EFFECT OF BANK SPECIFIC FACTORS ON CAPITAL ADEQUACY OF COMMERCIAL BANKS IN KENYA

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DECLARATION

This research project is my original work and has not been submitted to any college, institution or university for any academic award other than the University of Nairobi.

Signed  **Date: August, 25th 2022**

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REG NO: D63/84130/2015

This research project has been presented for presentation with my approval as supervisor

Signed…  **Date: August, 25th 2022**

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DEDICATION

The research is dedicated to my family. A special feeling of gratitude to my wife, Wambui Mwangi whose words of encouragement and push for tenacity ring in my ears.

I dedicate this work and give special thanks to my daughters, Ivy and Emma for being there for me throughout the entire Masters program.

You have been my best cheerleaders and I thank you.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

AQ	:	Asset quality
CAMEL	:	Capital, asset quality, Management efficiency, earnings and Liquidity
CAR	:	Capital Adequacy Ratio
CBK	:	Central Bank of Kenya
EBTD	:	Earnings before tax and depreciation
FOSA	:	Front officer services
GDP	:	Gross domestic Product
LQ	:	Liquidity
MaQ	:	Management Quality
NII	:	Net Interest income
NPAs	:	Non-Performing Assets
NPLs	:	Non-Performing Loans
OLS	:	Ordinary least squares
PCSEs	:	Panel Correlated Standard errors
ROA	:	Return on assets
ROE	:	Return on Equity
SACCOs	:	Savings and credit cooperative Organizations
VIF	:	Variance Inflation Factor

ABBREVIATIONS AND ACRONYMS

ABSTRACT

The research evaluated the causal effect relationship between bank specific factors and capital adequacy of licensed commercial banks operating in Kenya. The research was based on suitability theory of liquidity, Information Asymmetry and Buffer capital theories. The research was based on descriptive survey design. The study targeted 43 commercial banks licensed to operate between 2016 and 2021. The research did not carry out sampling because of the small size of population hence it was a census. The research sourced annual secondary data spanning from 2016 to 2021 from audited financial statements of the banks. The collected data was recorded on data collection sheet. The data collected was keyed into Excel sheet and the variables were generated before being exported to STATA version that aided in generation of descriptive and inferential statistics. Regarding descriptive analysis, standard deviation, mean, minimum, maximum and standard deviation were adopted. Panel correlated standard errors (PCSEs) regression model was adopted in analysis to correct for serial correlation and heteroskedasticity problem. The regression analysis revealed that 59.1% of the variation in capital adequacy was explained by explanatory variables in the model. Moreover, the study revealed a statistically significant direct effect of return on assets management quality and bank liquidity on capital adequacy. Further, asset quality and bank size had a major inverse effect on capital. Overall, the research concluded that bank specific factors studied had a major effect on capital adequacy of CBK's licensed commercial banks. Given that ROA had direct and major causal effect relationship with capital adequacy, the study suggested to commercial banks' top executives to seek to increase their profitability via interest based and non-interest-based revenue sources. The CBK to continue tightening supervision of commercial banks to ensure the reported ROA in the audited financial statements reflect the true and fair view of the banks as regards the profitability. The study also suggests to executives of commercial banks to strengthen their liquidity position. The banks should have adequate liquidity to settle maturing obligations including fixed and demand deposits. Increasing liquidity in terms of cash and cash equivalents leads to increased credit worthiness and trust in the bank by customers and investors hence increased capital adequacy through attraction of more share capital to the bank. The CBK should also continue exercising close and stringent supervision of the commercial banks liquidity to ensure it is within acceptable level especially strong or satisfactory level. The study suggests to management of commercial banks ought not increase their assets size without proportionate increase in total capital. The bank should therefore increase their capital to match increase in assets size to avoid reduction in capital adequacy ratio. The study also suggests to management of commercial banks to improve their credit analysis and implement stringent loan application screening to weed out prospective loan defaulters. The CBK should also continue monitoring the quality of asset of commercial banks to ensure that the banking system does not suffer from widespread increasing loan losses.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Globally and locally in Kenya, banks play an important role as financial intermediaries for savers and borrowers. Empirical studies have revealed that to ensure a banking environment that is sustainable, it is critical that capital adequacy be evaluated together with key factors affecting it (Dao & Nguyen, 2020). The Capital adequacy of a bank or financial institution is explained by a number of predators often called the CAMEL model in the banking literature (Hassan, Unsal & Tamer, 2016). "The abbreviation CAMEL stands for Capital adequacy, asset quality, management efficiency, earnings, liquidity and sensitivity (Jiménez-Martín, McAleer & Pérez-Amaral, 2009)." Besides the CAMEL factors, capital adequacy is also predicted by factors such as firm size and Net Interest Income (Hasan et al., 2015).

Buffer capital theory was advanced by Calem and Rob (1996) to explain the behavior of banks nearing the statutory minimum capital ratio. The theory holds that banks whose capital level had fallen and is approaching the minimum set will often inject additional capital and lower their risks drivers (Dao & Nguyen, 2020). The theory informs the rationale for commercial banks holding more than minim capital requirements by the CBK. Information Asymmetry Theory developed from significant contribution from Akerlof (1970), Spence (1973) and Rothschild and Stiglitz (1976). Information asymmetry problems of adverse selection and moral hazard leads to rising non-performing loans and increasing loan losses. Increasing loan losses due to increasing non-performing loans erodes the capital of the banking institution (Nyamweya and Obuya, 2020). Shiftability theory was formally originated by Moulton (1918) to explain how banks exchange position between cash and cash equivalent financial assets depending on liquidity situation. The theory informs liquidity and how it related to capital adequacy. Banks that are liquid through having adequate financial assets stock it can shift in time of liquidity problems also tends to have adequate capital.

The banking sector in Kenya registered reduced performance in 2020 compared to 2019. Asset quality fell from 12.5% in 2019 to 14.5% at the end of 2020. Capital adequacy ratio measured by "Total Capital to Total Risk Weighted Assets ratio" rose to 19.0% in 2020 from 18.8% in 2019.

Further, the liquidity ratio was at 54.5% in December 2020 compared to 49.7% in December 2019. Regarding profitability, the Central Bank of Kenya (CBK) reported that profitability before tax declined significantly from Ksh.159.1 billion recorded in December 2019 to Ksh.112.1 billion registered in December 2020. These was a declined by 29.5% (CBK, 2020). The decline in profitability was occasioned by the tough operating environment attributed to external and internal shocks associated with COVID-19 (CBK,2020).

1.1.1 Bank Specific Factors

The bank specific factors are factors domiciled within individual banks hence commonly referred to as bank characteristics. The bank specific factors are based on the discretion of the bank executives and board of directors (Kassem & Sakr, 2018). Bank specific factors are aspects that uniquely distinguish banking organizations such as asset quality, liquidity, financial leverage, loan growth, profitability, firm size among others (Suppia & Arshad, 2019). Bank specific factors are not identical between banking organisations and may be influenced by different aspects depending on product and services offered by each bank (Bolgorian & Mayeli, 2019). Even though there are many banks specific factors, the current study will focus on asset quality, bank size, liquidity, profitability, net interest income and management quality (Ng'eno, 2017).

Asset quality captures the possibility of bank customers to default on part or all of the total loans as measured by proxies such as ratio of non-performing loans to total loans. The lower the ratio, the higher the quality of assets held by the banking institution (Kadioglu, Telceken & Ocal, 2017). The Assets quality associated with a bank act as an indicator of the level of credit risk the bank is exposed (Elsa, Utami & Nugroho, 2018). Another predictor of capital adequacy in commercial banks is liquidity. Liquidity is the stock and flow of cash and cash equivalents of an institution and is often measured using liquidity ratios such as current ratio, working capital ratio and quick ratio (Restrepo, Cardona-Sosa & Strahan, 2019). The ratio shows the capability and ability of the commercial bank to settle obligations when they fall due (Nersisyan & Dantas, 2017).

Profitability is another bank specific factor that is a critical in predicting capital adequacy. Profitability measures the ability of the firm to utilise its stock of assets to generate revenues on a regular basis (Bitar, Pukthuanthong & Walker, 2018). Thus, profitability is critical to sustainability and long-term growth of a bank as well as the level of capital adequacy of the institution (Kimathi & Mungai, 2018). The profitability is often captured by proxies such as ROA and return on equity

(ROE). The interest income of the banking institution is another critical bank specific predictor of capital adequacy. Interest income of a bank comprises income from fixed income assets such as bonds and bills as well as loan advancements to customers, interbank lending and discounting of bills (Yuksel & Zengin, 2017). Interest income sis often measured as natural logarithm of total net interest income (Ghassan, 2019).

Management quality is another bank specific factors that explains capital adequacy. Management quality of a bank depicts the administrative ability of the bank to take calculated risk and earn from bank assets (Jumady, 2020). Proxies such loan size, earning per employee, expenses ratio, loan and unit cost of money lent are often adopted to measure quality of management (Gaur, 2021). Finally, Bank size is another factor that affects capital adequacy. The bank size is critical in examining bank specific factors affecting capital adequacy ratio (Muhindi & Ngaba, 2018). Bank size are often captured based on proxies such as log of total assets (Chodnicka-Jaworska, 2020).

1.1.2 Capital Adequacy

The capital adequacy is an obligation and requirement set by regulatory authority bodies over banks that forces them to hold a given level of capital at any given time to cover for system wide financial crushes Karugu, Achoki & Kiriri, 2018). Capital adequacy requirement are among the polices and rules originated by the central banks and directed at commercial banks for adoption and use to ensure banking sector stability. Further, Capital Adequacy refers to the level of capital stock that banks are expected to hold at any given time to enable them survive wide spread risks such as market, operational and credit risks (Nwankwo, 2019). Thus, Capital adequacy is the sum of financial resources contributed by owners of banks to eliminate chances of the commercial bank crossing over into financial distress (Nguyen, 2020).

Capital adequacy ensures that stock holders and bank depositors are hedged from potential risks such as bankruptcy, credit risk, interest rate risk among other risks (Runtu, Saerang & Pangemanan, 2017). Bank capital adequacy thus provides for protection of resources invested in the commercial banks by shareholders, depositors, other lenders the Central Bank and the whole economy. Further, capital adequacy ensures that the banks is managed efficiently and effectively to ensure the banking environs are safe to investors (Fliginskih et al., 2019). The capital stock held by the commercial bank thus act as a buffer against inadequate cash to undertake normal banking

activities. The bank' capital adequacy thus gives confidence to bank customers and shareholders hence preventing bank run (Musyoka, 2017).

The Basel Committee advanced a measure of banks capital adequacy based on a ratio that compares total capital held by a bank to risk adjusted assets. There are a number variations of the ratio with the capital adequacy ratio (CAR) being the dominant one. The ratio put leavers on banks' lending activity hence protecting it against credit risk. Further, the ratio restricts banks leveraging through deposits and other leveraging mechanism hence minimising the risk of insolvency and liquidation (Adamgbo et al., 2019). The CAR has been adopted by CBK to ensure that the banking institutions and system are able to handle minor losses without and not leading to wide spread economic distress (CBK,2020). The study will adopt CAR to capture capital adequacy given that the measure takes into consideration how the capital coverer the possible solvency risks resulting from over leverage.

1.1.3 Bank Specific factors and Capital Adequacy

The bank specific factors are critical for ensuring a bank has adequate level of capital to galvanise it and its stakeholders from risks and uncertainties. Empirical literature exists on the nexus between banks specific factors and capital adequacy both globally and locally. Abba, Okwa, Soje and Aikpitanyi (2018) evaluated the causal effect link between CAR and the bank-specific factors finding that ROA was a critical predictor of CAR. Other significant predictors of capital adequacy included credit risk, deposits financing and asset quality. Thoa, Anh and Minh (2020) evaluated whether internal banking factors determine CAR revealing that liquidity and Net interest margin had a direct impact on CAR. Total loans advanced had an inverse effect on CAR. Finally, leverage and Bank size did not influence CAR. Jane, Ayako and Kinai (2017) evaluated the predictors of capital adequacy among insurance firms operating in Kenya revealing that dividend payout ratio, profitability ratio, liquidity ratio cost of capital was critical to capital adequacy.

Further, Moussa (2018) examined factors predicting capital of banks noting that ROA, liquidity, net interest margin, private ownership, foreign ownership and inflation have a major impact on capital of the bank. Hadjixenophontos and Christodoulou-Volos (2018) on whether banks specific factors explain capital adequacy observed that there existed direct causal effect link between bank size, net interest margin, risk and CAR. Further, NPLs, regulatory requirements, leverage, competition, size, information asymmetry, return and corporate governance predicted capital

adequacy. Hadjixenophontos and Christodoulou-Volos (2018) was based outside Kenya, hence parameter estimates may not be readily be used by bank executives for decision making. .

1.1.4 Commercial Banks in Kenya

Annual report by CBK (2020) showed that there are some forty-three commercial banks licensed to operate in Kenya. The report further shows that 3 of the 43 commercial banks are state owned companies with government being the dominant shareholder. The remaining banks are privately owned by locals or foreigners. Further, 27 of the private banks are home grown while the 13 are foreign owned (CBK, 2020). Among the 43 commercial banks licensed by CBK, 12 banks have floated shares at the Nairobi Securities Exchange (NSE) with the remaining being none listed (NSE, 2020).

Capital adequacy issues have been very critical to commercial banks especially with the Basel group recommendations "Basel I, Basel II and Basel III" to protect banks from expected and unexpected risks both at firm level, industry wide, nationally and globally. The CBK requires commercial banks to hold minimum "Total Capital to total risk weighted assets of 14.5%, minimum Core Capital to total risk weighted assets of 10.5% and minimum Core Capital to Total deposits Liabilities of 8% (CBK, 2020)." The higher the bank's CAR above the minimum statutory level the better the financial stability and soundness of the bank.

1.2 Research Problem

Capital adequacy is central to sustainability and long-term survival of financial institutions by enabling them to survive both normal financial risks and unexpected uncertainties. The expected relationship between assets quality and CAR is positive such increasing assets quality leads to increasing CAR loans (Karugu, Achoki & Kiriri, 2018). The expected relationship between earnings ability of the bank and CAR is direct implying that an increasing profitability should result to increasing CAR (Ngumo, Collins & David, 2020). Literatures has also tended to reveal a direct causal effect link between CAR and firm size with increasing assets leading to increasing CAR. The relationship between CAR and net interest income is also expected to be positive. Increasing liquidity should also lead to increasing CAR (Ghassan, 2019). Finally, improving management quality ought to lead to increasing CAR among the banks.

Although CAR at commercial banks have risen due to risk-based standards being introduced by the regulator as well as other predictors such as bank specific bank factors. It is not clears how much capital adequacy is explained by bank specific factors (Njeri, 2017). The banking sector registered reduced performance in 2020 compared to 2019. Asset quality fell from 12.5% in 2019 to 14.5% at the end of 2020. Capital adequacy ratio measured by "Total Capital to Total Risk Weighted Assets ratio" rose to 19.0% in 2020 from 18.8% in 2019. Further, the liquidity ratio was at 54.5% in December 2020 compared to 49.7% in December 2019. Regarding profitability, the Central Bank of Kenya (CBK) reported that profitability before tax declined significantly from Ksh.159.1 billion recorded in December 2019 to Ksh.112.1 billion registered in December 2020. These was a declined by 29.5% (CBK, 2020). The decline in profitability was occasioned by the tough operating environment attributed to external and internal shocks associated with COVID-19 (CBK,2020).

Globally, Abba, Okwa, Soje and Aikpitanyi (2018) evaluated the causal effect link between CAR and the bank-specific factors establishing that ROA was a critical predictor of CAR. Other significant predictors of capital adequacy included credit risk, deposits financing and asset quality. Abba et al. (2018) study did not exhaustively consider the firm specific predictors of capital adequacy such as net interest income and quality of management. Thoa, Anh and Minh (2020) evaluated whether internal banking factors determine CAR. The study revealing that liquidity and Net interest margin had a direct impact on CAR. Total loans advanced had an inverse effect on CAR. Finally, leverage and Bank size did not influence CAR. Thoa and Anh (2017) were based in Vietnam hence may not be readily be applied for decision making in Kenyan context. Dao and Nguyen (2020) examined the nexus between banks performance and capital adequacy as well as predictors of capital adequacy. The size, management quality, loan loss provision, liquidity, Liquidity risk, asset quality and inflation. The study revealed that CAR and ROE were major affected by economic growth, loan growth, management quality and liquidity. Dao and Nguyen (2020) was based in Vietman banks that have different operating environment from those in Kenya.

Locally, Jane, Ayako & Kinai (2017) evaluated what affects capital adequacy in firms in the insurance sector. Regression analysis showed that dividend payout ratio, profitability ratio, liquidity ratio cost of capital was critical to capital adequacy. Among Deposit taking Saving and

credit cooperative organizations (DT-SACCOs), Njeri (2017) examined the predictors of capital adequacy with the study revealing that liquidity had positive association with CAR. Credit risk captured by non-performing loans ratio had a direct association with capital adequacy. Among the Microfinance banks (MFBs) in Kenya, Ndungu (2016) evaluated the determinants of capital structure. The findings of the study indicated that size and profitability were critical predictors of capital structure. Even though a number studies exit globally and locally a number of gaps have been identified. First, most studies relating bank specific factors to capital adequacy have not been carried out of Kenya. Secondly, studies done in Kenya have not exhaustively examined bank specific factors determining capital adequacy. Finally, most studies have tended to relate banks specific factors to bank performance with few studies relating banks specific factors to capital adequacy. The study thus sought to establish answer to the research question: what is the effect of bank specific factors on capital adequacy of commercial banks in Kenya?

1.3 Objective of the study

To determine the effect of bank specific factors on capital adequacy of licensed commercial banks in Kenya.

1.4 Value of the Study

The research will make available critical information for various purposes including policy, practice and theory. Regarding policy, the research seeks to inform various policies by the CBK. The CBK will find this study insightful to identifying current nexus between bank specific factors and CAR. The research will thus inform revision of requirements of capital adequacy among commercial banks. The study will thus give insights to the level of non-discretionary or statutory capital held by commercial banks at any give time.

The study will also be critical for practice especially for decisions making by executives and directors of Kenya's licensed commercial banks. The study is expected to make available useful information that can serve as an insight to management of commercial banks in determining how bank specific factors affect CAR. The management can thus make decisions regarding the level of bank specific factors that they should be at to ensure they hold adequate capital.

