables have a strong correlation value which is as well positive. Testing the significance of the association at 5% level with a 2-tailed test, the association has a significant value of 0.002. This value is less than the critical value at 5% level (0.025, 2-tailed). This therefore confirms the significance of the association between the two variables. The results therefore suggest that there is a strong positive correlation between capital adequacy and the value of credit risk which is also statistically significant.

4.3.2 Correlation between Capital Adequacy and the Liquidity Gap

The analysis of correlation aimed at testing the association between the banks' capital adequacy and the value of liquidity risk was conducted and tested for its significance at 5% level. The results are as presented in table 4.3.

Table 4.3 Correlation between capital adequacy and the liquidity risk

		Liquidity risk
capital adequacy	Pearson Correlation	.861
	Sig. (2-tailed)	.005
	N	43

Based on the findings in the table, the capital adequacy of the banks and the value of liquidity ratio has a correlation coefficient of 0.861 which is a strong and positive correlation coefficient. Its significance tested at 5% level with a 2-tailed test indicated a significant value of 0.005 less than 0.025 (the critical value). Thus, the findings indicate that there is a strong positive association between capital adequacy and the value of liquidity ratio. This association was also proved to be statistically significant hence explaining the reliability of the association.

4.3.3 Correlation between Capital Adequacy and Bank Size

Table 4.4 below presents the correlation analysis results for the test of association between capital adequacy of banks and the size of the bank. It gives the correlation coefficient and the significance value of the association.

Table 4.4 Correlation between capital adequacy and bank size

		bank size
capital adequacy	Pearson Correlation	.802*
	Sig. (2-tailed)	.005
	N	43

The study results in the table indicate that, the banks' capital adequacy and the size of the bank have a correlation of 0.802. This according to the Pearson's correlation scale indicates a strong positive correlation. Its significant value is 0.005 as the table shows. This is also a value less than 0.025 at 5% level thus revealing that the association is statistically significant. The results therefore show that there is a strong and positive correlation between capital adequacy of commercial banks in Kenya and the size of the bank.

4.4 Regression Analysis

The objective of this study was to establish the effect of credit and liquidity risk on capital adequacy for the commercial banks in Kenya. To accomplish this, the study conducted a regression analysis which gives the relationship between the measures of independent variables (liquidity risk, credit risk and the size of the bank) and capital adequacy measured by capital assets.

4.4.1 Model Summary

Table 4.5 gives the regression model summary results. It presents the R value which is the measure of association between the dependent and the independent variables, the R Square which is the coefficient of determination measuring the extent at which the independent variables influence the dependent variable as well as the Adjusted R Square which measures the reliability of the regression results.

Table 4.5 Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.921 ^a	.848	.823	.00182

a. Predictors: (Constant), credit risk, liquidity risk, bank size

According to the results in table 4.5, there is a strong and positive association between the dependent variable (capital adequacy) and the independent variables (credit risk, liquidity risk, bank size). This is as given by the R value of 0.921 revealing the strength of the association. The coefficient of determination (R Square) in the table is 0.848. This value explains that, holding other factors (not mentioned in the study) constant, the value of the credit risk, liquidity risk, bank size contributes to 84.8% of the variance in the capital adequacy of the commercial banks while the other factors accounting for 17.7% of the variability (1-0.823).

The variation due to the studied variables (92.1%) is very high and therefore can be relied on to explain the changes in the capital adequacy of the commercial banks in Kenya. The results obtained are also reliable as given by the Adjusted R Square value of 0.823 which explains that

the study results are 82.2% reliable and therefore the regression model developed can be relied on to explain the trends in the capital adequacy of the commercial banks.

4.4.2 Regression Coefficients

In order to answer the proposed model for the relationship between capital adequacy of commercial banks and the independent variables, the regression coefficients were calculated and presented in table 4.6. These with their significance values (also given in the table) measures the influence of each independent variable to the capital adequacy of the banks (dependent variable) and the effect that would occur to the financial performance in an attempt to changing (increasing/decreasing) these variables.

Table 4.6 Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.117	.022		1.076	.002
	Credit risk,	3.125	.044	.577	1.801	.030
	Liquidity risk	0.421	.001	2.241	1.490	.004
	Bank size	6.251	.014	1.830	1.199	.013

a. Dependent Variable: Capital adequacy

The regression test results presented in the table indicate that, all the coefficients are positive and are also significant as given by their p-values (sig. values) which are all less than 0.025 testing at

5% level with a 2-tailed test. Thus, with these values being less than the critical value at 5% level, the coefficients are statistically significant and explain significant influence of the independent variables to the capital adequacy of the banks.

