

**EFFECTS OF FIRM CHARACTERISTICS ON OPERATIONAL EFFICIENCY OF
COMMERCIAL BANKS IN KENYA**

BY

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MASTER OF SCIENCE IN COMMERCE (FINANCE AND ACCOUNTING)

KCA UNIVERSITY

NOVEMBER 2022

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**A RESEARCH DISSERTATION SUBMITTED TO THE SCHOOL OF BUSINESS IN
PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF
MASTER OF SCIENCE IN COMMERCE (FINANCE AND ACCOUNTING OPTION)
OF KCA UNIVERSITY**

NOVEMBER 2022

DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contain no material written or published by other people except where due reference is made and author duly acknowledged.

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Date: 23/09/2022

I do hereby confirm that I have examined the master's dissertation of
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been adequately addressed.

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ABSTRACT

The role played by Commercial banks in any economy in the world cannot be over-emphasized. Commercial banks in Kenya have contributed to savings which interprets to 78.55% of the total savings in the economy. The efficiency of commercial banks is of big importance in order to ensure that the financial sector is stable. There has been an increased cost of running a banking business that has led to increased cost of loans and customer dissatisfaction in commercial banks in Kenya. This study sought to examine the effect of firm characteristics on operational efficiency of commercial banks in Kenya by evaluating the effect of capital adequacy, asset quality and bank liquidity and on operational efficiency of commercial banks in Kenya. The study also assessed the moderating effect of bank size in the relationship between firm characteristics and operational efficiency of commercial banks in Kenya. The study stands to benefit researchers, policymakers and commercial banks. The study may face the limitation of non-response. The study was anchored on the liquidity preference theory, credit creation theory and buffer capital theory. The study is descriptive research design and targeted a population of 40 commercial banks licensed and operating in Kenya. Secondary data will be used which will be obtained public annual financial statements from the various commercial banks' website and Central bank of Kenya website. The data collected was analyzed for descriptive and inferential statistics using Statistical Package for Social Sciences Version 26.0 and presented using graphs tables, charts and a linear regression equation. From the analysed data, there is weak relationship between capital adequacy and operational efficiency of commercial banks in Kenya as shown by a coefficient value was 0.15. Secondly, the assets quality is key in determining the operational efficiency of the commercial banks in Kenya as shown by a correlation coefficient of 0.717. Liquidity was established to be statistically correlating with operational efficiency in commercial banks in Kenya and this was shown in correlation value of 0.602. Bank size evaluated based on the total assets owned by the commercial banks revealed a strong positive relationship with banks operational efficiency as shown by a correlation value of 0.813. From these findings, the study recommended that banks should strategize to increase their core capital as this will avail more funds for lending which is the key banking function. Lending will earn the bank interest hence improve their operational efficiency. Finally, the Treasury and the bank managers should establish a should framework to ensure the commercial banks have enough assets to sail through the unstable economic conditions in the financial sector. The assets will able banks meet their operational cash needs, invest adequately and make profits.

Key Words: Firm Characteristics, Operational Efficiency, Capital Adequacy, Asset Quality, Liquidity, Bank Size, Commercial Banks.

ACKNOWLEDGMENT

I acknowledge the great support I was given by my supervisor Dr. Peter Njuguna to complete this work. I also acknowledge the KCA University administration for providing the necessary resources and for enhancing a great and conducive environment to achieve this research work.

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ACRONYMS AND ABBREVIATIONS

CBK	Central Bank of Kenya
SPSS	Statistical Package for Social Sciences
CBK	Central Bank of Kenya
ROA	Return on Assets
ROE	Return on equity
NPL	Non-performing Loans

OPERATIONAL DEFINITION OF TERMS

Asset quality	It refers the asset of the assets held by a financial institution. The asset quality measures the degree to which a financial institution predicts the credit risk of the assets held and instituting measures to manage the risks identified. It is the proportion of non-performing loan to the total loans held by a financial institution.
Bank size	It is the measure of the total value of assets of the bank.
Capital adequacy	It is the ratio of core capital to total assets.
Liquidity	It refers to the ease at which firms' assets can be converted into cash to meet short-term payments. It is the ratio of current assets to current liabilities.
Operational efficiency	It is the ability of commercial banks to reduce the waste of time and effort as much as possible, while still producing a high-quality service to its customers. It is the ratio of operating income to total assets.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Financial institutions have overtime played a significant role as financial intermediaries in bringing together those have surplus funds with limited investment opportunities with the individuals in the economy with profitable investment opportunities though with limited funds (Nyabaga & Wepukhulu, 2020). Almost all sectors in the economy have depend on the banking sector for their very existence and development. In extending their services, the banks must then operate efficiently since the commodity their offer is critical not only to the survival of business but also the entire economy (Gikombo & Mbugua, 2018). The importance of operational efficiency of commercial banks cannot be therefore overemphasized. In the recent past, there has been a notable development in the financial and specifically the banking industry in Kenya. Areas of notable's development is felt on the number of commercial banks, the number of customers served by the commercial banks, the size of the commercial banks and their profitability (Odunga, Nyangweso, Carter & Mwarumba, 2013). At the center of the banking concept is the bank characteristics which has been a topic of discussion by scholars and economists for a long time.

In Latin America, a study was performed by Conti, Goldszmidt and Vasconcelos (2020) to establish the relationship between firm characteristics and capabilities that enable superior performance in recessions. It was established that the firms with superior level of financial performance during the period of recessions are firms having high propensity of noticing investment opportunities and those that are innovative. Moreover, in China Lee, Chen and Ning (2017) established that firms with more leading shareholder ratios in terms of firm ownership or older firms displayed saliently higher level of financial performance during the financial crisis, the

same category of firms did not prove to perform well in the absence of crisis. The authors established that firms in a bid to survive and offer superior services in the Chinese market tend to capitalize on their unique features.

Regionally, Egbunike and Okerekeoti (2018) postulates firm characteristics such as firm size, leverage and liquidity affected the performance level of institutions in Nigeria. Secondly, De Vries (2010) perceived firm characteristics as assets structure, profitability, liquidity, size, growth, and business risk in South Africa. It was discovered that the level of firm growth as well as the rate of interest are the biggest characteristics and factors for consideration. These key variables are therefore imperative in determining firm financing decisions. Egbunike & Okerekeoti (2018) firm characteristics can be evaluated using parameters such as the leverage ratio, the bank size and liquidity ratio which highly affects the banks financial performance. The authors suggested that banks should never eliminate their size in terms of assets base while assessing their performance, operational efficiency or even doing a market comparison with leaders of the industry.

In Kenya, Kaguri (2013) argues that firms' specific characteristics like the firm liquidity, quality of assets, adequacy of firm capital and size of a firm are variables which have an impact on business performance. Gulzara, Hongxing and Muhammad (2018) also argued in their study that bank specific characteristics have a huge impact on the soundness of commercial banks. Bank specific features are the unique characteristics forming banking establishment and they encompass variables such as bank size, capital adequacy, bank liquidity, and asset quality (Nyabaga & Wepukhulu, 2020). The size of bank may be interpreted to be the market value of all banking investment which majority in credit facilities extended to the customers. The bank market value may also use the following indicators; the bank's asset base, banks' availability in the country and beyond and the volume of their sales. The banks' asset base is the value of its underlying assets

which represents the value to the financial institutions. The asset base of a financial institution is a non-static variable that rises and drops from time to time as is being affected by the market forces of demand and supply (Gikombo & Mbugua, 2018).

1.1.1 Firm Characteristics

Firm characteristics in the banking context revolves around the banks managerial as well as demographic factors comprising of part of the firm's internal environment in which the firms' management have full control over them (Buvanendra, Sridharan, & Thiagarajan, 2017). The banks specific characteristics may take the form of size of the firm, the extent of leverage, the level of liquidity, the growth in the firm sales volume, the growth in asset base and the structure of ownership among other characteristics (Ebenezer, Omar & Kamil, 2017). Athanasoglou, Sophocles and Matthaïos (2008) on the other hand pointed out that organization specific characteristics are the factor which are internal and within the control of a firm. They are associated with the firm financial stability. This study will review the bank size, assets quality, capital adequacy and liquidity as the key firm characteristics with the potential of affecting the banks operational capacity.

Bank size which is measured using the level of assets holding, level of sales volume and the number of employees has been linked with banks performance in two spectrums (Ebenezer, Omar, & Kamil, 2017). Bigger banks in have more diversified capabilities and the ability exploit their economies of scale and have formal procedures guiding their operations. In addition, big banks have the affinity of attracting a better quality of human resources in which they will in turn make a remarkable contribution to the organizational financial performance. The opposite is true for small banks with which face difficulties in penetrating the market, attracting quality employees and even meeting their operational expenses (Muhindi & Ngaba, D2018). Kagecha, (2016) argued that bank size does not matter in determining bank profitability. This suggests that though scale

economics are important for profitability, local markets in Kenya do not continuously permit such scale economics to translate to advanced profitability. The control variables covered profitability, market concentration; gross domestic product growth and inflation were all important in elucidating bank profitability.

Among the key firm characteristics is the firms' level of liquidity which refers to the firm current assets to current liabilities ratio measured in a fixed duration and in most cases, one year and is based on the firm's cycle of operation (Alali, 2019). For any firm to remain in operation; meeting short term obligation is a prerequisite, this implies that firms are able to pay off its creditors as and when they fall due. The extent of firm liquidity should be managed since a too liquid firm is not good for any firm as it indicates that a firm left some financial resource idle which could be converted into profitable investment. It may also indicate the lack of investment opportunities by firms or managerial decision to convert the idle cash into profit. On the other hand, a low level of liquidity implies struggles by firm to defray its short-term obligations, (Kandiru, Gachunga, Muturi & Ogutu, 2015).

Capital adequacy is the measure of a bank's available resources which can be accessed to be utilized by commercial banks to cushion themselves against going into the state of bankruptcy and other emergencies which may arise in the course of their business (Karminsky & Kostrov, 2014). Maintenance of a predefined level of capital is key in commercial banks in the quest of financial stability as it manages the risks associated with insolvency (Hanke 2013). The general agreement can be noted that banking sector that possesses larger capital cushions has an advantage in position and helps organizations together with family units in terrible moments; buffers assist banks to navigate through constraints and maintain loaning, amidst a downturn (Gudmundsson, Ngoka & Odongo, 2013).

Asset quality is described to be the health of the assets held by commercial banks, the biggest junk of assets in commercial bank are in credits extended to the customers, the assets quality in this perspective therefore implies the proportion of performing loans to the total loans held by a commercial bank; (Sekar, 2014). Ombaba (2013) argues that a non-performing loan assets resource is a credit extended to the customers and the customers have not been able to meet their repayment obligation and as a result, the interest in that facility together with its principal is at risk as may not be repaid or will be received at a later date outside the agreed time frame and when the firms' operation has been paralyzed. The financial soundness of any economy is dependent on the financial stability of commercial banks and the financial system. In order for a firm to accomplish the financial stability and soundness, the quality of firm assets plays a central role since the quality of assets determines the degree of operational efficiency (Vigneswara (2015)

1.1.2 Operational Efficiency

Operating efficiency in the commercial banks is defined as the ability of a bank to reduce its operating costs when executing all its daily banking functions and operations to achieve the set goals (Lotto, 2019). Operational efficiency is attained through the utilization of the most competent human resource, sufficient technology in the processes, and provision of superior quality to all clients. The banks when channels deposits to borrowers and or undertaking growth strategies should do so in a controlled manner that's modelled through a sound policy so as to generate more income in all activities.