Finally, the research will inform theory advancement. The research findings will bridge gap in empirical and theoretical literature evaluating nexus between banks specific factors and capital

adequacy in banks. The study will also establish how shiftability, information asymmetry and the Buffer capital theory underpins the nexus between CAR and its firm specific predictors. The research additionally will serve empirical literature for researchers examining the factors affecting capital adequacy among banks.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter presents past studies on the association between banks specific factors and capital adequacy among banks. The chapter specifically presents the theoretical review, determinants of capital adequacy, the empirical review, summary and gaps and finally the conceptual framework.

2.2 Theoretical Review

The research on the nexus between CAR and its banks specific predictors was informed by information asymmetry, buffer capital, and shiftability theories.

2.2.1 Buffer Capital Theory

Buffer capital theory was advanced by Calem and Rob (1996) to explain the behavior of banks nearing the statutory minimum capital ratio. The theory holds that banks whose capital level had fallen and is approaching the minimum set will often inject additional capital and lower their risks drivers to costs associated with breach to statutory minimum capital requirements (Dao & Nguyen, 2020). The theory holds that the size of capital buffer on top of statutory capital requirements will determine how a bank behaves. Banks that have adequate capital buffers often concentrates on maintaining their level of capital while those that low capital buffers above the statutory capital requirements often finds themselves introducing fresh capital injection to add to their diminishing capital buffers. Thus, banks with adequate capital buffers above the statutory minimal capital requirements have direct capital and risk adjustments while those banks with inadequate capital buffer approaching statutory minimum capital often have inverse capital and risk (Haris et al., 2019).

There is a general agreement on capital adequacy position that commercial banking institutions with high CAR and capital buffers are able to survive and offer lending facilities during credit scrunch given that the buffer capital can absorb small losses (Jokipii & Milne, 2011). Moh'd Al-Tamimi, and Obeidat (2013) held that capital buffer ensures the bank has a safety net to absorb expected losses during economic stagnation and prevent losses from eating into depositors' funds. The goal of capital adequacy is to prevent and stop commercial banks from holding less than optimal capital given its risk structure and external shocks.

The buffer capital theory has certain limitations based on criticisms by various scholars. Nguyễn (2014) noted that there is an inverted U- shaped link between minimum statutory capital and firms' welfare. The research holds that there exists a direct nexus between capital adequacy requirement and welfare of the bank within a given limit. After the limit is exceeded, additional capital results to declining banks welfare. Clerc et al (2014) further revealed that higher minimum statutory capital needs may limit credit creation role of the banking sector. Martinez-Miera and Suarez (2014) reveal that welfare gains of increasing capital requirement is realized during abnormal times, however, in normal times with no crisis, holding higher capital than is needed is wasteful.

The theory is critical in the current study as it informs the rationale for commercial banks holding more than minim capital requirements by the CBK. The theory thus facilitates analysis effect of banks specific factors capital adequacy. Commercial banks do not hold same level of capital with individual banks holding varying levels of capital above the statutory minimum capital prescribed by CBK.

2.2.2 Theory of Informational Asymmetry

The theory developed from significant contribution from Akerlof (1970), Spence (1973) and Rothschild and Stiglitz (1976). The theory emerged from unbalanced information access for parties in the financial market. The theory explains that when a party in financial market does not have adequate information about the other Party in a transaction to make decisions regarding that is infomed, then information asymmetry is said to exist between the parties (Nyamweya and Obuya, 2020). In financial intermediation situation, the borrower often has more information about risks for which the funds are sought compared to the lending financial institution (Obuya & Olweny, 2017).

When there is information asymmetry, the market suffers from three main problems including moral hazard, adverse selection and monitoring cost. Adverse selection problem results when due to information asymmetry, the lender is not able to judge between good and bad borrowers hence it ends giving credit to borrowers who are not credit worthy leading to increasing non-performing loans (Mavlanova, Benbunan-Fich and Koufaris, (2012). Further good borrowers who would have paid on time without default ends up not accessing credit leading to reduced bank profitability. To reduce the problem of adverse selection, lending institutions often introduces risk premium such that all good borrowers servicing their loans according to credit terms ends up paying interest for

those borrowers who will end up not settling their loans borrowed. Adverse selection leads to increased cost of credit than it ought to be leading to reduced financial intermediation efficiency. Moral hazard arises when would be borrower conceals material information or provides misleading information about the risks involved in credit transaction hence putting the lender at disadvantage when making decisions based on information provided by borrowers (Wandera, 2013). The problems of adverse selection and moral hazard associated with information asymmetry results to reduced financial intermediation efficiency.

The theory of information asymmetry has been criticized based on some of its assumptions. The theory has been accused of assuming unidirectional information asymmetry where borrower possess more information that lender even when it is clear that sometimes information asymmetry is bidirectional (Fuhrmann, et al., 2017). The theory often assumes that borrowers possess more information than lenders concerning risks associated with investment opportunities for which credit is sought. In reality, lenders also possess certain information than the borrowers for instance hidden charges on loans (Matthews & Thompson, 2008).

Amidst the criticisms, information asymmetry theory information the current study on the nexus between banks specific factors and capital adequacy. Information asymmetry problems of adverse selection and moral hazard leads to rising non-performing loans and increasing loan losses. The level of NPLs in the loan book of a bank affects the level of capital adequacy level. The increasing non-performing loans of an indicator of worsening asset quality. Further, increasing loan losses due to increasing non-performing loans erodes the capital of the banking institution.

2.2.3 The Shiftability Theory of Liquidity

The theory was formally originated by Moulton (1918) to explain how banks exchange position between cash and cash equivalent financial assets depending on liquidity situation. Banks often hold cash reserve and a host of credit instruments that can easily traded at the secondary market to get liquid cash when need arises (Maaka, 2013). In line with the theory, the liquidity of a bank is a function of the ease by which the bank can shift it liquid assets to other parties in exchange of liquid cash when need arises without material loss of value (Casu & Girardone, 2006). Moulton (1918) argued that archiving minimum reserves does not need to rely on holding maturing bills, however, it needs the bank to hold a host of financial assets that can be shifted to other financial institutions like CBK when there is a need for instance liquidity problems.

The theory explains that shiftability is dependent on ready marketability or transferability of bank's assets its time of insufficient liquidity. The central bank has a critical role as lender of last resort enabling shiftability to operate. When a financial institution is in need of liquidity, its cash shift its financial assets like bills and bonds to the central bank who in term gives immediate cash needed to arrest the liquidity situation (Moulton, 1918). Some defects have been identified in the assumptions and working of shiftability theory. In situation of system wide crisis, the ease of transfer of this asset for liquidity purposes reduces as no party needs them (Summers, 1975). When all banks are seeking to liquidate their assets at the same time, it becomes almost impossible to get ready buyers for the same. Further, in such situation, the market value of the assets will drastically fall lading to loss of banks capital (Prochnow, 1949).

The theory informs this study on the nexus between bank specific factors and capital adequacy. Specifically, the theory informs the variable liquidity and how it related to capital adequacy. Banks that are liquid through having adequate financial assets stock it can shift in time of liquidity problems also tends to have adequate capital.

2.3 Determinants of Capital Adequacy

Literature has established that the predictors level of capital held by commercial banking institutions including banks specific factors, prudential regulations and Macro-economic factors. The study focused on bank specific factors. Bank specific factors are critical and incidental to capital adequacy and the long-term survival and growth of banking institutions. The bank specific factors of interest in the current study includes including asset quality, net interest income, bank size, liquidity, profitability and management quality.

2.3.1 Asset quality

Empirical literature has identified asset quality as one of bank specific factors that predicts capital adequacy. Assets quality is a measure of bank performance that captures the possibility of the bank assets like loans and advances getting into default as measured by cumulation of NPLs. The ratio of NPLs to total loans if often used to measure the quality of loan assets held by banking institutions. The lower the NPLs ratio, the higher the quality of bank loans (Kadioglu, Telceken & Ocal, 2017). Assets quality in the banking institutions is major predictor of capital adequacy and an indictor of the status of the bank as regards credit risk (Musyoka, 2017). Asset quality thus

determines the quality of banks resources and related risks that bank resources are exposed to such as credit risk (Karugu, Achoki & Kiriri, 2018). The quality of assets like loans determines how banks resources are protected from risk of default that may eat into capital stock of the bank when loan losses occur. Empirical literature has tended to establish an inverse relationship between assets quality ratio and capital adequacy in commercial banks (Gulati, Goswami & Kumar, 2019).

2.3.2 Liquidity

Liquidity is another critical predictor of bank capital adequacy. Liquidity is used to refer to ability of a firm to settle maturing obligations (Nersisyan & Dantas, 2017). Liquidity as used in banking context refers to the ability of the bank to shift its stock of non-cash liquid assets to cash when there is need. In general terms, liquidity shows the cash status of the bank in settling maturing obligation (Runtu, Saerang & Pangemanan, 2017). Liquid assets comprise the stock of financial assets that can be converted into cash easily with insignificant loss of value due to tractional costs (Subrahmanyam et al., 2017). The inability of the bank to settle maturing obligations arising out of inadequate liquidity may compromise the credit worthiness, creditors and depositors' confidence in the bank leading to depositors run and bank closure (Moh'd Al-Tamimi & Obeidat, 2013). The liquidity level of the bank determines the trust the shareholders, banks customers and creditors have in the bank hence the capital they are willing to inject into the bank. Banks with poor liquidity often finds themselves experiencing depositors run leaving the bank in capital inadequacy situation (Nersisyan & Dantas, 2017).

2.3.3 Profitability

Profitability as a predictor of capital adequacy refers to the ability of the bank to generate revenues on regular basis from is assets stock. Banks that are consistently generating adequate revenues in the form of profits are in a better situation to retain some of the profits earned to boost their capital. (Muhindi & Ngaba, 2018). Thus, the nexus between profitability and capital adequacy is often direct with increasing profitability leading to increasing capital adequacy (Gikombo & Mbugua, 2018). Further, Ngumo, Collins and David, (2020) held that profitability level is a source of capital injection to or withdrawal from the existing capital stock, such that profitable banks can introduce more capital injection in the form of retained earnings and reserves while loss making banks experience erosion of their capital stock. Mosa & Omran, (2017) also revealed that profitability level contributed to boosting capital level of the bank hence direct relationship.

2.3.4 Net Interest Income

Empirical literature has also identified net interest income as another bank specific predictor of capital adequacy. The interest income is a category of banks income that comprises interest on advances, income from investments, bills discounting and interbank lending. The bulk of conventional banks' earning comes from interest income with the rest emanating from non interest sources like fees income (Yuksel & Zengin, 2017). Interest income is a critical determinant of banks capital adequacy via profitability. Banks that are generating sufficient interest income, are able to generate consistent profitability level that leads to bosting of capital stock when more of the profits generated is retained as retained earnings or reserves forming part of the capital of the bank (Ghassan, 2019).

2.3.5 Quality of Management

The quality of the management as a predictor of capital adequacy of the banks refers to the administrative capability of the bank in guiding the bank towards success in its financial intermediation role (Jumady, 2020). Further, management quality describes the capability of the banks' executive officers to guide the bank to profitability. Quality of management is also called management efficiency that connotes the ability of bank to maximise returns and minimise operational costs in an effort to maximise the welfare of the shareholder (Koch and MacDonald, 2014). Management quality or management efficiency is often measured by proxies such as loan size, expense ratio, per employee earnings and unit cost of money lent per employee (Ibrahim et al., 2015). Quality of management is critical in efficient and effect management of banks financial resources with a focus of achieving stability, strength and profitability that eventually ensures capital adequacy in a bank (Nuhiu, Hoti & Bektashi, 2017).

2.3.6 Firm Size

Another firm level predictor of capital adequacy in banking institutions is firm size. Firm size is often quantified by total assets of the establishment. Most researchers have tended to adopt banks assets in its log form to measure the size of the bank (Platonova, 2014). The size of the bank as a predictor of capital adequacy deserves space in banks factors capital adequacy debate. Banks with large outlay of assets have tended also tended to be those that have adequate capital (Thoa & Anh, 2017).

2.4 Empirical Review

Empirical literature exists on the nexus between banks specific factors and capital adequacy both globally and locally. Among deposit taking banks in Nigeria, Abba, Okwa, Soje and Aikpitanyi (2018) evaluated the causal effect link between CAR and the bank-specific factors. The study adopted annual longitudinal data sourced from 12 banks over the period 2005-2014. The study adopted balanced panel data regression model to with findings establishing that ROA was a critical predictor of CAR. Other significant predictors of capital adequacy included credit risk, deposits financing and asset quality. Abba et al. (2018) the study did not exhaustively consider the firm specific predictors of capital adequacy such as net interest income and quality of management.

Among Vietnam banks, Thoa, Anh and Minh (2020) evaluated whether internal banking factors determine CAR. The study focused on factors including total loans, total assets of the bank, net interest margin, liquidity, leverage, cash, loans lost reserve among others as independent variable. The study collected data from 2009-2015 with FGLS panel regression model being adopted to correct for serial correlation and heteroskedasticity problems and estimate the parameters. The study revealing that liquidity and Net interest margin had a direct impact on CAR. Total loans advanced had an inverse effect on CAR. Finally, leverage and Bank size did not influence CAR. Thoa and Anh (2017) were based in Vietnam hence may not be readily be applied for decision making in Kenyan context.

Jane, Ayako & Kinai (2017) evaluated the predictors of capital adequacy among insurance firms operating in Kenya. The study was causation study with annual longitudinal secondary data sourced form 46 insurance firms. Regression analysis showed that dividend payout ratio, profitability ratio, liquidity ratio cost of capital was critical to capital adequacy. Jane, Ayako and Kinai (2017) did not exhaustively examine the predictors of capital adequacy besides it was based on insurance firms that have different legal operating environment from commercial banks in Kenya.

In a study of DT-SACCOs in Nairobi County, Njeri (2017) examined the major predictors of CAR. A causal research design was applied to a population of 35 licensed deposit taking (FOSA) SACCOs in Nairobi that were regulated by SASRA. This study adopted a census sampling

technique of 35 licensed deposits taking SACCOs in Nairobi and used annual longitudinal data sourced from Saccos Society Regulatory Authority (SASRA). Research established that liquidity, credit risk and deposits had positive association with core capital ratio. Further, capacity ratio and total deposit had a negative effect on core capital ratio. Njeri (2017) was based on DT-SACCOs that a different legal environment from commercial banks. Further, the study did not exhaustively examine factors predicting capital adequacy.

Dao and Nguyen (2020) examined the nexus between banks performance and capital adequacy as well as predictors of capital adequacy. The study sourced secondary longitudinal data from sixteen banks in Vietnam over the period 2010 to 2017. The study adopted simultaneous equation regression models with CAR and ROE being dependent variables. The independent variables predicting capital adequacy and profitability comprised loan growth, ROA, Tobin Q, economic growth, bank size, management quality, loan loss provision, liquidity, Liquidity risk, asset quality and inflation. The study revealed that CAR and ROE were major affected by economic growth, loan growth, management quality and liquidity. Dao and Nguyen (2020) was based in Vietman banks that have different operating environment from those in Kenya.

In a study of microfinance banks in Kenya, Ndung (2016) evaluated the predictors of capital structure. The study sourced longitudinal data ranging from 2011 to 2015 yielding 15 observations rom. The study further adopted multivariate regression model of panel in nature with findings showing that firm age, size, risks and profits were critical to capital structure. Further, the effect of firm age, size and profitability on capital structure was direct. Tax shield, asset tangibility, and business risks had inverse effect on capital structure. Ndung (2016) adopted fewer than 30 observations required of regression model hence the parameter estimates are misleading. Further, the study was based in microfinance institutions that have a slightly different legal environment from commercial banks in Kenya.

Milia, Sahut, Trimeche, Teulond (2016) evaluated whether parent company home environment factors affect the capital adequacy in subsidiary companies. The research revealed that financial soundness of parent bank affects capital adequacy of their subsidiaries distributed globally. Further, it was revealed that economic and regulatory situation in parent companies' country affects capital adequacy of subsidiary that its host country conditions. Milia, Sahut, Trimeche, Teulond (2016) focused on role of parent company country conditions on capital adequacy of

subsidiary country. The study ignored other factors affecting capital adequacy of subsidiary banks part from parent company conditions.

Among commercial banks in Tunisia, Moussa (2018) examined factors predicting capital of banks. The study collected longitudinal data ranging from 2000 to 2013. The study used multiple regression model to analyse data. The research revealed that ROA, liquidity, net interest margin, private ownership, foreign ownership and inflation have a major impact on capital of the bank. Moussa (2018) was carried out in Tunisia that has different operating environment from Kenya hence parameter estimates may not be relay be adopted for decision making locally.

In Cyprus, Hadjixenophontos and Christodoulou-Volos (2018) evaluated whether banks specific factors explain capital adequacy. The study was based on panel data model with findings showing that there existed direct causal effect link between bank size, net interest margin, risk and CAR. Further, NPLs, regulatory requirements, leverage, competition, size, information asymmetry, return and corporate governance predicted capital adequacy. Hadjixenophontos and Christodoulou-Volos (2018) was based outside Kenya, hence parameter estimates may not be readily be used by bank executives for decision making.

In a study of commercial banks in Kenya, Mugwang'a (2014) analysed the predictors of CAR. The study relied on longitudinal data collected over a period of five years from 2009 – 2013. The study was a census of all licensed commercial banks by CBK. The study adopted balanced panel data regression model with the findings revealing that solvency risk explained capital adequacy. Further, ROA, ROE, credit risk, liquidity risk and intrest rate risk did not explain CAR. Mugwang'a (2014) was based on data of five years up to the period ending 2014 hence another study needs to be carried out with more recent data set.