These coefficients therefore are used to answer the following regression model which relates the predictor variables (independent variables) and the dependent variables;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Y : Capital Adequacy, measured by capital held by the bank.

α : A constant,

ϵ : Error Term,

x₁: Credit Risk, measured by amount of loans advanced.

x₂: Working capital, measured using the liquidity gap (difference between current assets and current liabilities).

x₃: Banks Size, measured by Total asset base held by the bank.

Based on these coefficients, the regression model therefore becomes;

$$Y = 0.117 + 3.125 X_1 + 0.421 X_2 + 6.251 X_3$$

Thus, the model indicates that, holding the predictor variables constant, the capital adequacy of commercial banks would be 0.117. This explains that, without the influence of the value of credit risk, working capital and the bank size, the capital adequacy value of the commercial banks would be 0.117. Also, the model shows that, a unit increase in the credit risk results to 3.125 times increase in the banks' capital adequacy. Thus the two variables are positively related with a magnitude of 3.125 explaining the extent of influence to the dependent variable.

From the model developed also, it is clear that a unit change in the value of liquidity risk will lead to a 0.421 times direct changes in the banks' capital adequacy. This indicates that, the value of liquidity risk and the capital adequacy of the commercial banks are positively related where increasing the value of liquidity risk will give a corresponding increase of 0.421 times to the capital adequacy.

Further, the model indicates that, the coefficient of the value of bank size and the capital adequacy of the commercial banks is 6.251. This reveals that, given a unit increase in the value of the bank size, the capital adequacy of the commercial banks will be affected by 6.251 times increase consequently. Thus, the two variables are positively related.

4.5 Test of Significance

The significance of the relationship between the dependent and the independent variables in this study was tested at 5% confidence level using a chi-square test. The critical significance value at this level was set at 0.025 in a 2-tailed test. Thus, with a significant value below this value (0.025), the results reveal the significance of the relationship. The chi-square test results for the significance of the relationship between capital adequacy and the independent variables are as presented in table 4.7

Table 4.7 Chi-Square Test for the Relationship between the Variables

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.120 ^a	84	.021
Likelihood Ratio	11.012	84	.001
Linear-by-Linear Association	3.471	1	.006
N of Valid Cases	43		

Based on the table results, the significance test results indicate a Pearson chi-square value of 22.120 with 84 degrees of freedom at 5% confidence level. The significance value is 0.021 which is less than the critical value (0.025) in a 2-tailed test. Thus, based on these results there is a statistically significant relationship between the capital adequacy of the commercial banks and the liquidity and credit risks of the commercial banks.

4.6 Summary and Interpretations of Findings

The findings also revealed that, the value of liquidity risks and the capital adequacy of the commercial banks are positively related where increasing the value of liquidity risk will give a corresponding increase in the capital adequacy. This is in line with the study of Carey (2001) who indicated that banks hold highly liquid, risk-free government securities in order to meet liquidity requirements that in turn enhances their capital adequacy. The study has also established that given a unit increase in the value of the credit risk, the capital adequacy of the

commercial banks will be affected by increase as a result. Thus, the value of credit risk and the capital adequacy of the commercial banks are positively related. And as stated by Panico (2008), the availability of credit in the banks alters the transmission of policy interest rates if banks face a negative shock to their capital. In this event banks seek to accumulate additional capital and hence exercise an influence on interest rate spreads and credit availability independent of monetary policy. A similar mechanism is introduced through liquidity requirements, since changes in the target liquidity ratio affect bank profits and, consequently, interest rate spreads. This therefore enhances the capital adequacy of the banks and hence enhances their profitability.

The study also found out that, the banks' capital adequacy and the size of the bank have a strong and positive correlation as given by the Pearson correlation coefficient. The association was also found to be statistically significant at 5% level. This therefore shows that there is a strong and positive correlation between capital adequacy of commercial banks in Kenya and the size of the bank. In line with the study of Dunn (2006), the Variance Covariance and Historical Simulation approach to calculating VaR also assumes that historical correlations are stable and will not change in the future or breakdown under times of market stress unless the asset base of the bank remains steadily big enough to support its operations.

The study found that overall liquidity risks of banks are positively related to capital adequacy. Therefore having high liquidity risks cannot make the banks go bankrupt but enhance its operation effectively. It is found that bank size is positively and statistically related to capital adequacy. The result also shows that credit risk of banks is negatively related to banks' profitability, risk and asset structure and positively related to bank size, growth and therefore its

growth. This therefore means that the long-term debt of the banks is positively related to banks' asset structure and profitability.