The banking Survey conducted in 2018 lists down the indicators of performance used in the banking sector in Kenya in the quest of improving their operational efficiency. The indicators included though not limited to the quality of asset, the sufficiency of capital for lending, the commercial banks' level liquidity and the size of the bank firm size which are turn referred to as

firm specific characteristics. Among the four indicators, the study ranked the sufficiency of capital top on the list (Menicucci & Paolucci, 2017). Bank liquidity was the second explanatory variable measured as the ratio of loan to deposit (Sporta, 2018). Asset quality was the third explanatory variable measured in terms of loan loss provision to operating income while firm size came last and was measured using the asset base of commercial banks (Sekar, 2014).

Brown, Hassan and Skully (2007) evaluated the association between the operational efficiency of Islamic commercial banks. The study related bank size to the two measures on banks' technical efficiency which were the scale and technical efficiencies. The study findings revealed that commercial banks have serious hitches relating to the technical inefficiency which encompasses the wastages of bank resources which surpassed the expected level. The study proved that the decision of adopting the intermediation approach or the value-added approach while evaluating the activity of commercial banks greatly affects the average levels of technical efficiency for all bank size. It was established a positive correlation between operational efficiency and financial performance which was measured using Return on Assets (ROA) using listed firms in Nairobi Securities Exchange. Operational efficiency had a statistically important association with return on asset.

In order to assess the operational efficiency of commercial banks, indicators such as adequacy of capital, size of the firm, asset quality and firm liquidity may be used (IMF, 2013). These indicators ensure the ability of a bank to survive negative market conditions. Failure to attain the desired level of these indicators will reverse the status of commercial banks from sound to unsound (Salina, Zhang & Hassan, 2020). For the purpose of this study, banks operational efficiency will be determined as a ration by making a comparison between annual operating income and annual operating expenses for each bank. Operating income is the is the total amount

of revenue generated by the banks from its operations while the operating expenses are the total paid expenses while the bank is offering services to its clients such as utility. The study will determine the operational efficiency by establishing the ratio between the commercial banks operating income on aggregate and the aggregate operating expenses.

1.1.3 Commercial Banks in Kenya

The banking sector in Kenya is regulated by several Acts of parliament such as the Banking and the Companies Acts. The banking sector was given full liberalization in 1995 upon which lifting of exchange controls was implemented. The Central Bank of Kenya has been tasked with the responsibilities of formulating and implementing a monetary policy that among other aims seeks to foster the bank's solvency and liquidity and ensure the proper functioning of the financial system in Kenya while ensuring financial inclusion and economic growth, (Central Bank of Kenya, 2021). Kenya has forty licensed commercial banks operating in which forty of them are fully privately. On the other hand, twenty-six of the privately owned commercial banks are locally owned with fourteen having foreign ownership (CBK, 2021).

The Central Bank of Kenya (CBK) has classified the commercial banks in Kenya and is classified into three tiers based on banks size among other variables. The classification system aids stakeholders in differentiating banks based on their asset base, market share, assets base and amount number of deposits. The first category is comprised six large commercial banks in terms of assets base and depositors which jointly control forty-nine percent of the market. The second category controls forty-one percent whereas the third category is comprised small sized commercial banks controlling ten percent of the total market size. Operational efficiency over the two decades has not been impressive in Kenya when compared to other countries in the region (Waweru & Kalani (2009). Owing to challenges in performance, a number of tier three banks have closed their shops and some of them such as Dubai bank, Chase bank and Imperial bank have been

put under receivership. The key contributor to being put under receivership is the liquidity challenges and quality of assets which was diagnosed through the insider lending (Stavis, 2016).

In Kenya, commercial banks offer indifferent range of products and services, the commercial banks have progressively implemented strategies aimed at attracting new customers as well as retaining the existing clientele. Commercial banks therefore, should endeavor to be efficient to their client and must implement initiatives to maintain superior customer service levels while remaining profitable guidelines (Central Bank of Kenya, 2010).

1.2 Statement of the Problem

The efficiency of commercial banks has rematerialized as a very critical item to the general public as well as individual investors with shaken confidence in the manner in which financial institutions are managed and the sector has reported numerous lapses in Kenya (IMF, 2013). The efficient operation of the banking sector provides and payment system which is a necessary for development of businesses in every economy. Business development can be enhanced by efficient banking system through low cost of credit, which in turn affects the level and rate of economic growth and confidence in the banking sector.

Kenya has experience bank failures in the recent past which include the collapse of the Imperial banks, Chase bank and the recently witnessed mergers and acquisition on National Bank of Kenya. The liquidation, mergers, and acquisition were warranted due to the inability to repay the deposits obtained from its customers and increased cost of operation which is attributed to increased inefficiencies (Njihia, 2018). The efficiency of commercial banks is of great importance if the country seeks to realize financial stability of the banking. The soundness of banking activities has a direct impact in the overall financial stability of the economy of any country in the world.

However, commercial banks have not been efficient as evident by the increased cost of lending of 4.42% when compared to a rise of 2.17% in the region over the same period (CBK, 2020). Studies have not considered the indicators of financial soundness which play a key role in determining operational efficiency of commercial banks. Secondly, the junk of citizens that can access the financial services has gone down from the previous 13.5% in 2015 to 9.1% in 2019 where its customers have opted for non-bank financial institutions, (FSD Kenya, 2020). Lastly, even though Kenya is ranked the leading in East Africa, in the parameter aggregate assets owned by the commercial banks, it is still behind with a 19% penetration rate which is less than Senegal's rate of penetration which stands at 21.9% (CBK, 2020). Ombado (2018) argues that low penetration is often associated with inefficiencies among other reasons. Low rate of penetration could be attributed to bank size, capital adequacy in which the study did not elucidate their relationship with banks operational efficiency in which this study seeks to answer.

Nyabaga and Wepukhulu, (2020) examined firm characteristics but focused on financial performance of commercial banks while Too and Simiyu (2018) looked at financial performance of general insurance. A study closer to the study underway was Wafula (2020) but did not fill the gap the link that exists between firm characteristics and operational efficiency especially for the commercial banks. It is imperative that operational efficiency of commercial banks is evaluated. There is no study found which evaluated the effect of firm characteristics and banks operational efficiency in Kenya creating a knowledge gap to be filled by this study.

1.3 Objectives of the Study

1.3.1 General Objective

The main aim of this research was to examine the effect of firm characteristics on operational efficiency of commercial banks in Kenya.

1.3.2 Specific Objectives

- i. To evaluate the effect of capital adequacy on operational efficiency of commercial banks in Kenya.
- ii. To determine the effect of asset quality on operational efficiency of commercial banks in Kenya.
- iii. To examine the effect of bank liquidity on operational efficiency of commercial banks in Kenya.
- iv. To establish the effect of bank size on operational efficiency of commercial banks in Kenya.

1.4 Research Questions

- i. What is the effect of capital adequacy on operational efficiency of commercial banks in Kenya?
- ii. What is the effect of asset quality on operational efficiency of commercial banks in Kenya?
- iii. What is the effect of bank liquidity on operational efficiency of commercial banks in Kenya?
- iv. What is the effect of bank size on operational efficiency of commercial banks in Kenya?

1.5 Justification of the study

The study will make an immense contribution to the limited existing knowledge on firm characteristics that could explain the of commercial banks' operational efficiency. The study will reveal the effect of bank liquidity, capital adequacy, bank size and asset quality variables on operational efficiency of commercial banks in Kenya. The study therefore will fill this gap in knowledge.

1.6 Significance of the study

The following parties will benefit from the findings of this study.

1.6.1 Commercial banks management

The study findings will have several benefits to the management of commercial banks in both in Kenya and beyond and at the board level and executive levels by demonstrating the manner in which operational efficiency may be improved by considering various aspects of firm characteristics. Identifying the most efficient commercial bank in terms of operation, will provide a suitable basis for commercial banks to perform benchmarking and improve on their efficiency. Due to the nature of the specific characteristics of a firm that are internal the findings of this study will help managers to institute measures aimed at promoting operational efficiency in quest to enhancing firm financial performance.

1.6.2 Policymakers

In making policies touching commercial banks, the findings of this study will be of great importance. The policy makers would want to institute policies that will ensure operational efficiency of commercial banks. Since the study will enumerate how the specific characteristics such as asset quality, firm size, sufficiency of capital and liquidity, the policy makers will make research backed decision. The policies formulated will not just enhance the quality of services rendered by the commercial banks to its customers but will also improve the extent of financial services access in the economy.

1.6.3 Researchers and Academicians

First, the scholars and other researchers interested in conducting research in the banking industry will make use of the results arising from this research. This research seeks to provide information on how firm characteristics relates to the operational efficiency. Owing to the limitation that will be encountered during the conduct of the study, suggestions will be given at the end of the study

in which the upcoming researchers may perform their studies on. Similarly, researchers will use the findings of the study to form foundation for their studies.

1.7 Scope of the study

The study concentrated on the effect of firm specific characteristics and the operational efficiency of commercial banks. The study measured the firm characteristics using four variables which include the size of the firm, the level of capital that a firm has, the level of liquidity and assets quality. The operational efficiency was measured in terms of the proportion of firm operating income to the total expenses incurred by the bank on annual basis. This study is informed by the fact that commercial banks in Kenya account for 82% of the total assets and 77% of the deposits held in the financial sector. This underscores their significance in the industry. The study utilized data related to five years from 2017 to 2021. The period selected is informed by the time in which several banks have shut down their operations in Kenya citing performance. While many firm characteristics may influence the operational efficiency, this study only investigated the characteristics that were considered by earlier scholars in similar research and they include capital adequacy, bank liquidity, bank size, and asset quality.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter covers the theoretical framework in which the study is anchored on, the empirical literature where past studies are discussed and conceptual framework the presents the relationship between study variables.

2.2 Theoretical Literature Review

The study was anchored on buffer capital theory, credit creation theory, liquidity preference theory and theory of constraints.

2.2.1 Buffer Capital Theory

Buffer capital theory was put forward by Caleb and Rob (1996). The theory argues that in order for a bank to minimize the costs from the regulators, it is required that a bank should monitor the minimum required ration of capital ratio. Commercial banks are penalized by the regulator whenever they fall below the prescribed ratio. The penalties from the regulator may be in the form of monetary penalty and/or repossession of trading license. This theory argues that, there is an optimal level of capital required to ensure that regulatory costs are minimized and also to ensure that commercial banks do not hold excess liquidity and instead commit the resources into profitable opportunities. This theory contends that the maintenance of a capital buffer possibly will strengthen the financial performance of commercial banks. This is because the reduced rate of credit creation and the total of total loans will be decreased owing to the reduced demand for loans by borrowers.

Jokipii, & Milne, (2011) examined the correlation amid the firm short-term and medium-term capital buffer and portfolio risk adjustments, building an unbalanced panel of United States commercial bank parent company utilizing the balance sheet data of the commercial banks from

1986 to 2006. The estimates indicated that the correlation throughout the period sampled period was a two-fold relationship. In addition, the findings show that degree of bank capitalization determined the management of such adjustments. Further, a cyclical configuration in the unexposed relationship by the investigation was revealed through time-varying analysis revealed. Abbas, Butt, Masood & Javaria, (2019) did a study to examine the impact financial institutions capital buffer on the risk and net interest margin using data from the commercial banks in the United States. The findings of period revealed that buffer capital has a positive and significant effect on total risks of the commercial banks.