In a study of Islamic banks, Kalifa and Bektaş (2018) evaluated whether bank specific and macroeconomic factors affect capital adequacy. The study was carried out among 28 banks with data being analysed using panel data model. The study revealed that macroeconomic and banks specific factors explained CAR. Specifically, ROE, Leverage, credit risk, ROA and bank size had a strong impact on CAR. Further, market capitalization, inflation and exchange rate affected capital adequacy in Islamic banks. Kalifa and Bektaş (2018) was based in the context of Islamic banks

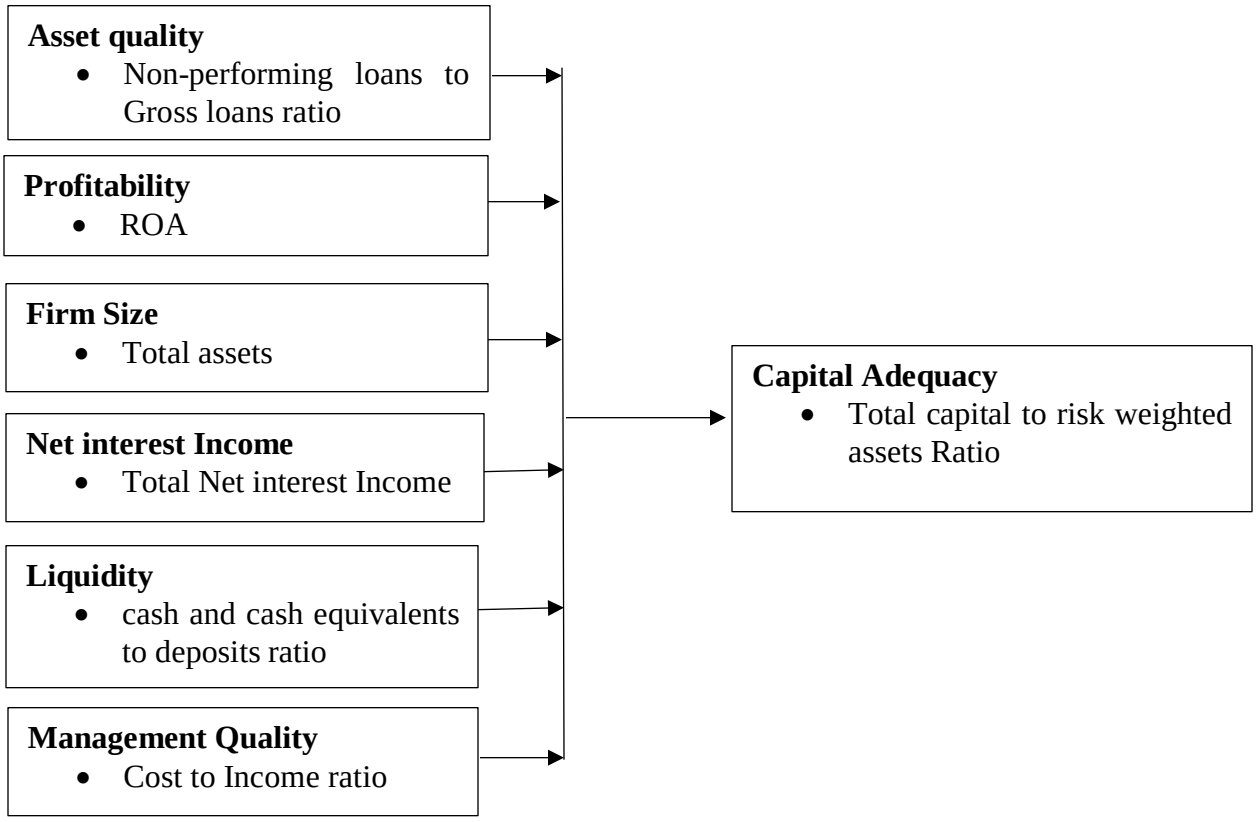
2.5 Summary and Research Gaps

The study was based on buffer capital theory, information asymmetry theory and shiftability theory. Buffer capital theory holds that banks keep excess capital beyond the statutory level. Information asymmetry theory showed that moral hazards and adverse selection leads to accumulation of NPLs that reduces banks assets quality and capital adequacy. Shiftability theory holds that banks keeps a given level of liquid assets than can easily be converted into cash when there is need. The empirical literature has examined the nexus between bank specific factors and capital adequacy revealing that combined bank specific factors explained capital adequacy. Even though a number studies exit globally and locally a number of gaps have been identified. First, most studies relating bank specific factors to capital adequacy have not been carried out of Kenya. Secondly, studies done in Kenya have not exhaustively examined bank specific factors determining capital adequacy. Finally, most studies have tended to relate banks specific factors to bank performance with few studies relating banks specific factors to capital adequacy.

2.6 Conceptual Framework

The conceptual model in figure 2.1 presents the expected relationship between bank specific factors and capital adequacy based on empirical and theoretical review. The dependent variable was capital adequacy measured a ratio of total capital to risk weighted assets (CAR). The independent variables included asset quality, profitability, quality of management, firm size, net intrest income and liquidity. Asset quality was measured using the ratio of NPLs to gross loans. The study expected an inverse relationship between NPLs ratio and capital adequacy. Profitability was measured by ROA. The research expected a positive relationship between ROA and capital adequacy. Firm size was measured based on logarithm of total assets. The study expected a direct relationship between CAR and firm size. The next independent variables was net intrest income measured by natural logarithm of Net intrest income. The study expected a positive relationship between CAR and net intrest income. The other explanatory variables was management quality measured by expense ratio. The study expected an inverse relationship between CAR and quality of management. Finally, liquidity was measured by cash and cash equivalents to total deposits ratio. The study expected an inverse nexus between CAR and liquidity ratio adopted.

Bank Specific Factors



Independent Variable **Dependent Variable.**

Figure 2. 1: Conceptual Model

CHAPTER THREE: METHODOLOGY

3.1 Introduction

The chapter covers the methodology that would be adopted in collecting and analysing data and making conclusions. The chapter specifically presents the research design, target population, data collection and data analysis.

3.2 Research Design

The research ascertained the nexus between bank specific factors and capital adequacy based on descriptive survey design. Descriptive survey often adopts descriptive and inferential statistics to analyse data collected (Saunders et al. (2009). The design was adopted based on the rationale that the researcher did not have control over the status of the variables in their natural setting and can only analyze their relationship based on ex post facto data (Saunders et al., 2009). Descriptive design relies on use of regression analysis to examine effect of one variable on another as in the case of this study.

3.3 Target Population

The study targeted 43 commercial banks that were licensed to operate between 2016 and 2021. Given the small size of the population, the research adopted census sampling. In this case all the licensed commercial banks were to participate in the study. Target population is the universe of elements that the researcher is studying and to which generalizations made after the study (Kothari,2004).

3.4 Data Collection

The research used secondary annual longitudinal data sourced from CBK annual banking report and individual banks audited financial statements for the study period. The data was collected over the 6-year period from 2016 to 2021. Data on capital adequacy included total capital and risk weighted assets. Data on asset quality included gross loans and non-performing. Data on liquidity included total cash and cash equivalents and deposits, Data on management efficiency included operational cost and operational income, data on firm size was total assets. Further, data on profitability included Total assets and profit before tax. Finally, data on net interest income was

Net interest income. The sourced data was entered into data collected sheet (see appendix I). The data collected was measured as presented in operationalization Table 3.1.

Table 3. 1: Operationalization of Study Variables

Variable	Notification	Measurement	Expected relationship
Dependent Variable			
Capital Adequacy	CAR	total capital to total risk weighted assets	
Independent Variables			
Profitability	ROA	profit before tax to total assets ratio	+
Interest Income	NII	Natural logarithm of net interest income	+
Liquidity	LQ	Cash and cash equivalents to deposits ratio	+
Firm Size	Size	Natural logarithm of Total Assets	+
Management Quality	MaQ	operational costs to operational income ratio	-
Asset Quality	AQ	Nonperforming loans to gross loans ratio	-

3.5 Data Analysis

The research sourced and entered data into MS Excel sheet where variables were calculated and exported to STATA version 15. The descriptive statistics included mean, standard deviation, minimum and maximum. The inferential analysis included the pairwise Pearson correlation coefficient and panel regression analysis. The balanced panel data regression enabled examination of the nexus between bank specific factors and capital adequacy of commercial banks in Kenya.

3.5.1 Regression Model

The panel regression model adopted is presented in equation [1]. The model is presented in the form of fixed effect model.

$$\mathbf{CARti = \alpha_0 + \alpha_1 ROA_{ti} + \alpha_2 NII_{ti} + \alpha_3 LIQ_{ti} + \alpha_4 Size_{ti} + \alpha_5 AQ_{ti} + \alpha_6 MaQ_{ti} + \mu_i + \varepsilon_{ti} \ldots\ldots\ldots\ldots [1]}$$

Where: **CAR** is capital Adequacy (Dependent Variable)

ROA is return on Assets

NII is Net Interest Income

LIQ is Liquidity

Size is firm Size

AQ is Asset Quality

MaQ is Management Quality

α_0 = intercept term

$\alpha_1, \alpha_2\ \alpha_3\ \alpha_4\ \alpha_5\ \alpha_6$ are coefficients of explanatory variables.

μ = Fixed effect term capturing unobserved time invariant entity characteristics

ε = idiosyncratic error term capturing unobserved time variant unobserved variables

t = current values and

i is 1,2,3……..,43 (cross sectional Units – Number of Commercial Banks)

3.5.2 Diagnostic Tests

Ordinary least squares regression is based on certain assumptions including linearity, normality, no multicollinearity, no autocorrelation, homoscedasticity and stationarity. Diagnostic tests should be carried out based on certain tests to ensure that assumptions are not violated so that the model of parameter estimation can be considered robust and fit for forecasting purposes (Bollen et al., 2016).

3.5.2.1 Normality Test

In statistics, normal data depicts equality of mean and median such that the when data is plotted on normal curve, the share become bell shaped (Ghasemi & Zahediasl, 2012). Regression is based on assumption of normality in the distribution of errors terms in the regression model. In this study, Skewness, Kurtosis and Jacque-bera used to test for normality. Skewness of residuals nearer zero and Kurtosis near 3 imply the data does nor deviate much from normality.

3.5.2.2 Autocorrelation Test

Autocorrelation as used in statistics describes the high correlation existing between data about variable at the current time and its lagged values (Brooks,2019). Autocorrelation is major problem often associated with long time series data. Ordinary least squares (OLS) regression model is based on assumption of no serial correlation in the error term over time. The study adopted Wooldridge tests to examine presence of serial correlation where p-value lower than 0.05 signify autocorrelation problem (Wang, 2006). In the presence of serial correlation, the study would adopt lags for the dependent variable if serial correlation happens in isolation. When serial correlation happens in the presence of heteroskedasticity and cross-sectional dependence, the study would adopt Panel correlated standard errors (PCSEs) regression model.

3.5.2.3 Multicollinearity Test

Multicollinearity refers to a condition in statistical data where explanatory variables are highly correlated among themselves (Granger, Newbold & Econom, 1974). OLS regression is based on the assumption of no multicollinearity. The research adopted Variance Inflation Factor (VIF) to examine presence of multicollinearity where VIF values higher than 10 signify presence of multicollinearity problem. In the presence of multicollinearity, the explanatory variables causing multicollinearity would be removed from the model.

3.5.2.4 Heteroscedasticity Test

Classical least squares regression is based on the assumption of homoscedasticity. The assumption is that error terms should have constant variance. Further, individual observations should not vary significantly from that of the true population (Asteriou & Hall, 2015). The opposite of homoscedasticity is heteroskedasticity that is associated with spurious regression. The research adopted Modified Wald test to test for presence of heteroscedasticity in which case p-values higher than 0.05 level of significance imply homoscedasticity. If the data suffers from

heteroscedasticity only, the study would adopt OLS with robust standard errors. However, heteroskedasticity in the presence of serial correlation and cross-sectional correlation, the study would adopt PCSEs model.

3.5.2.5 Cross-sectional Dependence

Cross sectional correlation happens when errors terms across panels are highly correlated. Cross-sectional Dependence test was based on Breusch-pagan LM test where a p-value lower than 0.05 would implying the presence of cross-sectional dependence. In such a case, the study would reject the adoption of panel data model with clustered standard errors and then adopt PCSEs. The presence of cross-sectional dependence is eliminated using PCSEs or FGLS models. PCSEs model is adopted when time is less than number of cross-sectional units while FGLS is used when time is greater than number of cross-sectional units.

3.5.3 Test of Significance

Test of significance will be carried out at 95% confidence level based on f -test and t-test. Bank specific factors will be said to have significant effect on capital adequacy f and t values calculated are greater than f and t critical.

CHAPTER FOUR

DATA FINDINGS AND DISCUSSIONS

4.1 Introduction

The chapter presents the findings and discussion on the effect of bank specific factors on capital adequacy of commercial banks licensed by CBK. The research targeted 43 commercial banks, however during data collection 7 commercial banks were dropped from the study being on receivership (Charterhouse Bank), statutory management (Chase Bank), or were wholly acquired and absorbed in their acquirer commercial banks (NIC Bank, Habib bank, Giro Bank) or lacked data for the full study period (DIB and Mayfair Bank). The study therefore collected and used data from 36 commercial banks. The chapter has been organised into descriptive analysis, diagnostic tests, regression analysis and Discussion of results.

4.2 Descriptive Analysis

The study adopted descriptive analysis identify the general flow of the data about the variables of concern. The study adopted measures of central tendency and dispersal including mean, minimum, maximum and standard deviation. The findings are presented in Table 4.1

Table 4. 1: Descriptive Analysis

	CAR	LQ	MaQ	ROA	AQ	Size	NII
Mean	0.205961	0.086402	0.670707	0.009258	0.189192	126,558.9	11,467.41
Min	-0.60544	0.002061	-18.1615	-0.30246	0.0009	3,855	74.023
Max	0.54	0.641646	9.630415	0.074021	0.945491	877,415	114,826
SD	0.111479	0.072587	2.109221	0.045992	0.159552	171,375.4	17,356.56

Size = Firm Size, **LQ**= Liquidity, **MaQ** = Management quality, **ROA** = Return on assets **AQ** = asset quality, **NII** = Net interest income, and **CAR**= capital adequacy ratio.

The dependent variable was capital adequacy ratio (CAR) generated by dividing total capital to total risk weighted assets of the banks. From the central bank classification, CAR of 19.5% and above is strong, 15.6% - 19.495 is satisfactory, 12% to 15.59% is Fair, 8.31%- 11.99% is considered marginal and 8.30% and below is unsatisfactory. The mean CAR for all the commercial banks within the study period was 20.59% hence it was strong. The individual banks had their CAR distributed around the mean industry CAR with about 11.14% as depicted by the standard deviation. The bank with the lowest CAR in the study period had a CAR of -60.5% which

is considered un satisfactory. The bank with highest CAR in the study period had a CAR of 54% which was considered strong.

The independent variables included liquidity (LQ), Management Quality (MaQ), Return on assets, Asset quality (AQ), Firm Size (Size) and interest Income (NII). Liquidity was measured by the ratio of Cash and cash equivalents to customer deposits. Mean liquidity for all the commercial banks was 0. 0864% implying that cash and cash equivalents were about 8.6% of the total customer deposits. The liquidity of individual banks was spread around the industry mean by about 7.25% as depicted by the standard deviation. The bank with the lowest liquidity had a liquidity of 0.2% while the bank with the highest liquidity had a liquidly of 64%.

Management quality was measured by ratio of operating expenses to operating income of the commercial bank. The lower the ratio, the more efficient the management of the bank. The mean management quality for all the commercial banks studied was 0.6707% implying that the operating expenses as a percentage ratio of the operating income was 67.1%. The management quality of the individual banks was dispersed from the mean by about 2.109 as depicted by the standard deviation implying a wide variation of the management efficiency of individual banks from the mean industry efficiency. The lowest management quality bank was -18.1 and the highest management quality bank was 9.6.

Bank profitability was measured by ROA which was calculated as the ratio of profit before tax to total assets ratio. The higher the ROA the better for the commercial bank . The mean ROA was 0.0092 implying that the profitability as a percentage ratio of assets in the industry was 0.9%. The dispersal of the individual banks ROA from the industry mean was 4.5% as depicted by the standard deviation. The lowest ROA was -30.2% implying negative profitability and the highest ROA was 7.4% implying positive profitability.

Asset quality was captured by the ratio of nonperforming loans to total customer loans of the commercial bank. The higher the higher the ratio, the lower the quality of loans offered by the commercial bank. The central bank asset quality requirements states that asset quality of 0-5% is considered strong, 5.1%-10.0% is considered satisfactory, 10.1%-15.0% is considered fair, 15.1%-20.0% is considered marginal and over 20% is considered unsatisfactory. The mean asset quality for all the commercial banks in the study period was 18.91% which is considered marginal. This implied the banking sector did not have strong or satisfactory asset quality with non-performing

loans being a major issue in the industry. The standard deviation showed that the asset quality if individual banks was spread away from the mean by about 15.9%. The lowest asset quality ratio was 0.09% capturing a bank with strong asset quality. The highest asset quality ratio was 94.54% capturing the bank with the most unsatisfactory asset quality.

Bank size was another bank specific factor as measured by the total assets. The mean bank size was Ksh. 126.5 billion with a standard deviation of Ksh. 171. 37 billion around the mean. The smallest bank size in the study period was Ksh. 3.85 billion and the largest bank size was Ksh. 877.4 billion. Interest income captured the income generated by the bank from interest earning assets such as loans and advances and government securities. The mean interest income was Ksh. 11.46 billion with a standard deviation of Ksh. 17.35 billion. The lowest interest income was Ksh.74 million and the highest interest income was Ksh.114.8 billion .

4.3 Diagnostic Tests

Ordinary least squares regression is based on certain assumptions including linearity, normality, no multicollinearity, no autocorrelation, homoscedasticity and stationarity. Diagnostic tests should be carried out based on certain tests to ensure that assumptions are not violated so that the model of parameter estimation can be considered robust and fit for forecasting purposes (Bollen et al., 2016). The findings are presented in the succeeding sub sections.

4.3.1 Test for Multicollinearity

Multicollinearity refers to a condition in statistical data where explanatory variables are highly correlated among themselves (Granger, Newbold & Econom, 1974). OLS regression is based on the assumption of no multicollinearity. The research adopted Variance Inflation Factor (VIF) to examine presence of multicollinearity where VIF values higher than 10 signify presence of multicollinearity problem. In the presence of multicollinearity, the explanatory variables causing multicollinearity would be removed from the model. The study first performed VIF test after regressing CAR against liquidity, Management Quality, Return on assets, Asset quality, Firm Size and interest Income. The results revealed that the VIF for firm size and interest income were higher than 10. The study thus dropped the variable (interest income) with the highest VIF value and then performed another VIF test without the variable interest income. The findings presented in Table

4.2 showed that after dropping interest income, all the explanatory variables had a VIF lower than 10 implying that multicollinearity was not a problem in the new model.