On testing the linearity of the association, regression analysis was conducted. The study findings on this illustrated that, holding other factors constant, the value of the credit risk, liquidity risk and size of the bank (independent variables) determines 92.1% of the financial performance of the commercial banks. Only 7.9% of the capital adequacy has not been accounted for by the studied factors (independent variables). The study further found out that, without the influence of; the value of credit risks, the liquidity risk and the size of the bank, the capital adequacy would be 0.117. Also, findings indicated that, commercial bank's capital adequacy and size of the banks are positively related with a magnitude of 6.251 explaining the extent of influence to the dependent variable.

The findings also revealed that, the value of liquidity risks and the capital adequacy of the commercial banks are positively related where increasing the value of liquidity risk will give a corresponding increase of 0.421 times to the capital adequacy. The study has also established that given a unit increase in the value of the credit risk, the capital adequacy of the commercial banks will be affected by 3.125 times increase as a result. Thus, the value of credit risk and the capital adequacy of the commercial banks are positively related.

Generally, the findings of this study agree with the findings of the study conducted by Mathuva, (2009) on capital adequacy which illustrated that adequacy of the capital had statistically significant influence on the liquidity and credit risks of the bank and is essential in determining the profitability of the bank in the business.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Study

The aim of the study was to evaluate the effects of credit and liquidity risk on capital adequacy for commercial banks in Kenya. The capital adequacy as the dependent variable was measured by capital asset. The independent variables were credit risk which was measured by amount of loans advanced, liquidity risk measured by the liquidity gap (difference between current assets and current liabilities) and bank size which was measured in terms of the total assets held by the banks. The major analysis to answer this object was regression analysis. Correlation analysis was conducted to evaluate the association of the variables. Multiple regression analysis was also conducted to evaluate the linear relationship between the dependent and the independent variables. The significance of the association and relationships was tested at 5% confidence level with a 2-tailed test. Chi-square test was the main test statistics conducted to test the significance of the relationships.

In testing the association between the capital adequacy and independent variables, the Pearson correlation test was conducted for each independent variable and the dependent variable separately. For the value of credit risk and the capital adequacy, the Pearson correlation value was found to be positive and strong as indicated by the obtained value of 0.911. The association was also found to be statistically significant since the significant value supporting this association was 0.002 which is less than the critical value of 0.025 at 5% level with a 2-tailed test.

The study findings indicated that, the capital adequacy of the commercial banks and liquidity risk has positive and strong correlation which is also significant tested at 5% level. This is as indicated by the Pearson coefficient value of 0.861 which is a strong and positive correlation coefficient. Thus, the findings indicate that there is a strong positive association between capital adequacy and the liquidity risk.

The study also found out that, the banks' capital adequacy and the size of the bank have a strong and positive correlation as given by the Pearson correlation coefficient of 0.802. The association was also found to be statistically significant at 5% level. This therefore shows that there is a strong and positive correlation between capital adequacy of commercial banks in Kenya and the size of the bank.

These findings were in support of the findings of the study conducted by Dunn, (2006) who indicated that there is a direct relationship between capital adequacy and liquidity risk as well as capital risks.

5.2 Conclusion

This study examined the effects of credit and liquidity risk on capital adequacy for commercial banks in Kenya. Generally, the variables examined were consistent with the liquidity preference and risk theory. However, the inferences associated with this variable were significantly affected by the size of the bank. The study has also highlighted the importance of having a bigger asset base in which the bigger the asset base the higher the amount of capital adequacy. Given the relatively high proportion of short-term debt financing of banks in Kenya, and banks being a source of capital to other firms, overall credit risk is positively related to capital adequacy. In the

same line, the study found that liquidity risk is positively and statistically related to capital adequacy. This is intuitive both from theoretical and duration matching perspectives.

The study has accounted for the capital adequacy in the commercial banks in Kenya essential in determining their profitability. It has established that there is a direct relationship between capital adequacy and liquidity risk and capital risk as well as the size of the bank. The researcher therefore based on the findings presented in the above section makes conclusions regarding the effects of credit and liquidity risks on capital adequacy on the commercial banks in Kenya.

In general, the both credit and liquidity risk in banking sector influence the capital adequacy of commercial banks in Kenya positively. This has a significant effect on the profitability of the commercial banks which also influence their competitive advantage.