For the purpose of this study, buffer capital theory was adopted to explain how commercial banks can hold a minimum amount of capital against the riskiness of their assets to make commercial banks in Kenya more resilient to losses to ensure their operational efficiency. Banks when playing their basic role of financial intermediary, they must recognize the risk that comes along with their duty such as credit default and breach of financial regulations while chasing profits. There has been many defaulters in the country and most of the policy interventions in place have not properly addressed the credit risk fears from the banks.

2.2.2 Credit Creation Theory

Credit creation theory was developed by Henry MacLeod in 1856. He holds that the nature of money is notes to purchase commodities and its basic function is to purchase goods regardless of its form. Hence, money does not necessarily have to be gold or silver and the real economy, thus promoting production and investment, and then increase wealth and allow business to prosper. In short, credit expansion can create money, wealth, and capital. He holds that money, credit, and wealth are of the same nature, all of them being an order, commitment, or trading privilege that can be satisfied, with the common characteristics of the possession of purchasing power. He

maintains that credit creation comes endogenously from the exchange process and is closely connected to the appearance and disappearance of credit and debt contracts. The theory states that commercial banks can make money in an economy. Additionally, due to their lending activities, banks yield deposits which then create new purchasing power.

The lending by commercial banks may lead to commercial bank increasing the deposit held. Subsequently, the amount of money that a commercial bank can mobilize is not restricted by the deposit held, as a result, a non-previously existing purchasing power may be arrived through the commercial banks' lending. In practice, the credit creation theory means that banks do not lend simply what they are given in deposits, but relatively that they make deposits in order to lend. The view of risk affects the sum of money in the economy. Therefore, according to this theory, over time bank balance sheets and magnitudes of the money supply tend to display an increasing tendency in times when outstanding bank credit develops.

This theory was used to explain the bank's asset quality. The bank assets constitute of fixed and current assets, credit portfolio among other investments. Loans comprise of the largest portion of a bank's assets and constitute the greatest amount of risk to their capital. The level at which banks are able to accumulate adequate deposits from the depositors will ultimately determine the level at which they can lend borrowers and the interest rates to be charged. With adequate cash deposited by the lenders, banks are in a pole position to advance credit to its customers who repay with interest.

2.2.3 Liquidity Preference Theory

The theory was developed by John Maynard Keynes 1936. The theory argues that an individual requires liquid money for three distinct reasons namely; transaction motive which is holding money for the purpose of meeting daily expenditure, precautionary motive which is holding money for emergencies not planned for and speculative motive which is meant taking care of investment

opportunities should they arise in the future. The expense on liquidity refers to the interest rate charged by the depositor for providing the funds. This rate of interest is dependent on the need for liquidity. The depositor may prefer liquid cash as opposed to other assets or other extremely liquid holdings. As argued by Keynes liquidity preference is the need for money, considered as liquidity by borrowers.

Bibow (2013) argued that the claim for liquidity holds hypothetical power; liquid investments are easier to cash in for full value. The depositors will not forego liquidity over other better time-frames investments such as medium or longer-term. The transactions intention positions that persons have a liking for liquidity to guarantee having enough cash on hand for essential day-to-day needs. Liquidity enables the banks to meet their demand for money easily and therefore the central monetary authority must establish a certain ration that banks must be liquid. This acts a guide for all banks when dealing with deposits and credit creation.

This theory was criticized for viewing interest from the perspective of monetary forces only and ignoring the aspect of capital risk and production levels in the economy. Keynes argued that interest was a reward by the lenders and that is paid for by the borrowers. However, sometimes this investment is very low as interest as sometimes affected by factors outside the demand and supply for money. Therefore, the theory lacks options upon which lenders can pursue in a bid to improve their level of earning.

The theory of constraints was adopted in this study to support the study's independent variable, bank liquidity. The commercial banks have to design their target level of liquidity that will ensure that the banks have sufficient liquidity to enable for operational efficiency of commercial banks. This theory therefore provided the reasons for liquidity preference. Banks must ensure at all times of operations that they have adequate liquidity within their coffers or hold assets

that can easily be liquidated as and when needed to ensure efficient service delivery to their clients. When the clients are satisfied through provision of credit and or when making withdrawals, the bank's performance also improves and the operating profit goes up.

2.2.4 Theory of Constraints

The theory of constraints was first developed by Eliyahu Goldratt in 1984. The theory argues that constraints are the factors influencing how a system functions and give prediction on the level of performance. According to Goldratt a constraint is taken to mean any situation, factor or object that restricts a system from attaining intended results. Rahman (1998) argued that a system is a set of interrelated parts sharing some common results. This theory adopts that there are seven focusing steps for managing resources and market constraints which comprises of deciding on the objective of a system, determining the parameters for use in gauging the degree of performance, identifying the system's constraints, deciding how to exploit the system's constraints and if in a previous step the constraint is broken, the organization should go back to identify the system's constraints. The organization should not let inertia cause a system constraint.

As postulated by Mabin & Balderstone (2020) theory of constraint assumes that in every management strategy or programs, there are small factors that pose a challenge in achievement of the project's goal, when banks roll out programs to achieve to attain efficiency in all operations such as accounts opening, resolving customer complaints, issues of loans, remittances or even electronic banking some small but significant challenges crop up. If such challenges are not addressed in policy and in action, the goal which is to make banks efficient in-service delivery is not achieved. The bank's management should therefore be aware of these challenges and plan in advance on how to handle them through the strategy implementation process.

However, Wong (1998) felt that this theory did not address the best mechanisms that firms can use to mitigate obvious yet significant challenges. When drawing up a strategy, there are easily

identifiable threats to its success and there must be solved before the launch of the program by the management. The theory advocates for continuous evaluation of the implementation process without giving specifics on how the challenges can be isolated and dealt with. Schragenheim & Dettmer, (2000) has also criticized this theory by arguing it copied most of its principles from the systems theory which views an organization as an interconnection of different components working together to produce a desired result. This system when engulfed with a challenge does not produce the effect and the problem must be cleaned out which is the main articulation in the theory of constraints.

This theory explained the bank size variable of this study. The theory of constraints is a procedure for recognizing the most significant preventive feature that position in the method of attaining an objective and then methodically improving that constraint until it is no longer the restrictive factor. The implementation of this theory lead to some other benefits which include though not limited to gaining a better control over firms' operations and fewer inventories. Instead of paying attention to the individual parts, procedures and processes, it is also more effective to utilize the constraints. Service delivery by the commercial banks requires a sound policy and controls that will guide each procedure and eliminate any threat and, in the event, threats come up along the way, the management must have in place correctional mechanism.

2.3 Empirical Literature Review

This segment covers past researches conducted on firm characteristics useful in presenting what has already been done and the gap in knowledge in which this proposed study will fill. The past studies all will reveal the research strategies adopted and challenges faced which will be useful in planning and conducting the study.

2.3.1 Capital Adequacy and Operational Efficiency

Capital is the aggregate bank's own fund available to support the business and act as a buffer in case of adverse situation (Olweny & Shiphoh, 2011). Capital creates liquidity for the bank due to the fact that deposits are most fragile and prone to bank runs. Besides, immense bank capital reduces the chance of distress (Dang, 2011). Still, it is not without drawbacks that it induces weak demand for liability, the cheapest sources of fund. Therefore, capital adequacy is the level of capital obligatory by the banks to enable them withstand the risks such as credit, market and operational risks they are exposed to in order to absorb the potential losses and protect the bank's debtors.

Nguyen (2020) evaluated the impact of capital adequacy on bank profitability in the context of Basel II Accord implementation in Vietnam. The study employed a panel data regression analysis with a sample of 22 Vietnamese commercial banks for the period 2010-2018, this paper shows that bank capital adequacy, net interest margin, and non-interest income measures are positively correlated with profitability indicators while non-performing loan indicator and state ownership measure negatively effect on bank profitability. The results found that bank capital adequacy has a positive impact on return on assets for small-sized banks meanwhile it has no significant impact on profitability for large-sized banks in Vietnam.

Pradhan, Shyam and Shrestha, (2017) conducted research to elucidate the correlation existing amid sufficiency of capital and efficiency of commercial banks in Nepalese commercial banks. The findings of the study showed that the deposit to asset ratio was the major factor determining the financial performance of commercial banks in Nepal followed closely by banks' operational efficiency. The operational efficiency of commercial banks cannot therefore be underscored. Firms seeking to report a good financial performance level must consider managing the level of efficiency. The loan ratio, deposit to assets ratio, the quality of assets and the

operational efficiency of commercial banks was discovered to positively influence firm financial performance.

Ifeacho and Ngalawa (2014) carried out a research study on the impact of bank specific variables and selected macroeconomic variables on the South African banking sector between 1994 and 2011. The researcher considered capital adequacy, asset quality, management, earnings ability and liquidity under the CAMEL model of bank performance evaluation in the study. The study employed data in annual frequency from South Africa's four largest banks, namely ABSA, First National Bank, Nedbank, and Standard Bank. The four banks account for over 70% of the South Africa's banking assets. The researcher investigated the banks using the return on assets (ROA) and return on equity (ROE) as measures of the bank performance. Findings indicated that capital adequacy exhibited a significant negative relationship with ROA, while its relationship with ROE is significant and positive as expected.

Barus, Muturi, Kibati, & Koima (2017) established the effect of capital adequacy on the financial performance of savings and credit societies in Kenya. The study employed an explanatory research design. The target population was 83 registered deposits taking SACCO's in Kenya that have been in operation for the last five years. Both primary and secondary sources of data were employed. Multiple linear regression models were used to analyze the data using statistical package for the social sciences (SPSS) and STATA. The study results found out that capital adequacy influenced the financial performance of savings and credit societies in Kenya. This can be explained by the regression results which showed that the influence was positive and also showed the magnitude by which capital adequacy influenced the financial performance of savings and credit societies.

Musyoka (2017) looked at the effect of capital adequacy on the financial performance on commercial banks in Kenya. The study adopted descriptive research design and the population was the 42 commercial banks hence census survey was undertaken. Secondary data collected in excel sheets from financial statements of the target population was used for this study. The results established that the relationship between capital adequacy of commercial banks and return on assets is negative and significant. The findings also show that the relationship between bank size and return on assets of commercial banks in Kenya is also negative and significant. However, the findings show that the relation between asset adequacy and ROA of the commercial banks is negative and insignificant while the relation between liquidity and ROA is positive and insignificant.

In a study conducted by Kangethe (2009) which sought to elucidate the relationship between commercial banks' operational efficiency and their rate growth in Kenya. Descriptive research design was employed and quantitative approach in order was used to generate in-depth data from the secondary data. The secondary data was obtained from the Central Bank of Kenya website. The focus of the research was on the present state of financial performance of the lending institutions in Kenya. The data relevant for the study was for the ten years period of 1998 and 2007. The research targeted all 42 commercial banks license to in operate in Kenya by the Central Bank of Kenya. The findings of the study showed a linear relationship between the study variables. Specifically, the commercial banks' operational efficiency determines 9.4% of the changes in the growth rate of commercial banks in Kenya.

Yuttama, (2020) did a study on the effect of capital, operating efficiency, liquidity, and lock credit on profitability of commercial banks in Indonesia. The inflation level was used as a moderator in the study. The study was descriptive research design in nature and targeted the

banking sector in Indonesia upon which sampling was done. The primary data was used which was collected with the aid of structured questionnaire. The data collected related to the five-year period between 2014 and 2019. The study utilized purposive sampling to obtain a sample of 43 commercial banks. It was established that capital has a positive and significant impact on the banks' profitability, on the other hand, it was established a negative through insignificant impact of the commercial banks' liquidity and operational efficiency on the profitability of commercial banks in Indonesia.