Table 4. 2: VIF Test for Multicollinearity

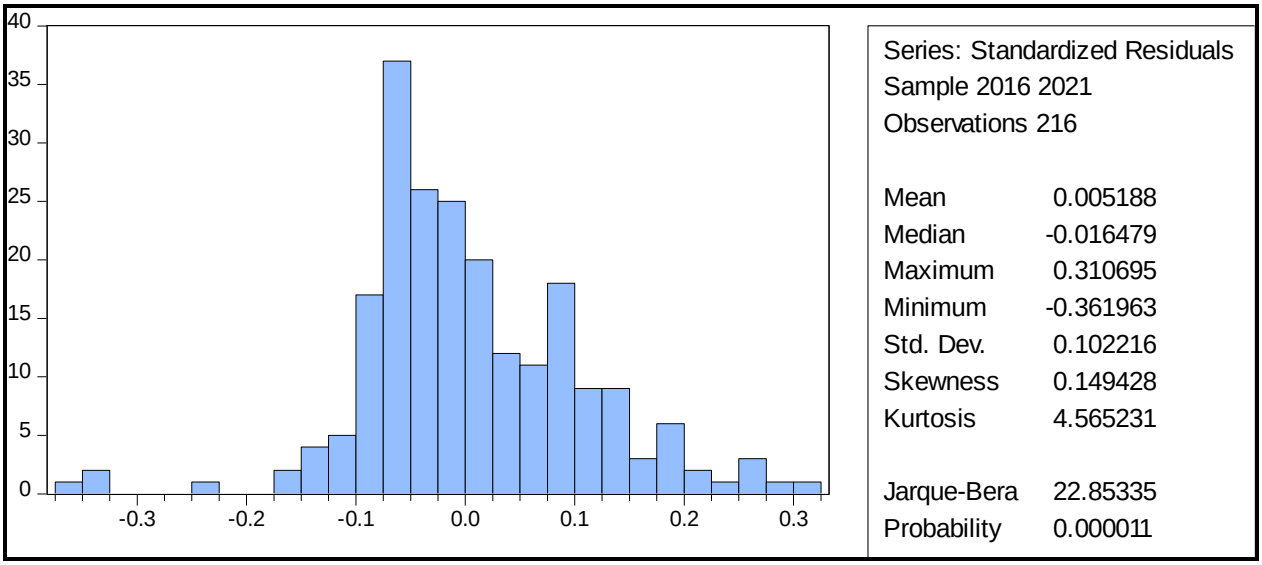
	Six Explanatory Variables		Five explanatory Variables	
Variable	VIF	1/VIF	VIF	1/VIF
Nii	26.00	.03845	-	-
Size	25.15	.03975	1.43	.7003
roa	2.11	.4737	2.11	.4746
aq	1.69	.5929	1.64	.6104
maq	1.18	.8475	1.13	.8878
lq	1.04	.9584	1.04	.9618
Mean Vif	9.53		1.47	

Size = Firm Size, **lq**= Liquidity, **maq** = Management quality, **roa** = Return on assets and **aq** = asset quality

4.3.2 Test for Normality

In this study, histogram, Skewness, Kurtosis and Jarque-Bera test was used to test for normality of the regression residuals. Skewedness closure to zero and Kurtosis closure to 3 imply the data depicts normal distribution. Probability values greater than 0.05 on Jarque-Bera test imply deviation of residuals from Normality. The study findings presented in Figure 4.1 showed that the Skewness and Kurtosis of the residuals were 0.149 and 4.456 respectively hence the residuals were not significantly distributed away from Normality.

Figure 4. 1: Test for Normality



4.3.3 Test of Heteroscedasticity

Classical least squares regression is based on the assumption of homoscedasticity. The assumption is that error terms should have constant variance. Further, individual observations should not vary significantly from that of the true population (Asteriou & Hall, 2015). The opposite of homoscedasticity is heteroskedasticity that is associated with spurious regression. The research adopted Modified Wald test to test for presence of heteroscedasticity in which case p-values higher than 0.05 level of significance imply homoscedasticity. If the data suffers from heteroscedasticity only, the study would adopt OLS with robust standard errors. However, heteroskedasticity in the presence of serial correlation and cross-sectional correlation, the study would adopt PCSEs model. The findings presented in Table 4.3 showed that the residuals showed presence of heteroskedasticity. The study next performed serial correlation to determine whether to adopt robust standard errors, clustered robust standard errors or Panel correlated standard errors (PCSEs) model to eliminate the problem of heteroskedasticity.

Table 4. 3: Modified Wald Test for Groupwise Heteroskedasticity

```
Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (36)  =    1.3e+05
Prob>chi2 =      0.0000
```

4.3.4 Test of Autocorrelation

Autocorrelation as used in statistics describes the high correlation existing between data about variable at the current time and its lagged values (Brooks,2019). Autocorrelation is major problem often associated with long time series data. Ordinary least squares (OLS) regression model is based on assumption of no serial correlation in the error term over time. The study adopted Wooldridge tests to examine presence of serial correlation where p-value lower than 0.05 signify autocorrelation problem (Wang, 2006). In the presence of high autocorrelation, the study would introduce lagged values of CAR. In addition, the study would adopt Panel correlated standard errors (PCSEs) model in the cases autocorrelation accompanied by Heteroskedasticity. The

findings presented in Table 4.4 revealed that the p-value associated with the test was lower than 0.05 level of significance hence the study concluded that the model suffered from first order serial correlation problem. Given that the model had earlier own suffered from problem of Heteroskedasticity, the study considered the adoption of either panel data model with robust clustered standard errors or Panel correlated standard errors (PCSEs) model by carrying out crosse-sectional dependence test.

Table 4. 4: Wooldridge tests for Autocorrelation

```
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F(  1,      35) =     13.434
           Prob > F =      0.0008
```

4.3.5 Cross-sectional Dependence

The study had earlier own established the presence of heteroskedasticity and serial correlation. To eliminate the problem, the study had the choice of using panel data model with clustered standard errors or Panel correlated standard errors (PCSEs). To make the choice, the study performed Cross-sectional Dependence test based on Breusch-pagan LM test and Pesaran Scaled LM test. A p-value lower than 0.05 would implying the presence of cross-sectional dependence. In such a case, the study would reject the adoption of panel data model with clustered standard errors and then adopt PCSEs. The Findings presented in Table 4.5 showed that the p-values associated with Breusch-pagan LM test and Pesaran Scaled LM test were lower than 0.05 level of significance hence PCSEs model was adopted for estimating the coefficients in the model.

Table 4. 5: Cross-sectional Dependence Test

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	867.1292	630	0.0000
Pesaran scaled LM	6.680360		0.0000
Pesaran CD	1.429842		0.1528

4.4 Regression Analysis

The study adopted Prais-Winsten's Panel Correlated Standard Errors (PCSEs) Model. Given that the model suffered from group autocorrelation, contemporaneous correlation and group heteroscedasticity, the study adopted PCSEs model that corrects for contemporaneous correlation and smaller standard errors introduced by heteroscedasticity. The findings are presented in Table 4.6.

Table 4. 6: Panel Correlated Standard Errors (PCSEs) Regression Model

Prais-Winsten regression, correlated panels corrected standard errors (PCSEs)

Group variable:	id	Number of obs	= 216
Time variable:	year	Number of groups	= 36
Panels:	correlated (balanced)	Obs per group:	
Autocorrelation:	panel-specific AR(1)	min	= 6
		avg	= 6
		max	= 6
Estimated covariances	= 666	R-squared	= 0.5919
Estimated autocorrelations	= 36	Wald chi2(5)	= 33.36
Estimated coefficients	= 6	Prob > chi2	= 0.0000

car	Panel-corrected Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
roa	.6514317	.2696905	2.42	0.016	.1228481	1.180015
lq	.1251277	.0544243	2.30	0.021	.0184581	.2317974
size	-.0206796	.0051439	-4.02	0.000	-.0307615	-.0105977
aq	-.1304107	.0399069	-3.27	0.001	-.2086267	-.0521947
maq	.0108604	.0051805	2.10	0.036	.0007068	.0210141
_cons	.4269231	.0546	7.82	0.000	.3199091	.5339371

rhos = .7411368 -.4692642 .8278455 -.0116304 .864301 ... .8098488

Size = Firm Size, **lq**= Liquidity, **maq** = Management quality, **roa** = Return on assets **aq** = asset quality and **car** = capital adequacy ratio.

Table 4.6 showed that Coefficient of determination (R-squared) was 0.5919 implying that the model explains 59.1% in the total variation in capital adequacy of the commercial banks. The

residual variation in the dependent variable is explained by unobserved variables that were not in the current model of analysis. The overall p-value in the model was 0.000 implying that bank specific factors adopted in the model as regressors had a significant effect on capital adequacy of the commercial banks studied.

Further, the effect of individual bank specific factors on capital adequacy was examined using t-test and p-values. The intercept term (α_0) showed that when the bank specific factors under the study are held constant at zero, capital adequacy was .4269. The study revealed the effect of return on assets on capital adequacy was positive and significant (α_1 = .6514, t= 2.42 and p= .016 < .05). The effect of bank liquidity on capital adequacy was positive and significant (α_2 =.1251, t= 2.30 and p= .021<.05). The effect of bank size on capital adequacy was inverse and significant (α_3= -.020, t= -4.02 and p=.000<.05). The effect of asset quality on capital adequacy was negative and significant (α_4=.13, t= -3.27, p=.001<.05). Finally, the effect of management quality on capital adequacy was positive and significant (α_5=.010, t=2.10, p=.036). The model was thus estimated as

CAR_{ti} = .4269 + .6514 ROA_{ti} + .125 LQ_{ti} - .020$Size_{ti}$ - .13AQ_{ti} + .125 MaQ_{ti} ……[1]

4.5 Discussion of Findings

The study had examined the effect of bank specific factors on capital adequacy of commercial banks in Kenya. The study specifically examined the effect of bank size, liquidity, management quality, return on assets and asset quality on capital adequacy. The study adopted panel correlated standard errors model. The established that the model (bank size, liquidity, management quality, return on assets and asset quality) explained 59.1% of the variation in capital adequacy with the remaining 40.9 % being explained by variables that were not part of the study. Further, the study revealed that bank specific factors studied (bank size, liquidity, management quality, return on assets and asset quality) had a significant effect on capital adequacy of the commercial banks (Chi2 =33.36 and p=.000).

The study also examined the effect of individual bank specific factors on capital adequacy of commercial banks licenced by the central bank of Kenya. The study revealed the effect of return on assets on capital adequacy was positive and significant (α_1 = .6514, t= 2.42 and p= .016 < .05). The positive effect means that for every one unit increase in return on assets, capital adequacy

increased by .65 units. The positive effect of return on assets on capital adequacy imply that as an increase in profitability as measured by return on assets leads to increase in capital adequacy of commercial banks in Kenya. Increased profitability means increased retained earnings of the commercial bank that leads to improved equity and hence capital adequacy of the commercial bank. The finding agrees with Abba, Okwa, Soje and Aikpitanyi (2018) who established that CAR was significantly predicted profitability such that increasing profitability led to increased income retainment thus bosting capital adequacy.

The effect of bank liquidity on capital adequacy was positive and significant (α_2 =.1251, t= 2.30 and p= .021<.05). The positive effect of bank liquidity on capital adequacy means that for every one unit increase in liquidity ratio, capital adequacy improved by .125 units. The finding implies that increasing liquidity in terms of cash and cash equivalents leads to increased credit worthiness and trust in the bank by customers and investors hence increased capital adequacy through attraction of more share capital to the bank. The results are in agreement with Jane, Ayako and Kinai (2017) that showed that liquidity ratio was critical to capital adequacy. Njeri (2017) found that liquidity had positive association with core capital ratio.

The effect of bank size on capital adequacy was inverse and significant (α_3= -.020, t= -4.02 and p=.000<.05). The negative effect of the bank size on capital adequacy means that for every one unit increase bank size as measured by total assets, the capital adequacy reduces by .020 units. Increasing bank assets such as loans and advances to customers without corresponding increase in capital of the bank leads to reduction in capital adequacy ratio hence putting the bank at the risk of liquidation from investors and the regulator. An increase in assets should be accompanied by proportionate increasing total capital of the commercial bank to maintain the capital adequacy ratio as required by the regulator. Ndung (2016) showed that size, age and profitability were critical predictors of capital structure. Further, Kalifa and Bektaş (2018) revealed a direct nexus between CAR and bank size.

The effect of asset quality on capital adequacy was inverse and significant (α_4=-.13, t= -3.27, p=.001<.05). The negative effect of the asset quality on capital adequacy means that for every one unit increase in asset quality ratio, capital adequacy reduces by .13 units. Increasing asset quality ratio means that non-performing loans as a proportion of gross loans increases leading to falling asset quality. Reducing assets quality due to increasing asset quality ratio means that loan

losses rise eating into profits of the commercial bank and reducing amount that can be retained out of profits to lead to increased equity. Hadjixenophontos and Christodoulou-Volos (2018) showed that CAR was predicted by NPLs and credit risk.

Finally, the effect of management quality on capital adequacy was positive and significant (α_5=.010, t=2.10, p=.036). The finding showed that an increase in management quality by one unit leads to increase in capital adequacy ratio by .010 units. Increasing management quality is associated with improved management efficiency hence improved capital adequacy. The finding agrees with Dao and Nguyen (2020) who showed that variables predicting capital adequacy and profitability comprised management quality, loan growth, ROA, Tobin Q, economic growth, bank size, loan loss provision, liquidity risk, asset quality and inflation.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The chapter presents the summary of findings, conclusion, recommendation, limitations and areas for further studies.

5.2 Summary of findings

The study had examined the effect of bank specific factors on capital adequacy of commercial banks in Kenya. The regression analysis showed that the model explained 59.1% of the variation in capital adequacy. Further, the study revealed that bank specific factors studied (bank size, liquidity, management quality, return on assets and asset quality) had a significant effect on capital adequacy of the commercial banks. Moreover, the study revealed the effect of return on assets on capital adequacy was positive and significant. The effect of bank liquidity on capital adequacy was positive and significant. Further, the effect of bank size on capital adequacy was inverse and significant. The effect of asset quality on capital adequacy was negative and significant. Finally, the effect of management quality on capital adequacy was positive and significant.

5.3 Conclusion

Overall, the study concluded that bank specific factors studied (bank size, liquidity, management quality, return on assets and asset quality) had a major effect on capital adequacy of the commercial banks licensed by CBK. Further, the positive effect of profitability on capital adequacy means that increase in return on assets leads to increase in capital adequacy. The study thus concluded that increase in profitability as measured by return on assets leads to increase in capital adequacy of commercial banks in Kenya. Increased profitability means increased retained earnings of the commercial bank that leads to improved equity and hence capital adequacy of the commercial bank. The positive effect of bank liquidity on capital adequacy imply that increase in liquidity ratio leads to increasing capital adequacy. The study thus concluded that increasing liquidity in terms of cash and cash equivalents leads to increased credit worthiness and trust in the bank by customers and investors hence increased capital adequacy through attraction of more share capital to the bank.

The inverse effect of the bank size on capital adequacy implies that increasing bank size leads to increasing capital adequacy. The study concluded that increasing bank assets such as loans and advances to customers without corresponding increase in capital of the bank leads to reduction in capital adequacy ratio hence putting the bank at the risk of liquidation from investors and the regulator. An increase in assets should be accompanied by proportionate increasing total capital of the commercial bank to maintain the capital adequacy ratio as required by the regulator. Given the negative effect of the asset quality on capital adequacy, the study concluded that increasing asset quality ratio means that non-performing loans as a proportion of gross loans increases leading to falling asset quality. Reducing assets quality due to increasing asset quality ratio means that loan losses rise eating into profits of the commercial bank and reducing amount that can be retained out of profits to lead to increased equity. Finally, given that increase in management quality leads to increase in capital adequacy, the study concluded that increasing management quality is associated with improved management efficiency hence improved capital adequacy.

5.4 Recommendations

The study findings inform various recommendations in the area of practice and policy. Given that return on assets had positive effect on capital adequacy, the study recommends to management of commercial banks to seek to increase their profitability via interest based and non-interest-based revenue sources. Beyond their traditional lending activities, commercial banks should diversify their revenue sources to increase their profitability and capital adequacy. Increased profitability means increased retained earnings of the commercial bank that leads to improved equity and hence capital adequacy of the commercial bank. The study also recommends to the CBK to continue tightening supervision of commercial banks to ensure the reported ROA in the audited financial statements reflect the true and fair view of the banks as regards the profitability.

The study also revealed a direct effect of bank liquidity on capital adequacy of the licensed commercial banks. In line with the finding, the study recommends to the management of commercial banks to strengthen their liquidity position. The banks should have adequate liquidity to settle maturing obligations including fixed and demand deposits. Increasing liquidity in terms of cash and cash equivalents leads to increased credit worthiness and trust in the bank by customers and investors hence increased capital adequacy through attraction of more share capital to the bank. The CBK should also continue exercising close and stringent supervision of the commercial banks

liquidity to ensure it is within acceptable level especially strong or satisfactory level. The CBK should also be flexible in provision of emergency liquidity to commercial through means such as discount window and repo rates.

The study also showed that bank size had a direct effect on capital adequacy. The study suggests to management of commercial banks ought not increase their assets size without proportionate increase in total capital. The bank assets are often dominated by advances to customers that are exposed to credit risk. The bank should therefore increase their capital to match increase in assets size to avoid reduction in capital adequacy ratio. Increasing bank assets such as loans and advances to customers without corresponding increase in capital of the bank exposes the bank to risk of liquidation from investors and the regulator. The study also recommends to the CBK to continue monitoring asset growth by commercial banks especially the loans growth and to ensure such growth are accompanied by proportionate growth in equity capital, retained earnings and reserves.

The study also revealed asset quality had an inverse effect on capital adequacy hence informing various recommendations. The study suggests to management of commercial banks to improve their credit analysis and implement stringent loan application screening to weed out prospective loan defaulters. Reducing assets quality means that loan losses rise eating into profits of the commercial bank and reducing amount that can be retained out of profits to lead to increased equity. The banks should avoid aggressive loan expansion without proportionate credit worthiness consideration. The CBK should also continue monitoring the asset quality of the commercial banks to ensure that the banking system does not suffer from widespread increasing non-performing loans as ratio of gross loans. The CBK should also ensure that the commercial banks have adequate loan loss provision to cover the possible loan losses that might be suffered by the individual commercial banks.