Results from the data collected discovered that credit risk of commercial banks had a positive and significant effect on capital adequacy of the banks. From these findings, it is evident that credit risk and liquidity risk significantly affect financial performance of the banking sector in Kenya. The findings confirm that an increase in the credit and liquidity risk results to increased capital adequacy.

In conclusion, the empirical evidence from this study suggests that credit risks, liquidity risk and bank size are important variables that influence banks' capital adequacy. These results are consistent with the theories developed in finance to explain capital adequacy within the firm.

5.3 Recommendations to Policy

From the findings of this research, the researcher recommends that due to the dynamics in the capital adequacy, the commercial banks should lend more to the customers in terms of the credit in order to enhance their the strategies leading to their increased profitability and financial effectiveness.

The study recommends that commercial banks in Kenya need to remain profitable by enhancing their asset base through expansion to major parts of towns in Kenya. As the results showed, higher profitability is positively related to high capital adequacy and higher asset base.

The commercial banks in Kenya should increase their innovative capability due to the business dynamics which enables firms to achieve a high level of competitiveness both in the national and international market. Thus, how to promote and sustain an improved innovation capability should be the key focus area of the top managers of the commercial banks as well of the regulatory agents of the sector in order to enhance capital adequacy.

The study also recommends that the commercial banks should create enabling environment for the employees to be innovative in their operations in order to take its competitive advantage through creation of innovative services (financial) leading to increased financial performance and growth of the sector hence capital adequacy.

5.5 Limitations of the Study

This study was conducted on commercial banks in Kenya. Banking systems are closely related to the economy of the country they're located in. This has the effect of restricting the relevance of findings to commercial banks in Kenya. Similarities to other economies may exist but findings may differ significantly.

Credit risk and liquidity risk exist in a vast number of businesses however the intensity differs from one industry to the other and also individual companies. Thus the results are therefore limited to commercial banks in Kenya and may not be generalized to other industries or sectors in Kenya.

The study focused on variables such as credit risks, liquidity risk and bank size as the determinants of capital adequacy of banks in Kenya. The results are therefore limited to the bank variables modeled in this study which are not the only factors affecting capital adequacy for commercial banks in Kenya.

The finds of the study show the effects as at December 2013, however with advances in ICT and everyday innovations resulting from competition, the situation could change drastically diminishing the relevance of the study.

5.5 Recommendation for Further Areas of Research

Since the study variables only account for 92.1% of the changes in the capital adequacy, it means that 7.9% of the banks' capital adequacy is determined by other factors. Therefore, a study should be done using different variables to determine their effect on capital adequacy. Some of the factors can be board of Directors composition, skills and qualifications of the staff, values of collateral used and automations of the operations.

Given the relevance of ICT and innovations, a study should be conducted into the role they play and how this is affecting commercial bank profitability. There is evidence of significant changes for banks resulting from this which is research worthy.

A study on the effect of the statutory minimum capital requirement on profitability might also be worth looking at. This will help determine if the requirements are appropriate as they are, or if this should be adjusted to ensure optimal performance of commercial banks.

There is an assumption that the banking systems is closely related to the economy of the country. This study therefore recommends that a study be done to replicate other sectors of the economy in Kenya to find out the effect of credit and liquidity risks on the capital adequacy of the firms and if indeed there is a positive correlation.

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APPENDIX 1: LIST OF COMMERCIAL BANKS IN KENYA

1. ABC Bank
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank Kenya
6. CfC Stanbic Holdings
7. Chase Bank Kenya
8. Citibank
9. Commercial Bank of Africa
10. Consolidated Bank of Kenya
11. Cooperative Bank of Kenya
12. Credit Bank
13. Development Bank of Kenya
14. Diamond Trust Bank
15. Dubai Bank Kenya
16. Ecobank Kenya
17. Equatorial Commercial Bank
18. Equity Bank
19. Family Bank
20. Fidelity Commercial Bank Limited
21. First Community Bank
22. Giro Commercial Bank

23. Guaranty Trust Bank Kenya
24. Guardian Bank
25. Gulf African Bank
26. Habib Bank
27. Habib Bank AG Zurich
28. Housing Finance Company of Kenya
29. I&M Bank
30. Imperial Bank Kenya
31. Jamii Bora Bank
32. Kenya Commercial Bank
33. K-Rep Bank
34. Middle East Bank Kenya
35. National Bank of Kenya
36. NIC Bank
37. Oriental Commercial Bank
38. Paramount Universal Bank
39. Prime Bank
40. Standard Chartered Kenya
41. Trans National Bank Kenya
42. United Bank for Africa
43. Victoria Commercial Bank