2.3.2 Asset Quality and Operational Efficiency

Said (2018) examined the effect of the asset quality on the bank profitability among small banks in United States of America. The study found out that priority sector credit was not enough to have an effect on non-performing. This was the opposite of general opinion and similar is the case with local branches stating aversion of rural credit is a false opinion. Performance of the whole banking sector rather than a specific bank is tied to bad debts. Additionally, capital adequacy and investment activity have a significant effect on profitability of banks, unlike assets size which has no effect.

Khalid (2012) studies the effects of asset quality to profitability of private banks found in India using Return on Asset as profitability variable for the period 2006 – 2011. The research used various models of regression to analyze correlation between banks asset quality and operating performance. The research found out that a negative relationship exists between banking operating performance after control of impacts on operating scale and bad asset ratio, idle fund ratio and traditional banking business concentration.

Biru (2021) investigated the determinants of financial performance of private commercial banks in Ethiopia. The study has employed explanatory research design in quantitative research approach. An audited financial statement of private commercial banks was used for the period

2010 to 2019 to carry out the study. The data were analyzed using descriptive and inferential statistics such as correlation analysis, Random and Fixed effect regression analysis. The finding of the study indicates that microeconomic factors such as asset quality had positive and significant effect on return on asset (ROA) & return on equity (ROE) of private commercial banks in Ethiopia. Therefore, the private commercial banks should give due consideration on improving those internal factors since they significantly and positively affect their financial performance.

Adeolu, (2014) carried out a study on asset quality and bank performance on commercial banks in Nigeria and with the use of the Pearson correlation and regression tool of the SPSS for data analysis and concluded that that asset quality had a statistically strong positive relationship and influence on bank performance. However, he also shows that there exists no relationship between bank loans and its profitability though this contradicts Khalid (2012) which reported that asset quality and profitability are negatively correlated in the banking industry

Nzoka (2015) evaluated the effects of assets quality on the financial performance of commercial Banks in Kenya, between the years 2010 to 2014. The study adopted a descriptive design in its methodology and the researcher chose to study commercial banks due to availability of needed data and convenience. All the 43 commercial banks in Kenya were targeted for this study. Secondary data was obtained from annual Central bank of Kenya Banks supervision reports. The analysis showed that all the asset quality factors had a fairly statistically significant impact on financial performance. This was due to the fact that assets quality cannot solely determine the financial performance of commercial banks, unless other factors such as capital adequacy, management efficiency, earnings performance and liquidity are considered.

Kamande (2017) looked at the effects of bank specific factors on the financial performance of commercial banks in Kenya for a period of 5 years, starting from the year 2011 to 2015.

Secondary data published on financial statements of the 11 commercial banks listed in the Nairobi securities exchange for five years from 2011 to 2015 was collected. Data was analyzed using multiple linear regression models to show the effect of bank specific factors on financial performance of commercial banks over that period under study. The results showed that there was positive and significant association between ROA and all the independent factors. The results showed that that asset quality affects profitability and the financial performance of banks.

Kimutai, Jagongo, & Omagwa (2019) evaluated the influence of asset quality on financial performance of commercial banks in Kenya. The study adopted positivist philosophy and explanatory research design. The target population comprised 110 DTS as at 2017. The study used secondary data that was collected from the audited financial statements for the period 2012-2016. Data was collected using a document review guide. Data Envelopment Analysis methodology was used to generate efficiency scores. Both descriptive analysis and inferential statistics which included panel Tobit regression was done and was aided by stata version 11. Descriptive analysis indicates that the mean of asset quality is above the required maximum by the regulator. In addition, asset quality had a statistically significant effect on efficiency.

Cheruiyot (2016) did a study on asset quality and commercial banks' profitability in Kenya. The study was anchored on Signaling theory, modern portfolio theory and capital asset pricing model. The descriptive research design was adopted and targeted a population of all commercial banks licensed to operate in Kenya which was 43 in number. The study was census in nature and made use of secondary data which was collected from published financial reports obtained from various commercial banks and central bank websites. The data was analyzed for descriptive where mean, maximum, minimum and standard deviation was computed and inferential statistics which computed the multiple regression and correlational statistics with the help of Statistical Package

for Social Sciences (SPSS) version 20. The study results were presented in regression equation to reveal the nature of relationship between the study independent variable; asset quality and the dependent variable profitability of commercial banks in Kenya. The study findings suggested as linear association between the variables of the study. This was evident by higher profitability index for the commercial banks with lower ration of non-performing loans.

Kubai (2016) evaluated the impact of non-performing loan portfolio on the operational efficiency of commercial banks in Kenya. In quest to filling this research gap, a mixed research design of exploratory and investigative was adopted. The study targeted all the licensed commercial banks in Kenya and made use of secondary data which was obtained from financial statements obtained from the various commercial banks' website. The study findings were presented in regression equation which showed an inverse correlation of non-performing loans and commercial banks operational efficiency.

2.3.3 Liquidity and Operational Efficiency

Akhter, (2018) did a study which sought to determine the relationship between firm level of operational efficiency and liquidity and the profitability of commercial banks in Bangladesh. The secondary data was employed and selected sample of 30 commercial banks operating in Bangladesh. The study collected data using questionnaire which. To ensure that an informed consent was obtained from the respondent, the research did a letter and also obtained a letter which gave assurances to the respondent that the responses will be confidential and only for research purpose. The findings of the study revealed bank liquidity explained 66% of the operational efficiency while profitability of commercial banks explained 98% of the commercial banks' operational efficiency as shown by the R-square. Beside the maintenance of the minimum level of liquidity, the commercial banks are also required to put into use the customers deposit by

advancing well assessed credit facility on the basis of their quality in order to minimize the risk of non-performing loans.

A study by Alshatti (2015) on the impact of alcohol abuse and how this has affected the profits of thirteen Jordan banks has shown a positive relationship between specific monetary indicators and the profitability of selected banks. In particular, when measuring equity returns, variables such as the investment rate and exchange rate have yielded positive relationships. However, there is a negative correlation between Liquidity and profit when measured in return. This means that it is due to the negligent use of unused deposits. Such quantities do not provide the best interest of banks.

Yuttama, (2020) did a study on the effect of capital, operating efficiency, liquidity, and lock credit on profitability of commercial banks in Indonesia. The inflation level was used as a moderator in the study. The study was descriptive research design in nature and targeted the banking sector in Indonesia upon which sampling was done. The primary data was used which was collected with the aid of structured questionnaire. The data collected related to the five year period between 2014 and 2019. The study utilized purposive sampling to obtain a sample of 43 commercial banks. It was established that capital has a positive and significant impact on the banks' profitability, on the other hand, it was established a negative through insignificant impact of the commercial banks' liquidity and operational efficiency on the profitability of commercial banks in Indonesia.

Odunga and Nyangweso (2014) examined the relationship between bank liquidity, the level of credit risk and firm operating efficiency commercial banks in Kenya. The research was descriptive research design in nature and made use of secondary data collected from the published financial statements from 43 commercial banks for six years between the 2005-2011 financial

periods. The data collected was examined for descriptive statistics in which mean and standard deviation was computed and inferential statistics which involved correlation and regression analysis. The study presented the findings using tables, graphs and charts. The findings of the study exhibited that the operational efficiency of the earlier periods was an important factor in liquidity substitution through the interbank ratio was irrelevant in elucidating operating efficiency.

In another study which was performed by Adam, Safitri and Wahyudi, (2018) which sought to elucidate the impact of the size of the company, the level of liquidity on commercial banks' level of profitability of commercial banks for the firms listed in Indonesian Securities Exchange. It was established that the size of the company had a negative impact on the level profitability.

Muriithi & Waweru (2017) examined the effect of liquidity risk on financial performance of commercial banks in Kenya. The period of interest was between year 2005 and 2014 for all the 43 registered commercial banks in Kenya. Liquidity risk was measured by liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) while financial performance by return on equity (ROE). Data was collected from commercial banks' financial statements filed with the Central Bank of Kenya. Panel data techniques of random effects estimation and generalized method of moments (GMM) were used to purge time-invariant unobserved firm specific effects and to mitigate potential endogeneity problems. Pairwise correlations between the variables were carried out. Wald and F- tests were used to determine the significance of the regression while the coefficient of determination, within and between, was used to determine how much variation in dependent variable is explained by independent variables. Findings indicate that NSFR is negatively associated with bank profitability both in long run and short run while LCR does not significantly influence the financial performance of commercial banks in Kenya both in long run and short run.

However, the overall effect was that liquidity risk has a negative effect on financial performance of commercial banks in Kenya.

In order to avoid any liquidity crisis, central banks and regulatory authorities take strict action to maintain a certain level of liquidity. The banks are liable to maintain a level of liquidity as per requirements of central banks. As a regulatory authority over all banks operating in Pakistan, State Bank of Pakistan has required all banks to maintain a weekly average of minimum 5% Cash Reserve Requirement (CRR) of its total demand liabilities as per its DMMD Circular No. 4 of 2018 issued by the Domestic Market & Monetary Management department of State Bank of Pakistan. Furthermore, the daily average for CRR cannot go below 4% (State Bank of Pakistan, 2018). Policymakers all over the world are suggesting that the banking sector must maintain more liquid assets as compared to the past to hedge against any liquidity crisis. It has led to an international discussion on what can be the standard measures that should be taken and what should be standards to avoid liquidity risk (Basel Committee on Banking Supervision, 2014).

2.3.4 Bank Size and Operational Efficiency

Karray and Eddine Chichti (2013) evaluated the association between the bank size and efficiency of commercial banks in developing countries. The study took a comparison approach of value-added approach and intermediation approach. The study made use of panel data of four years period of 2000 to 2003 from 402 banks drawn from 15 developing countries. The study related bank size to the two measures on banks' technical efficiency which were the scale and technical efficiencies. The study findings revealed that commercial banks have serious hitches relating to the technical inefficiency which encompasses the wastages of bank resources which surpassed the expected level by 46%. The study proved that the decision of adopting the intermediation approach or the value-added approach while evaluating the activity of commercial banks greatly affects the average levels of technical efficiency for all bank size.

Khalil and Khalil (2017) did a study to evaluate the relationship amid the bank size and financial performance of commercial banks in Pakistan. Secondary was adopted using published, audited financial reports belonging to 5 commercial banks in Pakistan. The data collected spanned for a period of eight years from 2007 to 2015. The data was edited and turned into the SPSS. It was then analyzed for descriptive where mean, median and standard deviation were computed and inferential statistics where correlation and ordinary least square coefficients were computed. The finding of the study revealed that the size of the banks is a significant factor in determining the profitability of commercial banks.

Al-khouri (2011) sought to determine the features of the risk that is direct to the performance of the banks by using a sample of forty three commercial banks from six GCC (Gulf Cooperation Council) for the period. The research employed a fixed regression analysis effect on the data and the findings were that the major three types of risk affecting a bank; namely capital risk, liquidity risk and credit risk. The effect was measured using ROA and ROE. The study differs from the present research because it sought to determine the effect of the combined risks to a bank on the performance of a bank and yet the current study will consider only one type of risk credit risk. Further, the study will only concentrate in Kenyan banks and therefore cross-country effect will not be present.