Finally, given the positive effect of management quality on capital adequacy, the study recommends to Increasing management quality is associated with improved management efficiency hence improved capital adequacy. The management of commercial banks should implement continuous cost reduction strategies and efficiency improvement to increase the capital adequacy of the banks. The CBK should also rigorously monitor the efficiency improvement mechanisms among commercial banks to ensure their long terms stability.

5.5 Limitations of the study

The study was successfully carried; however, a few limitations exist that informs decision making based on findings and future researches. First, the study was limited five bank specific factors that affect capital adequacy. Any reliance on the parameter estimates for the purpose of decision making by management of commercial banks should be made with care given that addition of variables to the model may be associated with change in the magnitude of the parameters.

Secondly, the study was based on commercial banks licenced by Central Bank of Kenya. Therefore, the findings are more relevant for management decision among commercial banks. The findings therefore may not be readily domesticated in other financial institutions such as deposit taking microfinance institutions, credit only microfinance institutions and deposit taking Saccos. The commercial banks operate under different regulations (such as banking act) that have different requirements as regards capital adequacy, liquidity, management quality and asset quality among others.

Thirdly, the study was based on a time period of six years using annual secondary data. The period is not long enough to observe structural breaks in data that might also have an effect on capital adequacy of the commercial banks. Such structural breaks include interest regimes changes in the early 90s, global credit crunch of 2009 among other shocks that have affected banking sector in Kenya in the past.

5.6 Areas for further studies

Based on the fact that the findings may have limited application in the commercial banking institutions, the study recommends to future researchers to carry out the same study in other financial institutions including deposit taking microfinance institutions, deposit taking Savings and credit cooperatives and credit only microfinance institutions. Such a study would enable the establishments of whether the findings hold in various contexts and improve application of findings for decision making.

The study also noted that the parameter estimates should be applied with caution among commercial banks given that the study was limited to only five bank specific factors. The study recommends that future studies in commercial banks examining the effect of bank specific factors on capital adequacy to should consider other factors that were dropped or not covered within this

study. Such factors can include interest income, non-interest income, retained earnings, provision for loan losses among other factors.

The study also recommends that future studies should be carried out with longer span of 10 years and above to isolate various structural breaks that might exist in the banking data. Such isolation, may make it possible to isolate effect of bank specific factors, macroeconomic factors and global shocks on capital adequacy of the commercial banks in Kenya.

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APPENDICES

Appendix I: Data Collection Sheet

Variable	Data	2016	2017	2018	2019	2020	2021
Return on Assets	Profit before Tax						
	Total Assets						
Capital Adequacy	Total capital						
	Total Risk weighted Assets						
Interest Income	Net Interest Income						
Firm size	Total Assets						
Liquidity	Cash and Cash equivalents						
	Total customer deposits						
Assets Quality	Non-performing loans						
	Gross customer loans						
Management Quality	Operating Expenses						
	Operating income						

Appendix II: Study Variables

ID	YEAR	BANK	CAR	lnSize	LQ	MaQ	ROA	lnNII	AQ
1	2016	Absa Bank Kenya Plc	0.179	12.4665	0.042035	0.681429	0.040232	10.2443	0.065053
1	2017	Absa Bank Kenya Plc	0.18	12.5124	0.062469	0.664031	0.03683	10.2097	0.071181
1	2018	Absa Bank Kenya Plc	0.16382	12.6927	0.085544	0.670859	0.031504	10.2768	0.074391
1	2019	Absa Bank Kenya Plc	0.16714	12.8323	0.089598	0.642252	0.031695	10.3413	0.065849
1	2020	Absa Bank Kenya Plc	0.174593	12.8425	0.049011	0.752877	0.021961	10.3544	0.074448
1	2021	Absa Bank Kenya Plc	0.171448	12.9686	0.099865	0.587891	0.034344	10.3731	0.07727
2	2016	Access Bank Plc	0.208	9.25579	0.103933	0.852651	0.015289	7.2653	0.126815
2	2017	Access Bank Plc	0.302	9.23941	0.142529	0.944464	0.005245	7.02311	0.216565
2	2018	Access Bank Plc	0.196351	9.23362	0.085917	1.11816	-0.00962	6.91893	0.241957
2	2019	Access Bank Plc	0.201517	9.13967	0.062258	1.06299	-0.00604	6.92509	0.300287
2	2020	Access Bank Plc	0.210927	9.22493	0.116383	3.47675	-0.19809	6.81088	0.045677
2	2021	Access Bank Plc	0.206561	9.4888	0.002456	0.921003	0.006964	6.76552	0.064578
3	2016	African Banking Corporation Ltd	0.16	10.0178	0.077053	0.853735	0.009901	8.01372	0.189056
3	2017	African Banking Corporation Ltd	0.151	10.1188	0.107487	0.873383	0.008184	7.94457	0.215931
3	2018	African Banking Corporation Ltd	0.158346	10.2114	0.067211	0.907167	0.005791	8.01927	0.245356
3	2019	African Banking Corporation Ltd	0.153763	10.264	0.08292	0.898357	0.005727	8.05749	0.176818
3	2020	African Banking Corporation Ltd	0.152074	10.3934	0.064703	0.912258	0.004503	8.06527	0.155958
3	2021	African Banking Corporation Ltd	0.162021	10.5007	0.009516	0.928743	0.003467	8.0588	0.197218
4	2016	Bank of Africa (K) Ltd	0.162	10.933	0.152239	1.00306	-0.00029	8.7819	0.287994
4	2017	Bank of Africa (K) Ltd	0.158	10.9003	0.138281	0.989773	0.000646	8.32488	0.314716
4	2018	Bank of Africa (K) Ltd	0.160227	10.8012	0.334513	0.974411	0.00427	8.12849	0.362179
4	2019	Bank of Africa (K) Ltd	0.108264	10.6919	0.277554	-4.18033	-0.06659	7.98146	0.399095
4	2020	Bank of Africa (K) Ltd	0.16333	10.7126	0.258198	1.29987	-0.01514	7.897	0.397666
4	2021	Bank of Africa (K) Ltd	0.175443	10.6771	0.015677	0.902889	0.00669	7.90349	0.31712
5	2016	Bank of Baroda (K) Limited	0.305	11.3255	0.056772	0.27739	0.046751	9.16823	0.089055
5	2017	Bank of Baroda (K) Limited	0.323	11.4735	0.054461	0.229163	0.052563	9.25393	0.06067
5	2018	Bank of Baroda (K) Limited	0.346607	11.7201	0.058736	0.250336	0.041939	9.36757	0.08985
5	2019	Bank of Baroda (K) Limited	0.327358	11.8728	0.062536	0.29466	0.038142	9.53135	0.083632
5	2020	Bank of Baroda (K) Limited	0.307109	12.0216	0.050072	0.285474	0.03482	9.64549	0.123986
5	2021	Bank of Baroda (K) Limited	0.299852	12.1028	0.070992	0.289302	0.037049	9.75969	0.104668
6	2016	Bank of India	0.457	10.7751	0.048512	0.205714	0.045697	8.39442	0.014054
6	2017	Bank of India	0.54	10.9443	0.068584	0.199049	0.047236	8.55357	0.020943
6	2018	Bank of India	0.4392	11.0459	0.051645	0.273699	0.039048	8.66454	0.070328
6	2019	Bank of India	0.484201	11.0436	0.055037	0.202231	0.044747	8.68178	0.089065

6	2020	Bank of India	0.485305	11.227	0.043121	0.271115	0.036377	8.72629	0.047474
6	2021	Bank of India	0.522009	11.3721	0.043534	0.202953	0.039739	8.83088	0.027802
7	2016	Citibank N.A. Kenya	0.264	11.5456	0.093134	0.328399	0.058389	8.89717	0.028504
7	2017	Citibank N.A. Kenya	0.256	11.4951	0.113918	0.330326	0.064877	8.77204	0.045273
7	2018	Citibank N.A. Kenya	0.276363	11.3579	0.115259	0.384877	0.065893	8.76294	0.03005
7	2019	Citibank N.A. Kenya	0.27151	11.478	0.163917	0.397904	0.058471	8.85219	0.041229
7	2020	Citibank N.A. Kenya	0.225126	11.5755	0.13507	0.377537	0.051478	8.74097	0.028193
7	2021	Citibank N.A. Kenya	0.187859	11.7825	0.252031	0.366303	0.044593	8.78821	0.018971
8	2016	Co - operative Bank of Kenya Ltd	0.228	12.7657	0.063623	0.560507	0.051497	10.6477	0.046699
8	2017	Co - operative Bank of Kenya Ltd	0.227	12.8553	0.051919	0.586993	0.043105	10.599	0.074155
8	2018	Co - operative Bank of Kenya Ltd	0.178504	12.9198	0.068611	0.57669	0.043073	10.6593	0.11241
8	2019	Co - operative Bank of Kenya Ltd	0.157701	13.0162	0.051907	0.561256	0.045208	10.6749	0.110672
8	2020	Co - operative Bank of Kenya Ltd	0.169895	13.116	0.03493	0.666129	0.034139	10.7496	0.16849
8	2021	Co - operative Bank of Kenya Ltd	0.171156	13.2	0.048638	0.615152	0.039462	10.8637	0.12957
9	2016	Consolidated Bank of Kenya Limited	0.079	9.54094	0.036483	1.1925	-0.0199	7.42165	0.197538
9	2017	Consolidated Bank of Kenya Limited	0.051	9.50718	0.067272	1.34364	-0.03263	7.20389	0.251063
9	2018	Consolidated Bank of Kenya Limited	0.297824	9.464	0.065813	2.30561	-0.02728	7.24527	0.253216
9	2019	Consolidated Bank of Kenya Limited	0.135241	9.3814	0.069367	2.55812	-0.04356	7.10365	0.29477
9	2020	Consolidated Bank of Kenya Limited	0.091652	9.4639	0.043516	1.20465	-0.02033	6.97057	0.240474
9	2021	Consolidated Bank of Kenya Limited	0.053039	9.56682	0.008659	1.21816	-0.02002	7.15096	0.275107
10	2016	Credit Bank Ltd	0.228	9.40936	0.05957	0.871962	0.012949	7.36169	0.080852
10	2017	Credit Bank Ltd	0.159	9.57949	0.06439	0.867679	0.012375	7.33519	0.086226
10	2018	Credit Bank Ltd	0.145069	9.78726	0.073189	0.804802	0.018658	7.51372	0.082813
10	2019	Credit Bank Ltd	0.149579	9.9777	0.051422	0.831254	0.01393	7.6742	0.100779
10	2020	Credit Bank Ltd	0.145333	10.0495	0.043028	0.995167	0.000346	7.83275	0.115178
10	2021	Credit Bank Ltd	0.158237	10.1617	0.019655	0.87284	0.007917	7.77328	0.282389
11	2016	Development Bank of Kenya Ltd	0.251	9.70613	0.043961	0.843643	0.005786	7.46745	0.257265
11	2017	Development Bank of Kenya Ltd	0.236	9.70015	0.045856	0.885623	0.003554	7.2912	0.215686
11	2018	Development Bank of Kenya Ltd	0.232279	9.63712	0.01682	0.684397	0.011017	7.26962	0.28701
11	2019	Development Bank of Kenya Ltd	0.314672	9.6394	0.054283	0.265618	0.074021	7.19582	0.340884
11	2020	Development Bank of Kenya Ltd	0.22247	9.75394	0.095865	0.959511	0.001103	7.09977	0.336979
11	2021	Development Bank of Kenya Ltd	0.195284	9.75783	0.008744	0.839651	0.00376	7.13183	0.29311
12	2016	Diamond Trust Bank Kenya Limited	0.185	12.4054	0.087597	0.450026	0.036359	10.1188	0.038955
12	2017	Diamond Trust Bank Kenya Limited	0.19	12.5065	0.079016	0.490734	0.030465	10.1517	0.075878

12	2018	Diamond Trust Bank Kenya Limited	0.211076	12.5479	0.133591	0.444079	0.03291	10.2051	0.072468
12	2019	Diamond Trust Bank Kenya Limited	0.209136	12.5681	0.082512	0.397242	0.032304	10.1046	0.08301
12	2020	Diamond Trust Bank Kenya Limited	0.224719	12.6514	0.071313	0.710071	0.012627	10.0154	0.118995
12	2021	Diamond Trust Bank Kenya Limited	0.211536	12.6958	0.076264	0.698441	0.013527	10.071	0.157978
13	2016	Ecobank Kenya Ltd	0.194	10.7605	0.044565	3.24465	-0.06131	7.85197	0.195634
13	2017	Ecobank Kenya Ltd	0.16	10.8866	0.085438	1.48803	-0.02683	8.21159	0.386232
13	2018	Ecobank Kenya Ltd	0.165912	10.9053	0.07294	0.951074	0.002502	7.90418	0.216656
13	2019	Ecobank Kenya Ltd	0.162655	11.2303	0.019935	0.919456	0.003228	8.02485	0.198317
13	2020	Ecobank Kenya Ltd	0.158702	11.4556	0.094192	0.997891	0.000064	8.3097	0.162811
13	2021	Ecobank Kenya Ltd	0.172411	11.5462	0.131149	0.840101	0.005919	8.29411	0.161224
14	2016	Equity Bank Kenya Ltd	0.155	12.8473	0.04163	0.54738	0.059982	10.6706	0.069929
14	2017	Equity Bank Kenya Ltd	0.165	12.9151	0.052345	0.516294	0.056806	10.5399	0.066568
14	2018	Equity Bank Kenya Ltd	0.13956	12.9911	0.218862	0.530135	0.055603	10.6316	0.073862
14	2019	Equity Bank Kenya Ltd	0.173544	13.1373	0.226779	0.528582	0.051177	10.714	0.090118
14	2020	Equity Bank Kenya Ltd	0.162477	13.4115	0.017751	0.643873	0.021279	11.0312	0.12042
14	2021	Equity Bank Kenya Ltd	0.188035	13.6847	0.011578	0.48118	0.046776	11.2455	0.084297
15	2016	Family Bank Ltd.	0.208	11.1481	0.050648	0.929606	0.009117	9.31771	0.131158
15	2017	Family Bank Ltd.	0.199	11.1426	0.04553	1.21169	-0.01986	8.86048	0.201969
15	2018	Family Bank Ltd.	0.195214	11.1111	0.058147	0.937972	0.006275	8.79848	0.173064
15	2019	Family Bank Ltd.	0.186861	11.2754	0.061142	0.823908	0.017148	8.8723	0.151575
15	2020	Family Bank Ltd.	0.178592	11.4141	0.069035	0.851513	0.014637	9.09307	0.148801
15	2021	Family Bank Ltd.	0.208883	11.6234	0.115928	0.701513	0.02816	9.28441	0.150362
16	2016	First Community Bank Ltd	0.14	9.61327	0.067288	1.02858	-0.00274	7.14779	0.323076
16	2017	First Community Bank Ltd	0.153	9.76192	0.040811	0.83168	0.012442	6.95172	0.400091
16	2018	First Community Bank Ltd	0.091142	9.79146	0.088369	1.23601	-0.01557	6.89541	0.462071
16	2019	First Community Bank Ltd	0.080963	9.83963	0.121199	0.844922	0.009885	6.90854	0.39711
16	2020	First Community Bank Ltd	0.092763	9.99639	0.044555	0.815513	0.010844	6.92306	0.360829
16	2021	First Community Bank Ltd	0.088885	10.1146	0.034296	0.728154	0.024371	7.45894	0.288228
17	2016	Guaranty Trust Bank Ltd	0.271	10.2962	0.192915	0.817813	0.022249	6.37373	0.07408
17	2017	Guaranty Trust Bank Ltd	0.269	10.2266	0.10538	0.871255	0.008723	7.7607	0.103376
17	2018	Guaranty Trust Bank Ltd	0.269759	10.1395	0.071313	0.822436	0.012126	7.71882	0.189327
17	2019	Guaranty Trust Bank Ltd	0.262635	10.2779	0.047996	0.733	0.01689	7.68299	0.18471
17	2020	Guaranty Trust Bank Ltd	0.272819	10.3503	0.057976	0.753709	0.015767	7.76738	0.208031
17	2021	Guaranty Trust Bank Ltd	0.253853	10.4429	0.119816	0.633523	0.026297	7.90879	0.137901
18	2016	Guardian Bank Limited	0.196	9.59594	0.114176	0.813369	0.020537	7.5888	0.081945
18	2017	Guardian Bank Limited	0.202	9.66796	0.094218	0.763849	0.014428	7.4257	0.1089
18	2018	Guardian Bank Limited	0.227466	9.6919	0.108248	0.673089	0.021503	7.48505	0.098816
18	2019	Guardian Bank Limited	0.222006	9.70421	0.120355	0.731832	0.01529	7.39333	0.095431