A study was conducted by Ch, (2014) to examine the impact of size of commercial banks of the level of financial performance in India. The financial performance of commercial banks was measured using the Tobin's Q. Correlation and multiple regression analysis was employed in the study. The study used primary data relating to the period between 2009 and 2013 using questionnaire. In another study by Salim (2012) which sought to explain the relationship between bank size and commercial banks' profitability financial performance. The study adopted

descriptive research design and targeted a population of all commercial banks licensed to operate in Kenya which was 43 in number. The study was census in nature and made use of secondary data which was collected from published financial reports obtained from various commercial banks and central bank websites. The data was analyzed for descriptive where mean, maximum, minimum and standard deviation was computed and inferential statistics which computed the multiple regression and correlational statistics. The study results were presented in regression equation to reveal the nature of relationship between the study independent variable; bank size and the dependent variable financial performance of commercial banks in Kenya. The study findings suggested as linear association between the variables of the study.

A study was conducted by Kagecha, (2016) on bank performance. The study collected data relating to the seven years period between 2007 and 2014. The study employed approximation technique in to overcome the endogeneity problem. The empirical findings indicate that for the case of commercial banks in Kenya, size does not matter in determining bank profitability. This suggests that though scale economics are important for profitability, local markets in Kenya do not continuously permit such scale economics to translate to advanced profitability. The control variables covered profitability, market concentration; gross domestic product growth and inflation were all important in elucidating bank profitability.

Teimet, Lishenga, Iraya, & Ochieng (2020) evaluated the moderation effect of firm size on the relationship between revenue diversification and performance of commercial banks in Kenya. The study used unbalanced panel data sourced from Kenya's central bank spanning 2009 to 2018, across 42 commercial banks. Hirschman-Herfindahl model captured the diversification index while return on assets was captured using earnings before interest and tax, over assets. Bank size was proxied using regulatory weighted composite index while the moderation effect was assessed

using Baron-Kenny's model. The study found out that found that the bank size interaction with interest diversification was insignificant meaning the absence of moderation effect. Further, the bank size interaction with non-interest diversification was significant meaning the presence of moderation effect. The results implied that bank size does not moderate the relationship between interest diversification and return on assets; however, moderates the relationship between non-interest diversification and return on assets.

Muhindi & Ngaba (2018) sought to determine the effect of firm size on financial performance of commercial banks in Kenya. To obtain this objective, the study used a descriptive survey. The variables entailed; the number of branches, capital base, number of customer deposit and the loan and advances. The population of the study constituted all the 42 registered commercial banks in Kenya classified in to large, medium and small banks. During the fiscal year ended June 30, 2016, there were 42 commercial banks and 1 mortgage finance company. The data was gathered from the bank's financial reports and central bank supervision reports for 5 years period from 2012-2016. The study established that there is a significant relationship between firm size and financial performance of commercial banks in Kenya. The study revealed that banks that have many branches; huge customer deposits, huge capital base and large loan book have positive and high ROA as opposed to banks who have few numbers of branches, small customer deposits, small capital base and small loan book.

Odunga, (2014) conducted a study to investigate the factors influencing the commercial banks operating efficiency in Kenya. The study made use of the market share index position analysis to determine the efficiency of commercial banks. Explanatory research design was adopted and targeted forty-three commercial banks in Kenya. The data of research interest relate to the six years period. The study used secondary data from published financial statement. The

data collected was analyzed using statistical package for social sciences version 20 for descriptive and inferential statistics. The results show that former year's operating efficiency together with equity capital to total assets as substitution for capital and loan loss provision to net interest revenue as substitution for asset quality were important in elucidating operating efficiency. The results also show that there exists significant difference between low market share banks and high market share banks.

2.5 Conceptual Framework

Conceptual framework refers to the diagrammatic presentation of study variables for ease of understanding the relationship of variables at a glance. The conceptual framework shows the direct connection between the study variables as well as the measurement parameter within each variable. In this case, capital adequacy, assets quality, banks liquidity and bank size were presented as the independent variables while operational efficiency was presented as the dependent variable.

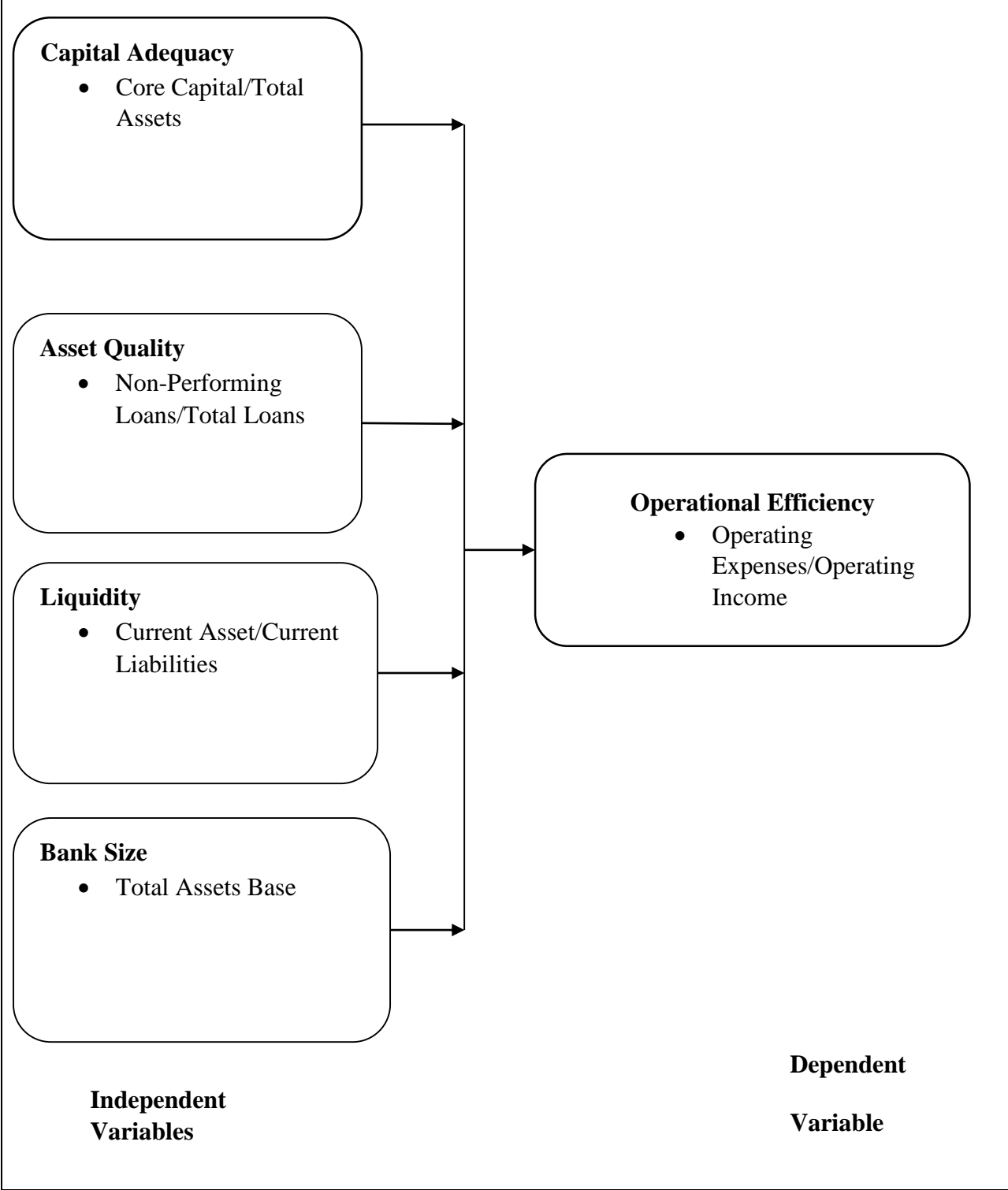


FIGURE 1
Conceptual Framework

2.6 Operationalization of Variables

TABLE 1

Operationalization of Variables

Variable	Variable type	Indicator	Measurement
Capital adequacy	Independent	Core capital/total assets	Ratio
Asset quality	Independent	Non-performing loans/total loans	Ratio
Bank liquidity	Independent	Current asset/current liabilities	Ratio
Bank size	Independent	Total asset base	Ratio
Operational Efficiency	Dependent	Operating expenses/operating income	Ratio

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses research design to be adopted in the study, the target population of the study and the target respondents upon which sampling which be done, size of the sample and sampling procedures, the instrument of data collection and data collection procedure was then be outlined. The chapter further discusses how data collected was analyzed and presented.

3.2 Research Design

This study used descriptive research design. As argued by Lambert and Lambert (2012) descriptive research design refers to an approach that provides at a glance the status of the undertakings and therefore accurately and systematically describe facts and characteristics of a given population or event to ascertain associations between the variables of the study and to permit for future event projection basing on the current understanding (Stangor & Walinga, 2014). The design is deemed appropriate as it allows for explanation of both the independent and the dependent variables. Descriptive research design entails gathering of data to ascertain whether or not, and the extent of relationship exists between two or more variables making it appropriate for this study (Teddlie & Tashakkori, 2009).

3.3 Target Population

As argued by Asiamah, Mensah and Oteng (2017), target population in research refers to the objects and elements having common observable characteristics. The target population for this study was all commercial banks in Kenya. According to Central Bank of Kenya report of 2021, there are a total of 40 commercial banks licensed and operating in Kenya. The researcher targeted the financial records from all these banks.

3.4 Sample Size and Sampling Procedures

Sample size refers to a small unit of population which is preferred because of time, cost, infiniteness and homogeneity. The sampling procedures are the steps which are applied in order to obtain a small unit from a given population, (Asiamah, Mensah & Oteng, 2017). The study adopted a census as a sampling method. All 40 commercial banks in Kenya were targeted since the number is small.

3.5 Data Collection Instruments

Giusti, Capone and Perkins (2013) argued that data collection refers to the procedure in which information is gathered and measured on predetermined variables in a study which enables a person to respond to research questions while evaluating the outcomes. In this study, a data collection form was used by the researcher to collect the required secondary data. Secondary data refers to the already available information collected from firsthand sources for other purposes (Apanasevic, 2018).

3.6 Data Collection Procedure

In this study, secondary data was utilized. The study collected time series panel data for the five years from 2017 to 2021 of all commercial banks on the core capital, total asset base, liquidity ratio, the total loans, total non-performing loans, total operating expenses and the total operating income for a period of five years. The data was gathered through the analysis of published audited financial statements of the banks in the central bank of Kenya bank supervision annual reports available in the CBK website.

3.7 Data Analysis and Presentation

Analysis of data refers to the procedure of examining, transforming, cleansing, and modeling data with an aim to obtaining valuable information to inform conclusion while supporting decision-

making pertaining to a particular phenomenon, (Ghauri, Gronhaug & Strange, 2020). Once the data was collected, it was sorted, cleaned to identify anomaly and incompleteness and comprehensiveness. Coding followed using excel sheet in order to turn into a statistical package for analysis. An analysis was therefore done with the help of Statistical Package for Social Science (SPSS) version 26.0. Descriptive statistics was computed where mean, median and mode while inferential statistics was computed where analysis of variance and regression analysis is done. The study findings were presented using the following linear regression model. According to Seber and Lee (2012) linear regression model is used as a technique to predict the relationship and the direction between the study variables.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where;

Y= Operational efficiency of Commercial Banks

β_0 = Constant term

$\beta_1, \beta_2, \beta_3,$ and β_4 = Beta coefficients

X_1 = Capital adequacy

X_2 = Asset quality

X_3 = Liquidity

X_4 = Bank size

ε = Error term

3.8 Diagnostic Tests

3.8.1 Normality test

To test for normality of distribution, the study used both the graphical method and Shapiro-Wilk analysis. The graphical method plotted data for both independent and dependent variables to observe the data behavior and distribution of whether data is normally distributed. Hanusz,

Tarasinska and Zielinski (2016) argue that Shapiro-Wilk is the most powerful model for testing the normality of data distribution. Shapiro-Wilk measures the proportion of two estimates of the variance of normal distribution based on a random sample of observations.