18	2020	Guardian Bank Limited	0.235578	9.73258	0.106131	0.915169	0.004568	7.38879	0.127703
18	2021	Guardian Bank Limited	0.263953	9.78335	0.179287	0.859199	0.007612	7.39661	0.163992
19	2016	Gulf African Bank Ltd	0.187	10.2094	0.097434	0.692027	0.027766	7.83024	0.096908
19	2017	Gulf African Bank Ltd	0.162	10.3519	0.094088	0.903461	0.008111	7.82868	0.097399
19	2018	Gulf African Bank Ltd	0.186614	10.4141	0.075331	0.901772	0.008768	7.9584	0.108909
19	2019	Gulf African Bank Ltd	0.171101	10.4666	0.044993	0.919223	0.006208	7.92291	0.147001
19	2020	Gulf African Bank Ltd	0.189794	10.5362	0.037817	0.80596	0.014846	7.96187	0.17568
19	2021	Gulf African Bank Ltd	0.190879	10.5368	0.117777	0.766618	0.018233	7.97685	0.161122
20	2016	Habib Bank A.G Zurich	0.323	9.74291	0.071258	0.408874	0.036517	7.09929	0.029472
20	2017	Habib Bank A.G Zurich	0.271	9.83671	0.061357	0.585613	0.021862	7.47534	0.104225
20	2018	Habib Bank A.G Zurich	0.246332	9.97677	0.041024	0.669311	0.016683	7.54674	0.090064
20	2019	Habib Bank A.G Zurich	0.272905	10.1195	0.032608	0.679212	0.01552	7.65297	0.112429
20	2020	Habib Bank A.G Zurich	0.266104	10.2114	0.039583	0.640992	0.016574	7.70109	0.122097
20	2021	Habib Bank A.G Zurich	0.344866	10.2596	0.081154	0.606462	0.018982	7.76491	0.116213
21	2016	I & M Bank Ltd	0.181	12.0083	0.046061	0.467943	0.052713	9.9035	0.048628
21	2017	I & M Bank Ltd	0.186	12.1224	0.039547	0.546338	0.040858	9.88342	0.139145
21	2018	I & M Bank Ltd	0.179194	12.3422	0.049136	0.511396	0.038075	9.91958	0.146191
21	2019	I & M Bank Ltd	0.215617	12.4461	0.046979	0.352159	0.047246	9.95774	0.123024
21	2020	I & M Bank Ltd	0.220269	12.5552	0.011613	0.444668	0.036284	9.97008	0.125591
21	2021	I & M Bank Ltd	0.213845	12.6372	0.45272	0.520305	0.034395	10.1111	0.10754
22	2016	KCB Bank Kenya Ltd	0.199	13.1319	0.046728	0.510485	0.056425	10.9363	0.075953
22	2017	KCB Bank Kenya Ltd	0.161	13.2279	0.040445	0.549653	0.049443	10.9498	0.083033
22	2018	KCB Bank Kenya Ltd	0.177829	13.3403	0.105388	0.487445	0.050481	11.1016	0.069095
22	2019	KCB Bank Kenya Ltd	0.175088	13.4214	0.155049	0.456875	0.049212	11.2165	0.074288
22	2020	KCB Bank Kenya Ltd	0.193575	13.5389	0.10976	0.444222	0.031102	11.4748	0.122624
22	2021	KCB Bank Kenya Ltd	0.204628	13.6248	0.085544	0.437547	0.049012	11.6512	0.157746
23	2016	Kingdom Bank Ltd	0.201	9.66294	0.008455	2.27273	-0.03116	7.01392	0.203963
23	2017	Kingdom Bank Ltd	0.193	9.46118	0.013938	2.57039	-0.0593	7.22998	0.212106
23	2018	Kingdom Bank Ltd	0.225102	9.21083	0.002061	1.68535	-0.03832	7.10917	0.696225
23	2019	Kingdom Bank Ltd	0.083273	9.05772	0.004191	9.63041	-0.13319	6.50842	0.565019
23	2020	Kingdom Bank Ltd	0.138145	10.3291	0.066687	0.912036	-0.00405	7.48481	0.761985
23	2021	Kingdom Bank Ltd	0.148909	10.3638	0.032702	0.817438	0.016156	8.05777	0.744549
24	2016	Middle East Bank (K) Ltd	0.316	8.56293	0.077305	1.37586	-0.0193	6.37438	0.297136
24	2017	Middle East Bank (K) Ltd	0.426	8.54111	0.207346	1.15939	-0.00801	6.1214	0.443553
24	2018	Middle East Bank (K) Ltd	0.309335	8.58688	0.063833	0.998442	0.000095	6.21617	0.400457
24	2019	Middle East Bank (K) Ltd	0.311901	9.04385	0.064799	0.88678	0.007043	6.48111	0.141394
24	2020	Middle East Bank (K) Ltd	0.279341	9.30765	0.005995	0.812401	0.009526	6.81183	0.103417
24	2021	Middle East Bank (K) Ltd	0.26014	9.32242	0.025318	0.776308	0.013499	6.93149	0.078821
25	2016	M-Oriental Commercial Bank Ltd	0.387	9.20231	0.114567	0.9519	0.003629	7.12154	0.120411
25	2017	M-Oriental Commercial Bank Ltd	0.339	9.26644	0.130589	0.853791	0.010967	7.11276	0.104508

25	2018	M-Oriental Commercial Bank Ltd	0.236768	9.26056	0.162748	0.849039	0.010015	7.06828	0.096408
25	2019	M-Oriental Commercial Bank Ltd	0.344217	9.42495	0.11534	0.898163	0.0052	7.01905	0.189269
25	2020	M-Oriental Commercial Bank Ltd	0.304637	9.47155	0.079584	0.948993	0.003312	7.17461	0.234048
25	2021	M-Oriental Commercial Bank Ltd	0.297028	9.52201	0.125429	0.911873	0.004906	7.17532	0.268164
26	2016	National Bank of Kenya Ltd	0.119	11.6537	0.053521	0.985246	0.001407	9.41961	0.437026
26	2017	National Bank of Kenya Ltd	0.054	11.6077	0.058102	0.91846	0.006731	9.20656	0.405822
26	2018	National Bank of Kenya Ltd	0.036858	11.6539	0.044512	0.927664	0.005102	9.0952	0.475795
26	2019	National Bank of Kenya Ltd	0.114987	11.6265	0.116882	1.09842	-0.00733	9.10813	0.414902
26	2020	National Bank of Kenya Ltd	0.103042	11.7507	0.037797	0.964855	0.002468	9.18302	0.353572
26	2021	National Bank of Kenya Ltd	0.142727	11.8951	0.072787	0.862827	0.009465	9.41245	0.334974
27	2016	NCBA) Bank Kenya PLC	0.184	12.259	0.046924	0.47861	0.036007	9.53626	0.070897
27	2017	NCBA) Bank Kenya PLC	0.173	12.3438	0.048627	0.570934	0.031321	9.65778	0.072853
27	2018	NCBA) Bank Kenya PLC	0.010499	12.3559	0.054876	0.579328	0.034231	9.75042	0.078388
27	2019	NCBA) Bank Kenya PLC	0.185768	13.0496	0.065732	0.645865	0.019983	10.0344	0.124863
27	2020	NCBA) Bank Kenya PLC	0.179179	13.1054	0.057547	0.831335	0.014147	10.5834	0.138603
27	2021	NCBA) Bank Kenya PLC	0.183799	13.2117	0.072702	0.615138	0.030765	10.6501	0.160011
28	2016	Paramount Bank Ltd	0.274	9.15133	0.085758	0.781179	0.011138	7.07511	0.12462
28	2017	Paramount Bank Ltd	0.274	9.16335	0.128195	0.796006	0.010062	6.92456	0.122616
28	2018	Paramount Bank Ltd	0.28535	9.19902	0.138974	0.685645	0.015251	6.90504	0.173202
28	2019	Paramount Bank Ltd	0.300908	9.25372	0.091917	0.816255	0.0082	6.94665	0.175979
28	2020	Paramount Bank Ltd	0.24731	9.33944	0.076816	0.82572	0.008525	7.01549	0.170747
28	2021	Paramount Bank Ltd	0.279423	9.42932	0.260978	0.754254	0.012291	7.15296	0.191328
29	2016	Prime Bank Ltd	0.222	11.0873	0.043858	0.485928	0.035753	8.93312	0.046179
29	2017	Prime Bank Ltd	0.225	11.2442	0.07203	0.573738	0.025864	8.9052	0.056636
29	2018	Prime Bank Ltd	0.372927	11.4982	0.115652	0.550926	0.021195	8.98812	0.073871
29	2019	Prime Bank Ltd	0.413648	11.5971	0.064715	0.550637	0.022581	9.13093	0.116999
29	2020	Prime Bank Ltd	0.392564	11.6631	0.053634	0.678494	0.015912	9.17573	0.108643
29	2021	Prime Bank Ltd	0.41568	11.7479	0.056595	0.561338	0.022952	9.2731	0.109275
30	2016	SBM Bank Kenya Ltd	0.128	9.20057	0.062454	4.30007	-0.22896	7.41832	0.945491
30	2017	SBM Bank Kenya Ltd	0.164	9.37118	0.281197	2.25844	-0.03074	6.45758	0.586377
30	2018	SBM Bank Kenya Ltd	0.242537	11.1655	0.163732	0.47767	0.013528	7.83144	0.691086
30	2019	SBM Bank Kenya Ltd	0.231175	11.1916	0.129991	0.753812	0.016271	8.81507	0.550209
30	2020	SBM Bank Kenya Ltd	0.171763	11.2796	0.097231	0.955466	0.007791	8.90267	0.441377
30	2021	SBM Bank Kenya Ltd	0.163513	11.314	0.070459	0.986381	0.00277	8.94727	0.343509
31	2016	Sidian Bank Ltd	0.232	9.94631	0.115085	0.975215	0.00297	8.03773	0.169727
31	2017	Sidian Bank Ltd	0.165	9.86796	0.153713	1.37152	-0.0328	7.60783	0.210543
31	2018	Sidian Bank Ltd	0.144047	10.1397	0.084946	1.26665	-0.02219	7.65842	0.208534
31	2019	Sidian Bank Ltd	0.179303	10.1831	0.135261	0.972331	0.002438	7.66546	0.205604

31	2020	Sidian Bank Ltd	0.165008	10.4193	0.072305	0.952806	0.003104	7.8189	0.114508
31	2021	Sidian Bank Ltd	0.186127	10.6313	0.641646	0.776192	0.016904	8.17265	0.118318
32	2016	Spire Bank Limited	0.163	9.53257	0.087734	2.14928	-0.07014	7.27184	0.158913
32	2017	Spire Bank Limited	0.127	9.31902	0.029816	3.86392	-0.14137	6.9768	0.342071
32	2018	Spire Bank Limited	-0.22003	9.12946	0.077728	2.41641	-0.03333	6.49677	0.439679
32	2019	Spire Bank Limited	-0.20597	8.83351	0.007687	5.12209	-0.0661	6.06843	0.514666
32	2020	Spire Bank Limited	-0.60544	8.53974	0.005011	-16.1973	-0.2458	4.30438	0.708388
32	2021	Spire Bank Limited	-0.10842	8.25713	0.016428	-10.4507	-0.30246	5.67874	0.759765
33	2016	Stanbic Bank Kenya Ltd	0.183	12.2303	0.057366	0.603821	0.033725	9.74763	0.05919
33	2017	Stanbic Bank Kenya Ltd	0.176	12.3859	0.042209	0.699723	0.023387	9.71671	0.076482
33	2018	Stanbic Bank Kenya Ltd	0.174474	12.5459	0.101951	0.583967	0.031315	9.84582	0.107037
33	2019	Stanbic Bank Kenya Ltd	0.183386	12.5869	0.116883	0.650066	0.02815	9.92355	0.118059
33	2020	Stanbic Bank Kenya Ltd	0.181088	12.6729	0.07011	0.71616	0.019553	9.88883	0.14178
33	2021	Stanbic Bank Kenya Ltd	0.172931	12.6736	0.074563	0.605763	0.029975	9.90971	0.111993
34	2016	Standard Chartered Bank Kenya Ltd	0.209	12.4303	0.063012	0.53263	0.051	10.1565	0.113497
34	2017	Standard Chartered Bank Kenya Ltd	0.185	12.5607	0.045083	0.641386	0.033354	10.1744	0.126401
34	2018	Standard Chartered Bank Kenya Ltd	0.194689	12.5592	0.074776	0.587301	0.040161	10.1957	0.162662
34	2019	Standard Chartered Bank Kenya Ltd	0.177255	12.6192	0.073302	0.560151	0.041983	10.133	0.138826
34	2020	Standard Chartered Bank Kenya Ltd	0.184735	12.6943	0.066059	0.737808	0.021536	10.0741	0.14627
34	2021	Standard Chartered Bank Kenya Ltd	0.17756	12.7222	0.075626	0.569885	0.036233	10.0116	0.157406
35	2016	UBA Kenya Bank Ltd	0.387	8.6307	0.074306	0.915379	0.008927	6.26129	0.022066
35	2017	UBA Kenya Bank Ltd	0.388	8.78033	0.143826	0.976996	0.002152	6.33875	0.045935
35	2018	UBA Kenya Bank Ltd	0.331562	9.6377	0.214118	0.966371	0.001543	7.11944	0.127561
35	2019	UBA Kenya Bank Ltd	0.253674	9.68585	0.024134	0.887975	0.006563	7.34517	0.229888
35	2020	UBA Kenya Bank Ltd	0.304201	9.83858	0.070705	2.04753	0.002988	7.3415	0.407489
35	2021	UBA Kenya Bank Ltd	0.125745	9.51768	0.361295	-18.1615	-0.10163	6.93493	0.47792
36	2016	Victoria Commercial Bank Limited	0.255	10.017	0.085325	0.442493	0.035531	7.80417	0.001308
36	2017	Victoria Commercial Bank Limited	0.227	10.1653	0.093621	0.47565	0.032673	7.90533	0.0009
36	2018	Victoria Commercial Bank Limited	0.210946	10.384	0.113762	0.587344	0.017475	8.07052	0.030513
36	2019	Victoria Commercial Bank Limited	0.201506	10.4933	0.102827	0.589082	0.018534	8.21875	0.049059
36	2020	Victoria Commercial Bank Limited	0.187904	10.5424	0.094128	0.661645	0.012668	8.22227	0.065993
36	2021	Victoria Commercial Bank Limited	0.165898	10.6798	0.073675	0.660934	0.012008	8.34567	0.138762

Appendix III: STATA Output

Variable	VIF	1/VIF
nii	26.00	0.038456
size	25.15	0.039759
roa	2.11	0.473763
aq	1.69	0.592987
maq	1.18	0.847581
lq	1.04	0.958475
Mean VIF	9.53	

Variable	VIF	1/VIF
roa	2.11	0.474661
aq	1.64	0.610429
size	1.43	0.700365
maq	1.13	0.887814
lq	1.04	0.961836
Mean VIF	1.47	

Appendix IV: Raw Data

Year	Bank	PBT(Ksh.Mil.)	Assets (Ksh.Mil)	Equity (Ksh.Mil)	Gross L. (ksh.Mil)	Gross NPL (Ksh.Mil)	Total Capital (ksh.Mil)	RWA(Ksh.Mil)
2016	Absa Bank Kenya Plc	10,440	259,498	42,095	176,349	11,472	42,746	239,299
2017	Absa Bank Kenya Plc	10,006	271,682	43,559	177,224	12,615	43,934	243,728
2018	Absa Bank Kenya Plc	10,250	325,363	43,393	186,984	13,910	42,880	261,752
2019	Absa Bank Kenya Plc	11,857	374,109	47,015	205,304	13,519	46,434	277,813
2020	Absa Bank Kenya Plc	8,300	377,936	44,969	229,677	17,099	51,909	297,314
2021	Absa Bank Kenya Plc	14,725	428,746	54,353	256,465	19,817	56,357	328,712
2016	Access Bank Plc	160	10,465	2,073	7,026	891	2,073	9,974
2017	Access Bank Plc	54	10,295	2,132	7,365	1,595	2,010	6,663
2018	Access Bank Plc	(98)	10,236	1,929	7,646	1,850	1,794	9,136
2019	Access Bank Plc	(56)	9,318	11,705	7,313	2,196	1,818	9,020
2020	Access Bank Plc	(2,010)	10,147	1,413	3,481	159	1,413	6,699
2021	Access Bank Plc	92	13,211	1,549	3,128	202	1,549	7,499
2016	African Banking Corporation Ltd	222	22,422	2,997	15,022	2,840	2,969	18,530
2017	African Banking Corporation Ltd	203	24,804	3,160	16,371	3,535	2,906	19,239
2018	African Banking Corporation Ltd	158	27,213	3,557	17,248	4,232	3,073	19,408
2019	African Banking Corporation Ltd	164	28,680	92,608	20,115	3,557	3,076	20,005
2020	African Banking Corporation Ltd	147	32,643	3,816	21,961	3,425	3,208	21,095
2021	African Banking Corporation Ltd	126	36,341	3,920	23,654	4,665	3,313	20,448
2016	Bank of Africa (K) Ltd	(16)	55,996	8,418	37,480	10,794	7,637	47,248
2017	Bank of Africa (K) Ltd	35	54,191	8,468	33,589	10,571	6,986	44,275
2018	Bank of Africa (K) Ltd	210	49,081	6,736	26,255	9,509	4,959	30,953
2019	Bank of Africa (K) Ltd	(2,930)	43,996	69,914	22,546	8,998	2,657	24,546
2020	Bank of Africa (K) Ltd	(680)	44,917	5,419	21,850	8,689	3,484	21,331
2021	Bank of Africa (K) Ltd	290	43,350	5,621	26,337	8,352	3,755	21,403
2016	Bank of Baroda (K) Limited	3,876	82,907	14,225	38,089	3,392	13,992	45,823
2017	Bank of Baroda (K) Limited	5,053	96,132	17,900	43,943	2,666	16,909	52,365
2018	Bank of Baroda (K) Limited	5,159	123,014	20,415	43,439	3,903	20,201	58,281

2019	Bank of Baroda (K) Limited	5,466	143,311	77,088	49,335	4,126	22,859	69,828
2020	Bank of Baroda (K) Limited	5,791	166,313	26,677	51,151	6,342	26,670	86,842
2021	Bank of Baroda (K) Limited	6,683	180,381	28,832	58,165	6,088	28,679	95,644
2016	Bank of India	2,185	47,815	9,536	19,354	272	8,971	19,615
2017	Bank of India	2,675	56,631	11,625	20,771	435	11,069	20,508
2018	Bank of India	2,448	62,689	13,191	19,153	1,347	12,643	28,787
2019	Bank of India	2,799	62,543	47,222	13,608	1,212	14,993	30,964
2020	Bank of India	2,733	75,129	17,853	20,980	996	17,322	35,693
2021	Bank of India	3,452	86,867	20,708	22,552	627	20,184	38,666
2016	Citibank N.A. Kenya	6,033	103,324	19,629	28,242	805	19,196	72,808
2017	Citibank N.A. Kenya	6,373	98,232	20,177	38,080	1,724	19,763	77,348
2018	Citibank N.A. Kenya	5,643	85,639	19,410	27,255	819	18,817	68,087
2019	Citibank N.A. Kenya	5,647	96,570	69,416	27,068	1,116	18,597	68,494
2020	Citibank N.A. Kenya	5,480	106,454	22,134	39,726	1,120	18,515	82,243
2021	Citibank N.A. Kenya	5,839	130,940	22,536	53,765	1,020	18,546	98,723
2016	Co - operative Bank of Kenya Ltd	18,024	349,998	60,046	241,395	11,273	72,770	319,615
2017	Co - operative Bank of Kenya Ltd	16,502	382,830	68,227	252,362	18,714	81,048	357,310
2018	Co - operative Bank of Kenya Ltd	17,587	408,304	68,319	257,566	28,953	28,732	160,963
2019	Co - operative Bank of Kenya Ltd	20,326	449,616	52,001	281,516	31,156	64,712	410,347
2020	Co - operative Bank of Kenya Ltd	16,961	496,823	85,597	307,324	51,781	77,446	455,847
2021	Co - operative Bank of Kenya Ltd	21,325	540,387	94,920	334,274	43,312	85,952	502,186
2016	Consolidated Bank of Kenya Limited	(277)	13,918	1,403	10,317	2,038	1,001	12,669
2017	Consolidated Bank of Kenya Limited	(439)	13,456	1,068	9,882	2,481	595	11,686
2018	Consolidated Bank of Kenya Limited	(352)	12,887	925	10,027	2,539	109,430	367,430
2019	Consolidated Bank of Kenya Limited	(517)	11,866	19,047	8,929	2,632	1,369	10,126
2020	Consolidated Bank of Kenya Limited	(262)	12,886	1,837	10,130	2,436	1,076	11,740
2021	Consolidated Bank of Kenya Limited	(286)	14,283	1,533	9,858	2,712	699	13,179
2016	Credit Bank Ltd	158	12,202	2,460	8,361	676	2,468	10,801
2017	Credit Bank Ltd	179	14,465	2,665	10,171	877	2,644	16,679
2018	Credit Bank Ltd	332	17,805	2,863	13,440	1,113	2,721	18,756