3.8.2 Autocorrelation Test

Autocorrelation is a measure of the represents the degree of similarity existing between intervals of a series of data and its trailed form of the same data over successive intervals (Gujarati, Basic Econometrics, 2003). The Durbin-Watson test was employed in this study to establish the level of autocorrelation of the study variables. Where the test depicts a statistic ranging between 0 and 4 then the data would then have assumed well auto correlated.

3.8.3 Multicollinearity

Multicollinearity analysis determines the power correlation that exists amid the independent variables in multiple regression models. The assumption is that the variables are not correlated. Where variables are correlated, it is not possible to notice contribution of an individual variable to the changes in the dependent variables because of the severe inflation of standard error of the coefficients (Armor, Cotla & Stratmann, 2017). Even though multi-collinearity may not reduce the predictive power of the regression model, it can produce estimates of coefficients that are not statistically significant (Leeuwenberg, Smeden, Langendijk, Mauer & Schuit, 2021).

To test for multi-collinearity, the study employed tolerance and variable inflation factor (VIF). VIF measures the degree of variance of an independent variable that inflates or influenced by its correlation/interaction with the rest of the independent variables. According to Giacalone, Panarello and Mattera (2018) where there is no problem of multicollinearity, a tolerance value of more than 0.2 and a VIF value of less than 10 are expected.

3.8.4 Heteroscedasticity Test

As defined by Kothari (2014), it refers to a test used to check the level at which variance of errors in a linear regression depend on the values of independent variables. To test this, independent variables regression residual values was adopted and the test was *lrtest*. Where the p-value would be more than 0.05, the heteroscedasticity is deemed fit for the study.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presented the results of the analysed secondary data collected on banks characteristics and operational efficiency of commercial banking Kenya. The banks characteristics considered here as independent variables were capital adequacy, assets quality, liquidity and bank size while the dependent variable was operational efficiency. Secondary data was collected from published financial statement in the central bank of Kenya website on all commercial banks operating income, operating expenses, current assets, current liabilities, non-performing loans, total loans and total assets. This data was then transformed into ratios depicting

4.2 Descriptive Analysis

The descriptive analysis is organized around the five study variables across the five-year period under study. Descriptive research design entails gathering of data to ascertain whether or not, and the extent of relationship exists between two or more variables making it appropriate for this study. The banks analysed decreased from the years 2019 (40 to 39) due to a merger between central bank of Africa and NIC bank.

4.2.1 Capital Adequacy

The study collected data from all commercial banks for a period of five years (2017-2021) on its capital adequacy calculated as a ratio (core capital/total assets). The analysis is shown in Table 2.

TABLE 2
Capital Adequacy

YEAR	N	MIN	MAX	MEAN	SD
2017	40	0.014772	0.45575	0.184025	0.106676
2018	40	0.01357	0.331713	0.149766	0.076398
2019	39	-0.0321	0.428415	0.148419	0.082747
2020	39	-0.25958	0.318091	0.128357	0.092015
2021	39	-0.02346	0.230352	0.121175	0.059206

Source (Research Data, 2022)

From the analysis, the results indicate that in 2017 the banks had the highest level of capital adequacy ratio (0.45575) while the average mean across the banks was 0.184025 with a standard deviation of 0.106676. This was followed by a drop in the year 2018 (Mean 0.149766; SD 0.076398) then a slight increase in 2019 as supported by a mean of 0.148419 and a standard deviation of 0.082747 from the mean. However, as the results indicates in the subsequent years of 2020 and 2021 the bank’s capital adequacy ratio requirement has declined as indicated by a Mean of 0.128357, 0.092015 and standard deviation of 0.121175 and 0.059206 respectively. The trend is also presented in Figure 2.

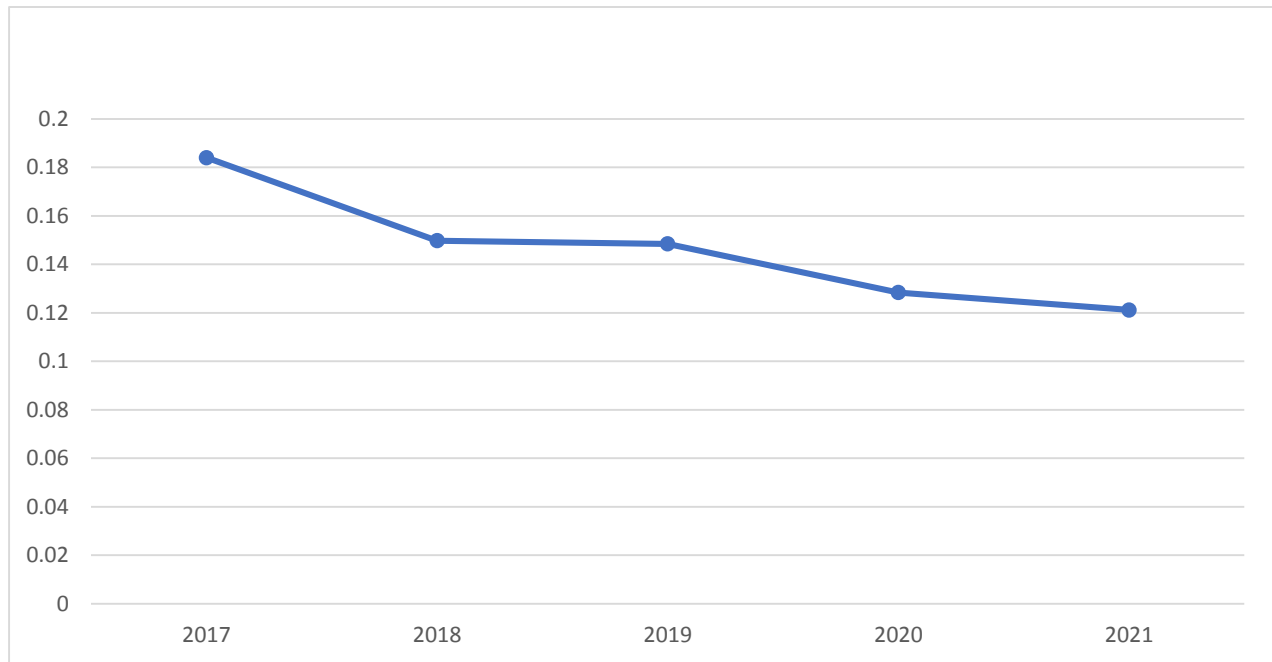


FIGURE 2
Capital Adequacy

Source (Research Data, 2022)

The data in figure 2 indicates that the maximum capital adequacy ratio by the banks was reported in 2017 as indicated by value of 0.45575 while the lowest (0.230352) was reported in 2021. Across the period, only the year 2017 capital adequacy was satisfactory according to the measurement parameter by the central bank of Kenya that a bank’s capital adequacy is fair if it ranges from 0.12 to 0.12.59

4.2.2 Assets Quality

Assets quality is a key component of every commercial bank capacity to operate adequately regardless of the prevailing economic conditions. The study collected data on the asset’s quality of all commercial banks in Kenya for a period of five years (2017-2018). The AQ was calculated as a ratio (non-performing loans/Total assets). The results are presented in table 3.

TABLE 3
Assets Quality

YEAR	N	MIN	MAX	MEAN	SD
2017	40	0.015037	0.875882	0.202454	0.186616
2018	40	0.03005	1.364636	0.203113	4.824394
2019	39	0.009868	0.56502	0.192001	0.143309
2020	39	0.014222	0.761985	0.19802	0.164578
2021	39	0.018971	0.744549	0.187646	0.129809

Source (Research Data, 2022)

From the analysis, the commercial banks assets quality measured as a ratio of non-performing loans/total assets indicates that the assets quality as at 2017 was relative strong as shown by a mean of 0.202454 SD 0.186616 indicating that banks could recover most of their loans issued to clients. However, in 2018, there was an increase of non-performing loans as shown by mean 0.203113 and SD 4.824394 and a drop in assets quality in 2019 (Mean 0.192001, SD 0.143309). However, the banks experienced the worst assets quality in 2020 due to an increase in total loans and decrease in debt defaulting as shown by a mean of 0.19802 and standard deviation of 0.164578. However, in 2021, there was a decrease in non-performing loans indicating a positive trend for the commercial banks' assets quality (Mean 0.187646 and SD 0.129809). This information is also shown in figure 3.

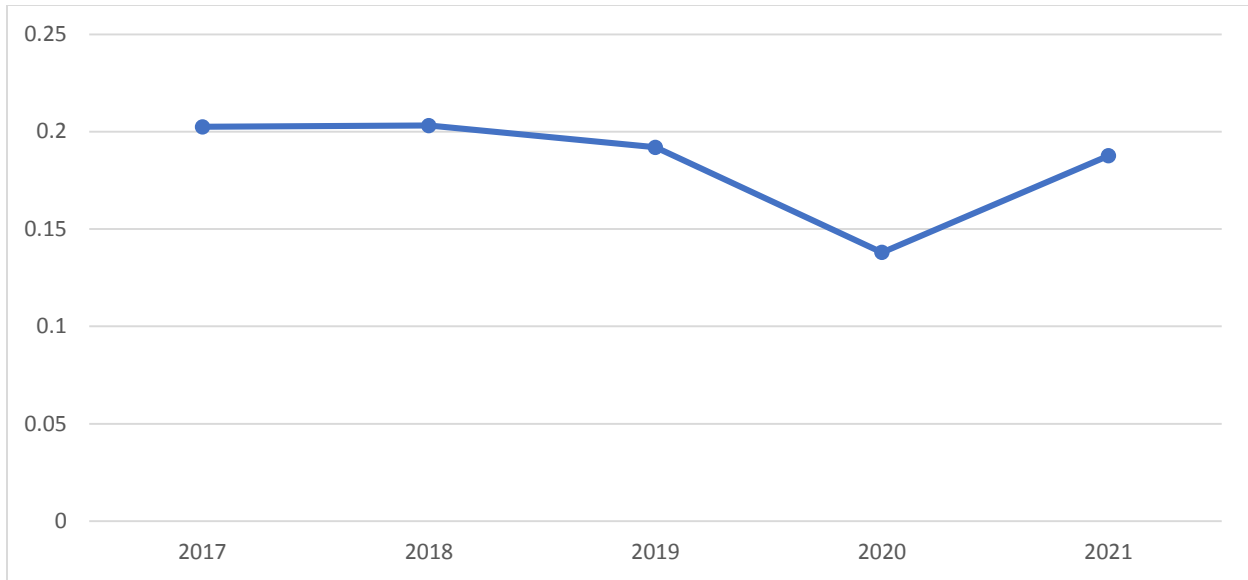


FIGURE 3
Assets Quality

Source (Research Data, 2022)

The data in figure 3 indicates that there was an increase in assets quality from 2017 to 2018 followed by a sharp decline in 2019 and 2020 owing to the economic disruption by the covid-19 pandemic while there has been a recovery in 2021. This indicates that banks are witnessing reduced non-performing loans while increasing their loans portfolio.

4.2.3 Liquidity

Liquidity of bank enables it to meet short-term operations. In this study, liquidity for a period of 5 years (2017-2021) was collected as a ratio of current assets/current liabilities as published in the banks' financial statements. the results are presented in table 4.

TABLE 4
Liquidity

	N	MIN	MAX	MEAN	SD
2017	40	0.3045	0.475	0.39768	0.043978
2018	40	0.305	0.665301	0.455617	0.086071
2019	39	0.305	0.985246	0.435052	0.107662
2020	39	0.224583	0.545	0.399544	0.072898
2021	39	0.335949	0.985246	0.537097	0.143162

Source (Research Data, 2022)

From the analysis, the banks mean liquidity was lowest in 2017 as shown by a mean value of 0.39768 and SD 0.043978. However, there was an increase in liquidity in 2018 ($\mu = 0.455617$; $SD=0.086071$). This indicates that commercial banks were more liquidity and could meet their short-term need for liquid money. There was a slight decrease in liquidity in 2019 as shown by a mean of 0.435052 and standard deviation of 0.107662. This was followed by a further decrease in liquidity in 2020 to a mean of 0.399544 and SD 0.072898 indicating that banks couldn't meet their short-term liquidity adequately as cashflow decreased as there were economic disruptions in the country. Some banks closed their branches while other send home their employees to ease pressure on their current liabilities. However, as at 2021, there was a better performance in all commercial banks' liquidity ($\mu = 0.537097$; $SD=0.143162$). this information is also presented in Figure 4.3

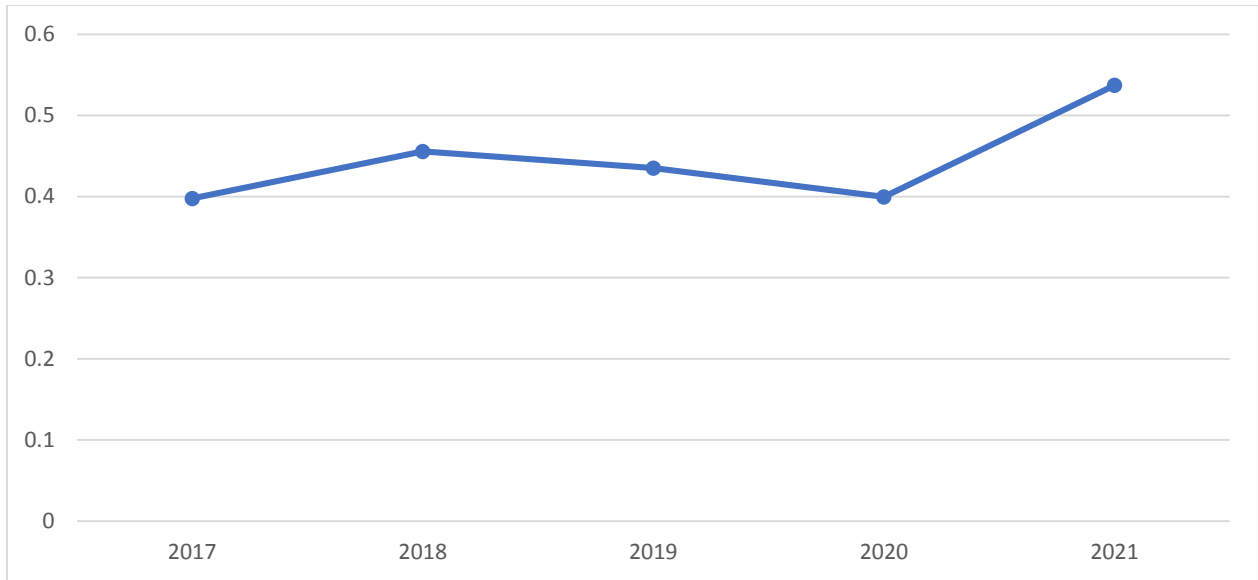


FIGURE 4
Liquidity

Source (Research Data, 2022)

In the findings above, there was an increase in banks liquidity average from 0.39768 in 2017 to 0.455617 followed by a slight drop to 0.435052 in 2019 then further drop to 0.399544 in 2020 and then an improved to 0.537097 in 2021.

4.2.4 Bank Size

Bank size in this study was based on the total assets owned by the commercial banks in Kenya. This data was collected from the central bank annual banking supervision reports for a period of five years (2017-2021). The researcher calculated the minimum, maximum, mean and standard deviation of all values obtained. The results are presented in table 5

TABLE 5
Bank Size

YEAR	N	MIN	MAX	MEAN	SD
2017	40	2610	555630	101263.74	132720.5
2018	40	5360.86	621722.88	112906.22	144312.8
2019	39	6860.3	674301.72	123383.63	167136.5
2020	39	5114	758345	138608.9	189604.1
2021	39	3855	877415	154413.92	218090.2

Source (Research Data, 2022)

From the analysis, the banks total assets averaged 101263.74 million in 2017 and a standard deviation of 132720.5. There was an increase again in 2018 to 112906.22 million and SD 144312.8. there was a further increase from 2018 to 2019 ($\mu = 123383.63$; $SD=167136.5$), a further increase in 2020 ($\mu = 138608.9$; $SD=189604.1$), and 2021 as shown by a mean on 138608.9 million and standard deviation of 218090.2. Across the period, the bank's assets base has increases across the period. This finding indicates a linear increase in banks assets base. Over the years, banks are accumulating assets both current and long term so as to finance their future needs in case of deficits from their daily operations. This information is presented also in figure 5.

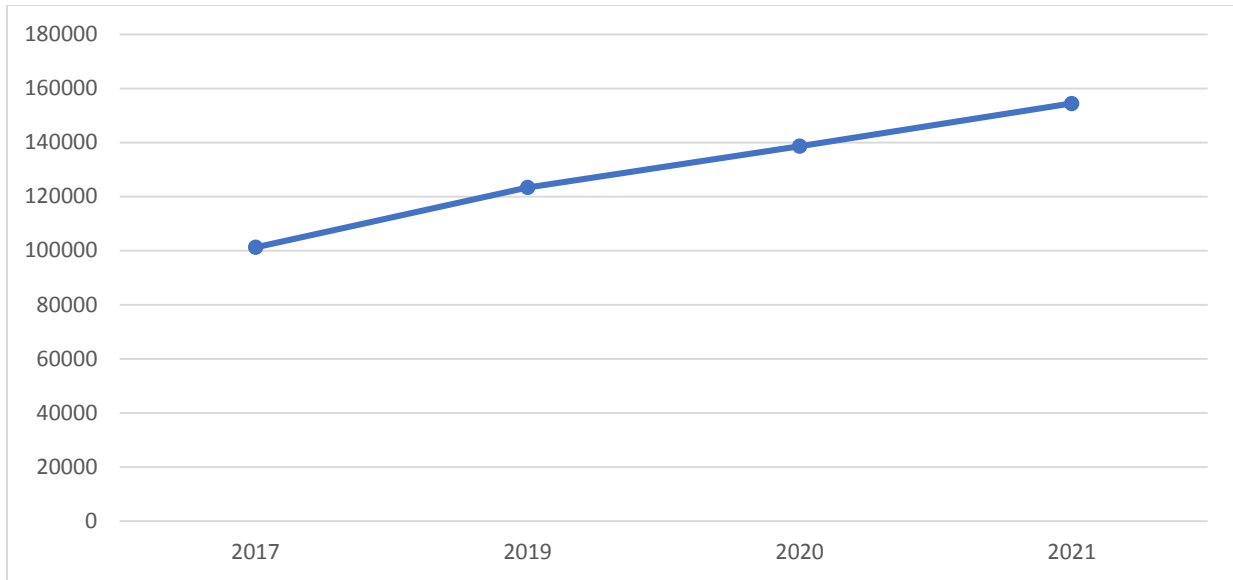


FIGURE 5
Banks Size

Source (Research Data, 2022)

From the findings, there was linear increase in all commercial banks' assets for the entire period of five years (2017-2021). Assets are key in improving the banks share in the market and meeting financial obligation while also improving its operational efficiency.

4.2.5 Operational Efficiency

Operational efficiency is a metric parameter measuring the ability of a bank or any other institution to minimize its resources to generate maximum output. In this study, operational efficiency was calculated as a ratio of operating expenses/operating income for a period of five years (2017-2021) for all commercial banks in Kenya. The results are shown in table 6.

TABLE 6
Operational Efficiency

YEAR	N	MIN	MAX	MEAN	SD
2017	40	0.099897	0.96634	0.537437	0.198701
2018	40	0.154013	0.987646	0.577146	0.237181
2019	39	0.028943	0.997083	0.531765	0.22888
2020	39	0.058003	0.985782	0.524875	0.234204
2021	39	0.039235	0.985246	0.555982	0.220697

Source (Research Data, 2022)

From the findings, the operational efficiency ratio for all banks was at 0.537437 and a standard deviation of 0.198701 in 2017. This was followed by an increase to 0.577146 SD 0.237181 in 2018 and a drop in 2019 ($\mu = 0.524875$; $SD=0.234204$), then a further drop in 2020 ($\mu = 0.524875$; $SD=0.234204$). However, in 2021, the operational efficiency of the banks improved to 0.555982 on average and SD 0.220697 as compared to the previous year. The reflection of this is that banks performed fairly well for the five years but with a poor performance in 2020 when all other parameters indicate low performance. This information is also presented in figure 6.

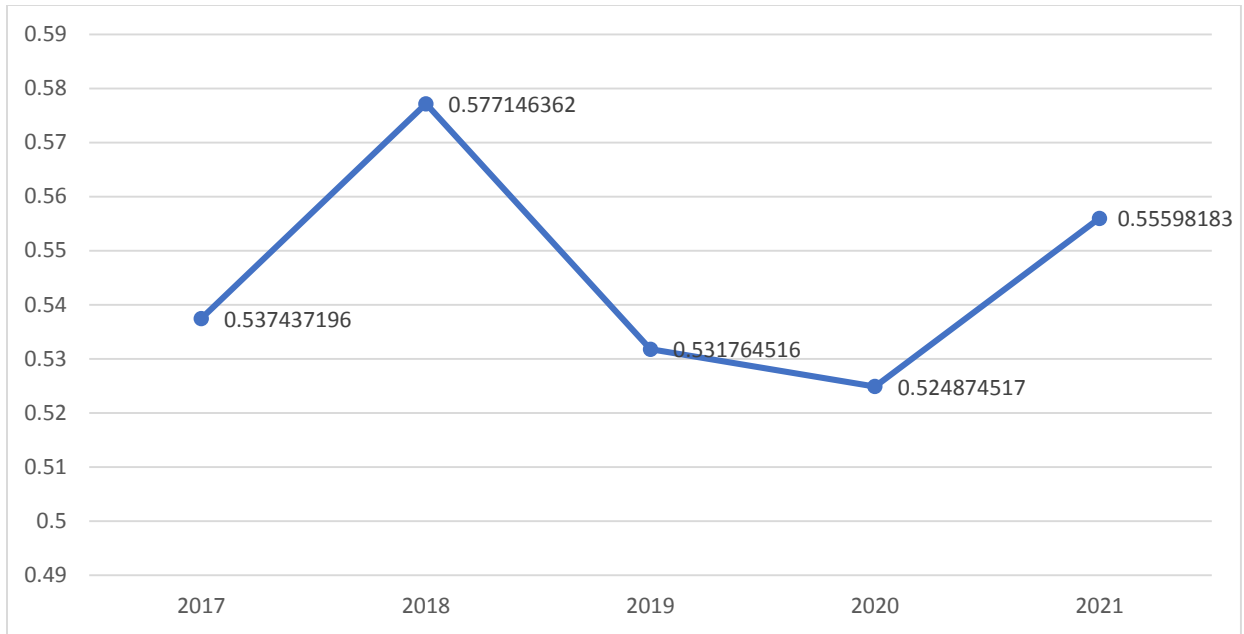


FIGURE 6

Operational Efficiency

Source (Research Data, 2022)

The findings above indicate that there was an increase in operation efficiency from 2017 (0.537437) to 2018 (0.577146) followed by a drop in 2019 (0.531765) and 2020 (0.524875) then an increase to 0.555982 in 2021. This indicates that the banks operated efficiently in the years 2018 and 2021 while there was a drop in its efficiency in 2019 and 2020. The change over the years in operational efficiency could be explained by the expansion of banks branch network and or merging and acquisitions before the outbreak of COVID-19 pandemic and then a drop in 2020 during the pandemic but the analysis of the year 2021 indicates that banks are recovering well and improving their operational efficiency.