2019	Credit Bank Ltd	300	21,541	22,943	15,797	1,592	3,002	20,069
2020	Credit Bank Ltd	8	23,145	3,218	17,512	2,017	3,220	22,156
2021	Credit Bank Ltd	205	25,893	3,328	17,784	5,022	3,360	21,234
2016	Development Bank of Kenya Ltd	95	16,418	2,903	10,083	2,594	2,019	8,047
2017	Development Bank of Kenya Ltd	58	16,320	2,930	10,710	2,310	1,898	8,060
2018	Development Bank of Kenya Ltd	169	15,323	2,871	10,031	2,879	2,076	8,936
2019	Development Bank of Kenya Ltd	1,137	15,358	15,532	9,801	3,341	2,952	9,382
2020	Development Bank of Kenya Ltd	19	17,222	3,823	10,149	3,420	2,695	12,114
2021	Development Bank of Kenya Ltd	65	17,289	3,823	10,218	2,995	2,584	13,232
2016	Diamond Trust Bank Kenya Limited	8,876	244,124	36,432	141,702	5,520	33,904	183,223
2017	Diamond Trust Bank Kenya Limited	8,228	270,082	43,004	156,843	11,901	38,790	204,039
2018	Diamond Trust Bank Kenya Limited	9,265	281,516	47,713	152,287	11,036	45,102	213,678
2019	Diamond Trust Bank Kenya Limited	9,279	287,251	24,455	155,307	12,892	48,907	233,854
2020	Diamond Trust Bank Kenya Limited	3,942	312,189	54,032	165,948	19,747	51,543	229,366
2021	Diamond Trust Bank Kenya Limited	4,415	326,377	57,567	171,866	27,151	53,031	250,695
2016	Ecobank Kenya Ltd	(2,889)	47,124	7,307	27,393	5,359	7,606	39,119
2017	Ecobank Kenya Ltd	(1,434)	53,456	6,439	21,456	8,287	5,995	37,495
2018	Ecobank Kenya Ltd	136	54,464	6,408	14,733	3,192	5,738	34,583
2019	Ecobank Kenya Ltd	243	75,378	7,877	24,118	4,783	6,918	42,533
2020	Ecobank Kenya Ltd	6	94,428	7,070	26,884	4,377	7,070	44,549
2021	Ecobank Kenya Ltd	612	103,388	6,426	27,223	4,389	7,669	44,481
2016	Equity Bank Kenya Ltd	22,778	379,749	52,341	221,039	15,457	55,095	356,088
2017	Equity Bank Kenya Ltd	23,086	406,402	61,906	221,698	14,758	61,902	374,209
2018	Equity Bank Kenya Ltd	24,382	438,509	60,587	231,026	17,064	55,864	400,289
2019	Equity Bank Kenya Ltd	25,974	507,525	3,950	290,564	26,185	82,739	476,760
2020	Equity Bank Kenya Ltd	14,207	667,650	86,697	355,630	42,825	92,118	566,959
2021	Equity Bank Kenya Ltd	41,042	877,415	106,400	420,774	35,470	132,496	704,636
2016	Family Bank Ltd.	633	69,432	12,619	53,485	7,015	14,450	69,534
2017	Family Bank Ltd.	(1,371)	69,051	11,608	46,928	9,478	13,147	66,207
2018	Family Bank Ltd.	420	66,910	11,426	47,023	8,138	12,725	65,186

2019	Family Bank Ltd.	1,352	78,857	6,356	54,389	8,244	13,263	70,978
2020	Family Bank Ltd.	1,326	90,591	13,162	63,111	9,391	13,363	74,824
2021	Family Bank Ltd.	3,145	111,683	15,164	73,529	11,056	17,354	83,080
2016	First Community Bank Ltd	(41)	14,962	1,557	11,926	3,853	1,969	14,071
2017	First Community Bank Ltd	216	17,360	1,709	10,995	4,399	2,021	13,173
2018	First Community Bank Ltd	(278)	17,880	1,271	10,691	4,940	1,078	11,829
2019	First Community Bank Ltd	185	18,763	8,808	11,833	4,699	1,130	13,963
2020	First Community Bank Ltd	238	21,947	2,051	14,572	5,258	1,619	17,453
2021	First Community Bank Ltd	602	24,701	2,467	19,037	5,487	1,912	21,511
2016	Guaranty Trust Bank Ltd	659	29,619	8,366	13,418	994	5,580	20,599
2017	Guaranty Trust Bank Ltd	241	27,628	8,609	13,746	1,421	5,354	19,923
2018	Guaranty Trust Bank Ltd	307	25,323	8,453	13,342	2,526	5,074	18,811
2019	Guaranty Trust Bank Ltd	491	29,082	3,077	14,872	2,747	5,422	20,644
2020	Guaranty Trust Bank Ltd	493	31,267	9,189	15,714	3,269	5,673	20,794
2021	Guaranty Trust Bank Ltd	902	34,301	9,747	18,332	2,528	5,896	23,226
2016	Guardian Bank Limited	302	14,705	2,215	9,604	787	2,215	11,288
2017	Guardian Bank Limited	228	15,803	2,375	10,303	1,122	2,375	11,746
2018	Guardian Bank Limited	348	16,186	2,557	9,715	960	2,557	11,242
2019	Guardian Bank Limited	251	16,386	3,000	9,892	944	2,741	12,346
2020	Guardian Bank Limited	77	16,858	2,834	9,248	1,181	2,834	12,030
2021	Guardian Bank Limited	135	17,736	2,989	7,665	1,257	2,989	11,324
2016	Gulf African Bank Ltd	754	27,156	4,376	16,686	1,617	4,266	22,788
2017	Gulf African Bank Ltd	254	31,316	4,419	20,144	1,962	4,836	29,847
2018	Gulf African Bank Ltd	292	33,326	4,468	23,616	2,572	6,127	32,835
2019	Gulf African Bank Ltd	218	35,123	2,741	24,578	3,613	5,877	34,347
2020	Gulf African Bank Ltd	559	37,653	5,029	22,928	4,028	6,055	31,903
2021	Gulf African Bank Ltd	687	37,678	5,473	22,486	3,623	5,910	30,962
2016	Habib Bank A.G Zurich	622	17,033	2,965	5,361	158	2,965	9,179
2017	Habib Bank A.G Zurich	409	18,708	2,842	5,680	592	2,842	10,505
2018	Habib Bank A.G Zurich	359	21,521	3,039	6,451	581	2,927	11,881

2019	Habib Bank A.G Zurich	385	24,823	6,568	7,000	787	2,929	10,732
2020	Habib Bank A.G Zurich	451	27,212	3,204	6,847	836	2,995	11,255
2021	Habib Bank A.G Zurich	542	28,554	3,327	6,359	739	3,070	8,902
2016	I & M Bank Ltd	8,651	164,116	31,305	104,302	5,072	26,934	148,414
2017	I & M Bank Ltd	7,516	183,953	35,024	126,983	17,669	32,227	173,455
2018	I & M Bank Ltd	8,725	229,161	38,339	144,434	21,115	35,785	199,700
2019	I & M Bank Ltd	12,012	254,252	4,635	152,807	18,799	45,276	209,981
2020	I & M Bank Ltd	10,289	283,569	52,324	160,665	20,178	49,335	223,976
2021	I & M Bank Ltd	10,587	307,802	51,920	172,615	18,563	52,850	247,142
2016	KCB Bank Kenya Ltd	28,482	504,778	80,990	373,031	28,333	85,691	430,839
2017	KCB Bank Kenya Ltd	27,472	555,630	88,991	411,666	34,182	78,020	483,986
2018	KCB Bank Kenya Ltd	31,385	621,723	97,789	434,361	30,012	95,596	537,573
2019	KCB Bank Kenya Ltd	33,184	674,302	3,689	468,258	34,786	101,067	577,236
2020	KCB Bank Kenya Ltd	23,586	758,345	111,271	544,837	66,810	126,674	654,393
2021	KCB Bank Kenya Ltd	40,503	826,395	123,823	584,441	92,193	138,433	676,511
2016	Kingdom Bank Ltd	(490)	15,724	3,590	10,497	2,141	2,789	13,888
2017	Kingdom Bank Ltd	(762)	12,851	3,454	9,929	2,106	2,349	12,156
2018	Kingdom Bank Ltd	(383)	10,005	1,769	9,112	6,344	1,259	5,593
2019	Kingdom Bank Ltd	(1,143)	8,585	1,462	10,766	6,083	679	8,148
2020	Kingdom Bank Ltd	(124)	30,612	1,300	8,907	6,787	1,026	7,427
2021	Kingdom Bank Ltd	512	31,691	1,884	8,072	6,010	1,051	7,058
2016	Middle East Bank (K) Ltd	(101)	5,234	1,192	4,015	1,193	1,186	3,749
2017	Middle East Bank (K) Ltd	(41)	5,121	1,162	3,242	1,438	1,157	2,717
2018	Middle East Bank (K) Ltd	1	5,361	1,158	3,064	1,227	2,683	8,675
2019	Middle East Bank (K) Ltd	60	8,466	1,778	6,153	870	1,094	3,507
2020	Middle East Bank (K) Ltd	105	11,022	1,274	7,639	790	1,221	4,371
2021	Middle East Bank (K) Ltd	151	11,186	1,400	6,648	524	1,334	5,128
2016	M-Oriental Commercial Bank Ltd	36	9,920	2,931	7,109	856	2,788	7,207
2017	M-Oriental Commercial Bank Ltd	116	10,577	3,028	7,741	809	2,887	8,506

2018	M-Oriental Commercial Bank Ltd	105	10,515	3,065	8,018	773	1,019	4,303
2019	M-Oriental Commercial Bank Ltd	64	12,394	3,043	7,455	1,411	2,705	7,859
2020	M-Oriental Commercial Bank Ltd	43	12,985	3,071	7,742	1,812	2,654	8,712
2021	M-Oriental Commercial Bank Ltd	67	13,657	3,118	7,212	1,934	2,708	9,117
2016	National Bank of Kenya Ltd	162	115,114	10,996	68,616	29,987	10,501	88,325
2017	National Bank of Kenya Ltd	740	109,942	7,048	68,153	27,658	4,771	87,998
2018	National Bank of Kenya Ltd	588	115,143	6,936	66,123	31,461	3,419	92,766
2019	National Bank of Kenya Ltd	(821)	112,029	4,018	60,677	25,175	7,734	67,262
2020	National Bank of Kenya Ltd	313	126,842	11,936	74,774	26,438	7,835	76,037
2021	National Bank of Kenya Ltd	1,387	146,543	16,365	79,236	26,542	11,605	81,309
2016	NCBA) Bank Kenya PLC	7,593	210,878	27,470	105,082	7,450	25,800	139,840
2017	NCBA) Bank Kenya PLC	7,189	229,525	31,571	107,038	7,798	26,130	150,898
2018	NCBA) Bank Kenya PLC	7,952	232,317	33,775	118,271	9,271	117	11,107
2019	NCBA) Bank Kenya PLC	9,290	464,891	38,940	244,395	30,516	65,182	350,880
2020	NCBA) Bank Kenya PLC	6,955	491,614	72,028	259,698	35,995	61,233	341,742
2021	NCBA) Bank Kenya PLC	16,820	546,734	78,643	255,664	40,909	64,658	351,787
2016	Paramount Bank Ltd	105	9,427	1,644	6,243	778	1,638	5,979
2017	Paramount Bank Ltd	96	9,541	1,760	6,345	778	1,638	5,974
2018	Paramount Bank Ltd	151	9,887	1,687	6,172	1,069	1,575	5,518
2019	Paramount Bank Ltd	86	10,443	1,156	7,177	1,263	1,660	5,518
2020	Paramount Bank Ltd	97	11,378	1,911	7,883	1,346	1,747	7,064
2021	Paramount Bank Ltd	153	12,448	2,059	7,934	1,518	1,878	6,721
2016	Prime Bank Ltd	2,336	65,338	10,834	40,170	1,855	10,765	48,576
2017	Prime Bank Ltd	1,977	76,438	14,338	39,763	2,252	11,796	52,478
2018	Prime Bank Ltd	2,088	98,534	23,039	38,188	2,821	20,074	53,829
2019	Prime Bank Ltd	2,457	108,786	1,818	38,932	4,555	22,034	53,267
2020	Prime Bank Ltd	1,849	116,204	24,902	44,531	4,838	22,912	58,365
2021	Prime Bank Ltd	2,903	126,482	28,111	47,577	5,199	24,639	59,274

2016	SBM Bank Kenya Ltd	(2,267)	9,903	(741,749)	4,876	4,611	(787)	6,142
2017	SBM Bank Kenya Ltd	(361)	11,745	1,607	6,680	3,917	1,041	6,331
2018	SBM Bank Kenya Ltd	956	70,648	6,938	23,602	16,311	6,952	28,665
2019	SBM Bank Kenya Ltd	1,180	72,519	1,040	27,226	14,980	7,856	33,983
2020	SBM Bank Kenya Ltd	617	79,190	8,871	36,760	16,225	7,932	46,180
2021	SBM Bank Kenya Ltd	227	81,958	8,596	37,408	12,850	8,053	49,250
2016	Sidian Bank Ltd	62	20,875	3,869	14,488	2,459	3,817	16,420
2017	Sidian Bank Ltd	(633)	19,302	3,447	12,330	2,596	3,354	20,377
2018	Sidian Bank Ltd	(562)	25,329	4,037	14,108	2,942	3,892	27,021
2019	Sidian Bank Ltd	64	26,452	(552)	15,846	3,258	4,927	27,480
2020	Sidian Bank Ltd	104	33,500	4,080	20,409	2,337	5,123	31,047
2021	Sidian Bank Ltd	700	41,410	4,746	23,834	2,820	6,491	34,874
2016	Spire Bank Limited	(968)	13,802	1,817	8,319	1,322	1,895	11,646
2017	Spire Bank Limited	(1,576)	11,148	1,188	6,867	2,349	1,206	9,537
2018	Spire Bank Limited	(307)	9,223	(1,030)	6,109	2,686	(1,562)	7,099
2019	Spire Bank Limited	(453)	6,860	2,000	5,114	2,632	(1,331)	6,464
2020	Spire Bank Limited	(1,257)	5,114	(1,820)	3,827	2,711	(2,581)	4,263
2021	Spire Bank Limited	(1,166)	3,855	413	3,405	2,587	(286)	2,638
2016	Stanbic Bank Kenya Ltd	6,910	204,895	30,238	118,483	7,013	32,876	179,751
2017	Stanbic Bank Kenya Ltd	5,599	239,408	33,051	135,443	10,359	36,208	206,090
2018	Stanbic Bank Kenya Ltd	8,798	280,953	34,591	155,498	16,644	39,657	227,294
2019	Stanbic Bank Kenya Ltd	8,240	292,705	44,079	163,859	19,345	43,687	238,222
2020	Stanbic Bank Kenya Ltd	6,237	318,986	41,857	176,597	25,038	46,444	256,472
2021	Stanbic Bank Kenya Ltd	9,568	319,199	46,512	200,941	22,504	49,835	288,178
2016	Standard Chartered Bank Kenya Ltd	12,764	250,274	43,905	132,497	15,038	42,104	201,321
2017	Standard Chartered Bank Kenya Ltd	9,510	285,125	44,584	139,406	17,621	42,242	228,112
2018	Standard Chartered Bank Kenya Ltd	11,434	284,691	45,336	133,166	21,661	41,777	214,582
2019	Standard Chartered Bank Kenya Ltd	12,691	302,296	2,009	144,483	20,058	43,038	242,803
2020	Standard Chartered Bank Kenya Ltd	7,018	325,873	50,219	152,711	22,337	45,676	247,251
2021	Standard Chartered Bank Kenya Ltd	12,142	335,111	52,479	147,917	23,283	46,670	262,840

2016	UBA Kenya Bank Ltd	50	5,601	2,143	3,127	69	2,143	5,541
2017	UBA Kenya Bank Ltd	14	6,505	2,162	3,309	152	2,162	5,575
2018	UBA Kenya Bank Ltd	24	15,332	2,174	3,465	442	2,174	6,557
2019	UBA Kenya Bank Ltd	106	16,088	304	3,841	883	2,242	8,837
2020	UBA Kenya Bank Ltd	56	18,743	2,257	3,178	1,295	2,259	7,426
2021	UBA Kenya Bank Ltd	(1,382)	13,598	823	2,808	1,342	823	6,545
2016	Victoria Commercial Bank Limited	796	22,403	5,060	15,293	20	4,988	19,599
2017	Victoria Commercial Bank Limited	849	25,985	5,612	18,887	17	5,517	24,265
2018	Victoria Commercial Bank Limited	565	32,337	5,963	22,810	696	6,207	29,425
2019	Victoria Commercial Bank Limited	669	36,072	4,276	24,542	1,204	6,368	31,605
2020	Victoria Commercial Bank Limited	480	37,890	6,745	25,442	1,679	6,605	35,151
2021	Victoria Commercial Bank Limited	522	43,471	6,988	31,291	4,342	6,834	41,194

Year	Bank	Deposits (ksh. Mil)	Interest Income (Ksh.Mil.)	Oexp (Ksh.Mil)	OI Ksh(mil)	Cash (Ksh.Mil)
2016	Absa Bank Kenya Plc	198,515	28,121	20,752	30,453	8,345
2017	Absa Bank Kenya Plc	186,245	27,166	19,776	29,782	11,635
2018	Absa Bank Kenya Plc	207,105	29,052	20,892	31,142	17,717
2019	Absa Bank Kenya Plc	242,375	30,987	21,287	33,145	21,716
2020	Absa Bank Kenya Plc	253,630	31,394	25,286	33,586	12,431
2021	Absa Bank Kenya Plc	270,737	31,988	21,006	35,730	13,279
2016	Access Bank Plc	7,922	1,430	926	1,086	823
2017	Access Bank Plc	7,874	1,122	918	972	1,122
2018	Access Bank Plc	7,740	1,011	932	833	665
2019	Access Bank Plc	7,100	1,017	949	893	442
2020	Access Bank Plc	7,826	908	2,822	812	911
2021	Access Bank Plc	9,464	867	1,067	1,159	969
2016	African Banking Corporation Ltd	16,078	3,022	1,295	1,517	1,239
2017	African Banking Corporation Ltd	19,701	2,820	1,397	1,600	2,118
2018	African Banking Corporation Ltd	21,030	3,039	1,540	1,698	1,413
2019	African Banking Corporation Ltd	22,981	3,157	1,452	1,616	1,906
2020	African Banking Corporation Ltd	27,299	3,182	1,530	1,678	1,766
2021	African Banking Corporation Ltd	29,761	3,162	1,648	1,775	2,832
2016	Bank of Africa (K) Ltd	36,646	6,515	5,402	5,386	5,579
2017	Bank of Africa (K) Ltd	31,572	4,125	3,405	3,440	4,366

2018	Bank of Africa (K) Ltd	29,677	3,390	2,284	2,344	9,927
2019	Bank of Africa (K) Ltd	33,329	2,926	2,582	(618)	9,251
2020	Bank of Africa (K) Ltd	27,977	2,689	2,947	2,267	7,224
2021	Bank of Africa (K) Ltd	27,283	2,707	2,693	2,982	4,277
2016	Bank of Baroda (K) Limited	64,874	9,588	1,488	5,364	3,683
2017	Bank of Baroda (K) Limited	73,005	10,446	1,502	6,556	3,976
2018	Bank of Baroda (K) Limited	100,551	11,703	1,723	6,882	5,906
2019	Bank of Baroda (K) Limited	119,341	13,785	2,284	7,750	7,463
2020	Bank of Baroda (K) Limited	135,000	15,452	2,313	8,104	6,760
2021	Bank of Baroda (K) Limited	115,089	17,321	2,721	9,404	8,170
2016	Bank of India	31,852	4,422	566	2,751	1,545
2017	Bank of India	31,286	5,185	665	3,340	2,146
2018	Bank of India	39,879	5,794	922	3,370	2,060
2019	Bank of India	46,755	5,895	709	3,508	2,573
2020	Bank of India	48,874	6,163	1,016	3,749	2,107
2021	Bank of India	58,568	6,842	879	4,331	2,550
2016	Citibank N.A. Kenya	65,170	7,311	2,950	8,984	6,070
2017	Citibank N.A. Kenya	64,369	6,451	3,144	9,517	7,333
2018	Citibank N.A. Kenya	54,139	6,393	3,531	9,174	6,240
2019	Citibank N.A. Kenya	65,335	6,990	3,732	9,378	10,710
2020	Citibank N.A. Kenya	79,193	6,254	3,324	8,804	10,697
2021	Citibank N.A. Kenya	44,295	6,556	3,375	9,214	11,164
2016	Co - operative Bank of Kenya Ltd	256,796	42,096	22,987	41,011	16,338
2017	Co - operative Bank of Kenya Ltd	285,566	40,094	23,454	39,956	14,826
2018	Co - operative Bank of Kenya Ltd	303,450	42,585	23,959	41,546	20,820
2019	Co - operative Bank of Kenya Ltd	330,113	43,258	26,002	46,328	17,135
2020	Co - operative Bank of Kenya Ltd	369,430	46,613	33,839	50,800	12,904
2021	Co - operative Bank of Kenya Ltd	398,686	52,245	34,087	55,412	19,391
2016	Consolidated Bank of Kenya Limited	9,535	1,672	1,715	1,438	348
2017	Consolidated Bank of Kenya Limited	8,646	1,345	1,715	1,276	582
2018	Consolidated Bank of Kenya Limited	8,306	1,401	1,756	762	547
2019	Consolidated Bank of Kenya Limited	8,796	1,216	1,738	679	610
2020	Consolidated Bank of Kenya Limited	9,224	1,065	1,541	1,279	401
2021	Consolidated Bank of Kenya Limited	11,267	1,275	1,596	1,310	641
2016	Credit Bank Ltd	8,972	1,574	1,077	1,235	534
2017	Credit Bank Ltd	10,940	1,533	1,174	1,353	704
2018	Credit Bank Ltd	12,625	1,833	1,370	1,702	924
2019	Credit Bank Ltd	17,347	2,152	1,478	1,778	892
2020	Credit Bank Ltd	17,638	2,522	1,722	1,730	759
2021	Credit Bank Ltd	20,364	2,376	1,409	1,615	1,239
2016	Development Bank of Kenya Ltd	6,635	1,750	512	607	292

2017	Development Bank of Kenya Ltd	6,249	1,467	446	504	287
2018	Development Bank of Kenya Ltd	5,596	1,436	366	535	94
2019	Development Bank of Kenya Ltd	6,029	1,334	411	1,548	327
2020	Development Bank of Kenya Ltd	6,202	1,212	447	466	595
2021	Development Bank of Kenya Ltd	7,265	1,251	340	405	396
2016	Diamond Trust Bank Kenya Limited	170,421	24,804	7,983	17,738	14,928
2017	Diamond Trust Bank Kenya Limited	190,469	25,633	8,656	17,638	15,050
2018	Diamond Trust Bank Kenya Limited	204,831	27,042	7,995	18,003	27,364
2019	Diamond Trust Bank Kenya Limited	221,038	24,455	6,740	16,966	18,238
2020	Diamond Trust Bank Kenya Limited	207,984	22,369	12,103	17,045	14,832
2021	Diamond Trust Bank Kenya Limited	225,783	23,648	12,384	17,730	17,219
2016	Ecobank Kenya Ltd	32,239	2,571	4,176	1,287	1,437
2017	Ecobank Kenya Ltd	43,686	3,683	4,372	2,938	3,732
2018	Ecobank Kenya Ltd	43,956	2,709	2,649	2,785	3,206
2019	Ecobank Kenya Ltd	66,321	3,056	2,778	3,021	1,322
2020	Ecobank Kenya Ltd	80,233	4,063	2,929	2,935	7,557
2021	Ecobank Kenya Ltd	90,844	4,000	3,215	3,827	7,742
2016	Equity Bank Kenya Ltd	277,135	43,073	27,546	50,324	11,537
2017	Equity Bank Kenya Ltd	298,703	37,796	24,641	47,727	15,636
2018	Equity Bank Kenya Ltd	340,941	41,422	32,114	60,577	74,619
2019	Equity Bank Kenya Ltd	381,138	44,983	35,295	66,773	86,434
2020	Equity Bank Kenya Ltd	496,748	61,770	40,083	62,253	8,818
2021	Equity Bank Kenya Ltd	958,977	76,531	48,117	99,998	11,103
2016	Family Bank Ltd.	41,473	11,133	8,365	8,998	2,101
2017	Family Bank Ltd.	47,425	7,048	7,846	6,476	2,159
2018	Family Bank Ltd.	47,936	6,624	6,349	6,769	2,787
2019	Family Bank Ltd.	58,332	7,132	6,327	7,679	3,567
2020	Family Bank Ltd.	70,125	8,893	7,602	8,927	4,841
2021	Family Bank Ltd.	82,430	10,769	7,391	10,535	4,252
2016	First Community Bank Ltd	12,660	1,271	1,493	1,452	852
2017	First Community Bank Ltd	14,774	1,045	1,070	1,286	603
2018	First Community Bank Ltd	14,179	988	1,458	1,180	1,253
2019	First Community Bank Ltd	16,285	1,001	1,011	1,196	1,974
2020	First Community Bank Ltd	18,819	1,015	1,054	1,292	838
2021	First Community Bank Ltd	20,248	1,735	1,612	2,214	694
2016	Guaranty Trust Bank Ltd	17,051	586	395	483	3,289
2017	Guaranty Trust Bank Ltd	15,141	2,347	1,633	1,874	1,596
2018	Guaranty Trust Bank Ltd	15,718	2,250	1,422	1,729	1,121
2019	Guaranty Trust Bank Ltd	18,932	2,171	1,348	1,840	909
2020	Guaranty Trust Bank Ltd	21,314	2,362	1,510	2,003	1,236
2021	Guaranty Trust Bank Ltd	22,315	2,721	1,543	2,436	1,165

2016	Guardian Bank Limited	12,313	1,976	1,003	1,233	1,406
2017	Guardian Bank Limited	13,120	1,679	736	964	1,236
2018	Guardian Bank Limited	12,910	1,781	717	1,065	1,397
2019	Guardian Bank Limited	13,078	1,625	684	934	1,574
2020	Guardian Bank Limited	13,238	1,618	827	904	1,405
2021	Guardian Bank Limited	14,348	1,630	825	961	2,572
2016	Gulf African Bank Ltd	21,213	2,516	1,694	2,448	2,067
2017	Gulf African Bank Ltd	26,074	2,512	2,377	2,631	2,453
2018	Gulf African Bank Ltd	26,114	2,859	2,683	2,975	1,967
2019	Gulf African Bank Ltd	27,818	2,760	2,481	2,699	1,252
2020	Gulf African Bank Ltd	29,972	2,869	2,323	2,882	1,133
2021	Gulf African Bank Ltd	29,170	2,913	2,258	2,946	1,268
2016	Habib Bank A.G Zurich	11,753	1,211	341	834	837
2017	Habib Bank A.G Zurich	12,468	1,764	578	987	765
2018	Habib Bank A.G Zurich	15,078	1,895	727	1,086	619
2019	Habib Bank A.G Zurich	20,532	2,107	816	1,201	670
2020	Habib Bank A.G Zurich	21,749	2,211	805	1,256	861
2021	Habib Bank A.G Zurich	22,412	2,356	836	1,378	925
2016	I & M Bank Ltd	118,553	20,000	7,609	16,260	5,461
2017	I & M Bank Ltd	132,801	19,603	9,052	16,568	5,252
2018	I & M Bank Ltd	175,177	20,325	9,132	17,858	8,608
2019	I & M Bank Ltd	195,841	21,115	6,530	18,542	9,200
2020	I & M Bank Ltd	218,153	21,377	8,239	18,528	2,533
2021	I & M Bank Ltd	228,030	24,615	11,484	22,071	2,781
2016	KCB Bank Kenya Ltd	386,391	56,179	29,703	58,185	18,055
2017	KCB Bank Kenya Ltd	440,164	56,944	33,530	61,002	17,802
2018	KCB Bank Kenya Ltd	475,396	66,280	35,000	71,803	50,101
2019	KCB Bank Kenya Ltd	536,830	74,350	38,515	84,301	83,235
2020	KCB Bank Kenya Ltd	588,628	96,261	42,230	95,065	64,608
2021	KCB Bank Kenya Ltd	837,141	114,826	47,834	109,323	71,612
2016	Kingdom Bank Ltd	7,924	1,112	875	385	67
2017	Kingdom Bank Ltd	5,383	1,380	1,246	485	75
2018	Kingdom Bank Ltd	4,006	1,223	943	559	8
2019	Kingdom Bank Ltd	4,795	671	1,384	144	20
2020	Kingdom Bank Ltd	5,081	1,781	1,288	1,412	339
2021	Kingdom Bank Ltd	6,380	3,158	2,294	2,807	329
2016	Middle East Bank (K) Ltd	3,894	587	370	269	301
2017	Middle East Bank (K) Ltd	3,908	456	301	260	810
2018	Middle East Bank (K) Ltd	3,987	501	328	329	255
2019	Middle East Bank (K) Ltd	7,138	653	467	527	463
2020	Middle East Bank (K) Ltd	9,523	909	456	561	57

2021	Middle East Bank (K) Ltd	9,465	1,024	524	675	112
2016	M-Oriental Commercial Bank Ltd	6,937	1,238	703	738	795
2017	M-Oriental Commercial Bank Ltd	7,463	1,228	677	793	975
2018	M-Oriental Commercial Bank Ltd	7,134	1,174	592	698	1,161
2019	M-Oriental Commercial Bank Ltd	9,188	1,118	568	633	1,060
2020	M-Oriental Commercial Bank Ltd	9,749	1,306	792	835	776
2021	M-Oriental Commercial Bank Ltd	10,242	1,307	698	765	763
2016	National Bank of Kenya Ltd	97,851	12,328	10,792	10,954	5,237
2017	National Bank of Kenya Ltd	94,544	9,962	8,340	9,080	5,493
2018	National Bank of Kenya Ltd	98,241	8,912	7,534	8,122	4,373
2019	National Bank of Kenya Ltd	97,079	9,028	9,166	8,344	11,347
2020	National Bank of Kenya Ltd	99,229	9,730	8,582	8,894	3,751
2021	National Bank of Kenya Ltd	106,103	12,240	8,724	10,111	7,723
2016	NCBA) Bank Kenya PLC	161,197	13,853	6,970	14,563	7,564
2017	NCBA) Bank Kenya PLC	178,378	15,643	9,566	16,755	8,674
2018	NCBA) Bank Kenya PLC	182,261	17,161	10,952	18,904	10,002
2019	NCBA) Bank Kenya PLC	360,305	22,797	16,943	26,233	23,684
2020	NCBA) Bank Kenya PLC	389,484	39,474	34,279	41,234	22,414
2021	NCBA) Bank Kenya PLC	390,463	42,196	26,886	43,708	28,388
2016	Paramount Bank Ltd	7,708	1,182	374	478	661
2017	Paramount Bank Ltd	7,729	1,017	374	470	991
2018	Paramount Bank Ltd	7,836	997	329	480	1,089
2019	Paramount Bank Ltd	8,479	1,040	380	466	779
2020	Paramount Bank Ltd	9,265	1,114	457	554	712
2021	Paramount Bank Ltd	10,197	1,278	469	621	830
2016	Prime Bank Ltd	49,165	7,579	2,208	4,544	2,156
2017	Prime Bank Ltd	57,555	7,370	2,661	4,638	4,146
2018	Prime Bank Ltd	70,298	8,007	2,562	4,651	8,130
2019	Prime Bank Ltd	81,345	9,237	3,010	5,467	5,264
2020	Prime Bank Ltd	88,548	9,660	3,903	5,752	4,749
2021	Prime Bank Ltd	97,195	10,648	3,715	6,618	5,501
2016	SBM Bank Kenya Ltd	4,251	1,666	2,954	687	266
2017	SBM Bank Kenya Ltd	6,429	638	667	295	1,808
2018	SBM Bank Kenya Ltd	49,702	2,519	2,284	4,782	8,138
2019	SBM Bank Kenya Ltd	50,573	6,735	3,613	4,793	6,574
2020	SBM Bank Kenya Ltd	56,033	7,352	4,614	4,830	5,448
2021	SBM Bank Kenya Ltd	60,065	7,687	4,586	4,649	4,232
2016	Sidian Bank Ltd	13,684	3,096	2,435	2,497	1,575
2017	Sidian Bank Ltd	12,761	2,014	2,337	1,704	1,962
2018	Sidian Bank Ltd	16,571	2,118	2,670	2,108	1,408
2019	Sidian Bank Ltd	18,014	2,133	2,266	2,331	2,437

2020	Sidian Bank Ltd	22,768	2,487	2,095	2,199	1,646
2021	Sidian Bank Ltd	1,252	3,543	2,427	3,127	803
2016	Spire Bank Limited	8,531	1,439	1,810	842	748
2017	Spire Bank Limited	6,816	1,071	2,126	550	203
2018	Spire Bank Limited	6,474	663	663	274	503
2019	Spire Bank Limited	4,553	432	563	110	35
2020	Spire Bank Limited	4,793	74	253	(16)	24
2021	Spire Bank Limited	1,252	293	1,064	(102)	21
2016	Stanbic Bank Kenya Ltd	122,888	17,114	10,953	18,140	7,050
2017	Stanbic Bank Kenya Ltd	153,009	16,593	13,048	18,648	6,458
2018	Stanbic Bank Kenya Ltd	196,539	18,879	12,349	21,147	20,037
2019	Stanbic Bank Kenya Ltd	205,516	20,405	15,307	23,546	24,021
2020	Stanbic Bank Kenya Ltd	216,805	19,709	15,736	21,973	15,200
2021	Stanbic Bank Kenya Ltd	239,869	20,125	14,701	24,268	17,885
2016	Standard Chartered Bank Kenya Ltd	191,082	25,759	14,547	27,311	12,040
2017	Standard Chartered Bank Kenya Ltd	213,349	26,223	17,009	26,519	9,618
2018	Standard Chartered Bank Kenya Ltd	223,391	26,788	16,271	27,704	16,704
2019	Standard Chartered Bank Kenya Ltd	236,461	25,161	16,162	28,854	17,333
2020	Standard Chartered Bank Kenya Ltd	256,498	23,722	19,750	26,768	16,944
2021	Standard Chartered Bank Kenya Ltd	265,469	22,285	16,087	28,229	20,076
2016	UBA Kenya Bank Ltd	1,731	524	539	589	129
2017	UBA Kenya Bank Ltd	2,993	566	589	603	430
2018	UBA Kenya Bank Ltd	5,801	1,236	679	703	1,242
2019	UBA Kenya Bank Ltd	13,600	1,549	837	942	328
2020	UBA Kenya Bank Ltd	7,772	1,543	994	485	550
2021	UBA Kenya Bank Ltd	1,491	1,028	1,309	(72)	539
2016	Victoria Commercial Bank Limited	15,696	2,451	608	1,373	1,339
2017	Victoria Commercial Bank Limited	18,677	2,712	759	1,595	1,749
2018	Victoria Commercial Bank Limited	23,208	3,199	785	1,337	2,640
2019	Victoria Commercial Bank Limited	27,350	3,710	907	1,539	2,812
2020	Victoria Commercial Bank Limited	28,286	3,723	915	1,383	2,663
2021	Victoria Commercial Bank Limited	32,364	4,212	1,022	1,546	2,384