4.3 Inferential Statistics

4.3.1 Diagnostic Tests

In this section, the researcher performed diagnostic test on the data to establish if it was valid for further analysis. the test were normality, homoscedasticity, multicollinearity and autocorrelation.

4.3.1.1 Normality Test

Shapiro-Wilk test was adopted in this study to test normality. In Shapiro –Wilk test, if the p values lie below 0.05, then the decision is reached that the data is not normally distributed (Razali & Wah, 2011). Field (2013) on the other hand asserts that statistic vales close to 1 indicate possible normal distribution while statistic values below 0.4 show skewed data. The study null hypothesis stated that the data is not normally distributed. Normality test results were as shown in table 7.

TABLE 7
Normality Test

	Shapiro-Wilk		
	Statistic	df	Sig.
Capital Adequacy	.938	195	.075
Assets Quality	.771	195	.062
Liquidity	.861	195	.052
Bank Size	.958	195	.362
Operational Efficiency	.983	195	.226

Source: (Research Data, 2022)

Observations on market capital adequacy, assets quality, liquidity, bank size and operational efficiency were found to be normally distributed, as indicated by the p-values that are greater than 0.05. therefore, all data was found to be normally distributed. This gave the researcher the go ahead to perform the next test.

4.3.1.2 Homoscedasticity Test

Rucker et al. (2011) describes homoscedasticity as an occurrence in linear regression where the error terms in the relationship between the predictor and dependent variables is the same across all the values of the variables. Levene’s test was conducted to test if the variance between independent

and dependent variables is the same. According to Levene (1960), if the significance is greater than 0.05, the variances are roughly equal and the assumption is tenable.

TABLE 8
Homoscedasticity Test Results

	Levene Statistic	df1	df2	Sig.
Capital Adequacy	2.91	1	195	0.22
Assets Quality	1.46	1	195	0.64
Liquidity	2.32	1	195	0.42
Bank Size	4.51	1	195	0.06
Operational Efficiency	1.69	1	195	0.34

Source: (Research Data, 2021)

The significance level for all the variables was greater than 0.05. Therefore, the variances were significantly equal hence the homoscedasticity was evident. According to Levene (1960), if Levene's test is non-significant ($p > 0.05$), then the variances are roughly equal and the assumption that there is homoscedasticity is tenable.

4.3.1.3 Multicollinearity Test

Variance inflation factor (VIF) and tolerance level are among the suitable tools to test Multicollinearity in a dataset (Cohen & Cohen, 2003). Landau and Everett (2004) describe that, VIF more than 10 and tolerance values below indicates multicollinearity.

TABLE 9
Multicollinearity Test Results

Model		Collinearity Statistics	
		VIF	1/VIF
1	Capital Adequacy	.929	1.076
	Assets Quality	.931	1.074
	Liquidity	.985	1.015
	Bank Size	.871	1.148

a. Dependent Variable: Operational Efficiency

Source: (Research Data, 2022)

Variance inflation factors were in the range of one, meaning that there is no correlation between the predictor variable being considered and the rest of the predictor variables. Therefore, the data did not have any multicollinearity problem.

4.3.1.4 Correlation Analysis

To test correlation between the research variables, spearman correlation was run by the research using SPSS. The spearman correlation uses r values to estimate the level of association between the research variables evaluated using ranked data. The resulted were checked against the spearman table of r values and their level of association between the study variables

Range	Strength
0.00-0.20	Negligible
0.21-0.40	weak
0.41-0.60	Moderate
0.61-0.80	Strong
081-1.00	Very strong

The results of the spearman correlation are as shown in table 10.

TABLE 10
Correlation Analysis

		Capital Adequacy	Assets Quality	Liquidity	Bank Size	Operational Efficiency
Capital Adequacy	Pearson Correlation	1				
	Sig. (1-tailed)					
	N	195				
Assets Quality	Pearson Correlation	.559*	1			
	Sig. (1-tailed)	.017				
	N	195	195			
Liquidity	Pearson Correlation	.513*	-.159	1		
	Sig. (1-tailed)	.023	.225			
	N	195	195	195		
Bank Size	Pearson Correlation	.573*	.462*	.154	1	
	Sig. (1-tailed)	.000	.043	.240		
	N	195	195	195	195	
Operational Efficiency	Pearson Correlation	.502*	.717**	.602*	.813*	1
	Sig. (1-tailed)	.007	.004	.007	.000	
	N	195	195	195	195	195

*. Correlation is significant at the 0.05 level (1-tailed).

Source (Research Data, 2022)

From the analysis, the study identified positive and moderately strong relationship between capital adequacy and assets quality of commercial banks in Kenya as shown by a r value of 0.559 and p value of 0.017 at 95% confidence level. Secondly, as shown by r value 0.513 p value 0.023, there

was a moderate positive relationship between liquidity and capital adequacy. The P value was less than 0.05. In addition, as indicated a ($r = 0.573$; $p = 0.000$) at 95% confidence level, there was a moderate and positive relationship between capital adequacy and bank size measured in terms of assets size. Moreover, a positive and moderately strong relationship was identified between capital adequacy and operational efficiency of commercial banks in Kenya at 95% confidence as indicated by 0.502 r value and 0.007 p value which was less than 0.05.

The study identified a moderately weak positive relationship between bank size measured in terms of assets value and assets quality as shown by r value of 0.462 and p value of 0.043 which was less than 0.05 at 95% confidence level. In addition, there was a positive strong relationship between operational efficiency and assets quality and bank operational efficiency ($r = 0.717$, $p = 0.004$) which was less than 0.05 at 95% confidence level. Liquidity was also found to correlate with banks operational efficiency as shown by $r = 0.602$ and $p = 0.007$ which was less than 0.05 at 95% confidence level. Finally, there was also a very strong and positive relationship between bank size and operational efficiency of banks as identified by r value of 0.813 and p value of 0.000 which was less than 0.05 at 95% confidence level.

4.3.2 Regression Analysis

This study sought to analyse the effect of firm characteristics on operational efficiency of commercial banks in Kenya. The independent variables therefore were capital adequacy, assets quality, liquidity and bank size. The dependent variable was operational efficiency in commercial banks in Kenya.

TABLE 11
Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.264a	.070	.530	.0132959

a. Predictors: (Constant), Capital Adequacy, Assets Quality, Liquidity and Bank Size

Source, (Research Data, 2022)

Model summary in regression analysis points out to the results of goodness fit. R squared is the coefficient of determination. In this study, the coefficient of determination was 0.530. This indicates that 53.0% of variation in operational efficiency in commercial banks in Kenya is explained by independent variables. Therefore, a proportion of 47.0% of variation in commercial banks operational efficiency is explained by other variables not included in this model.

TABLE 12
Analysis of Variance (ANOVA)

ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.321	4	.080	1.765	.002b
Residual	4.277	94	.080		
Total	4.598	98			

a. Dependent Variable: Operational Efficiency

b. Predictors: (Constant), Capital Adequacy, Assets Quality, Liquidity and Bank Size

Source, (Research Data, 2022)

Analysis of variance describes the significance of the overall model. From the results, the F statistic was 1.765. *P value* was 0.002 smaller than the critical p value 0.05. Therefore, the model was significant at 95% confidence level.

TABLE 13
Regression Coefficients

Coefficients					
Model	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
1 (Constant)	.588	.232		2.535	.011
Capital Adequacy	.015	.032	.714	2.476	.013
Assets Quality	.861	.106	.871	2.580	.004
Liquidity	.374	.311	.121	4.205	.031
Bank Size	.451	.036	.128	3.249	.047

a. Dependent Variable: Operational Efficiency

Source, (Research Data, 2022)

Constant for the regression model in this study had a coefficient of 0.588 significant at 95% confidence level ($p \text{ value} = 0.011 < 0.05$). the first independent variable (Capital adequacy) has the lowest coefficient value of 0.015 at 95% confidence level ($P \text{ value} = 0.013$). This means that when adequate capital isn't a big consideration in evaluating operational efficiency of the banks since every bank operates under a mandatory capital ratio by the central bank of Kenya.

Moreover, Assets quality had the highest coefficient value of 0.861 at 95% confidence level and a p value of $0.004 < 0.05$. The core mandate of banks in credit creation form depositors

and must be repaid within the agreed period of time for banks to generate revenue. While executing this function, banks ought to ensure non-performing loans are reduced significantly to improve on its revenue generation. Bank size measured in terms of total assets owned by the commercial banks had a coefficient of 0.451 and p value of $0.047 < 0.05$. This relationship was significant at 95% confidence level. Finally, the value for liquidity was 0.374 and p value of 0.031 at 95% significant level.

Fitting the Regression Model

The regression model for this study was

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where;

Y = Operational efficiency of Commercial Banks

β_0 = Constant term

X_1 = Capital adequacy

X_2 = Asset quality

X_3 = Liquidity

X_4 = Bank size

$\beta_1, \beta_2, \beta_3,$ and β_4 = Beta coefficients

ε = Error term

Based on the significant variables, the fitted model became

$$Y = 0.588 + 0.15X_1 + 0.861X_2 + 0.374X_3 + 0.451X_4$$

Interpretation of the Model

From the results shown in the model, without any intervention identified in this study as independent variables, there is a constant operational efficiency at 0.588. Secondly, at ceteris

paribus, there is a 0.15 change in operational efficiency in commercial banks in Kenya due to a unit change capital adequacy. Moreover, there is a change in banks operational efficiency at 0.861 due to a unit change in assets quality when all other variables are held constant. There is a 0.374 change in banks operational efficiency due to a unit change in banks liquidity level when all other factors held equal. Finally, due to a unit change in banks total assets, there is a 0.451 change in the commercial banks in Kenya operational levels when all other factors are held constant.

4.4 Discussion of the Results

From the analysed data, there is weak relationship between capital adequacy and operational efficiency of commercial banks in Kenya. The coefficient value was 0.15 and the correlation value was 0.502. the findings of this study agree with Nguyen (2020) who evaluated the impact of capital adequacy on bank profitability in the context of Basel II Accord implementation in Vietnam. The results found that bank capital adequacy has a positive impact on return on assets for small-sized banks meanwhile it has no significant impact on profitability for large-sized banks in Vietnam. Secondly, the results were in unison to a study by Musyoka (2017) who looked at the effect of capital adequacy on the financial performance on commercial banks in Kenya. The findings also show that the relationship between bank size and return on assets of commercial banks in Kenya is also negative and significant. However, the findings show that the relation between asset adequacy and ROA of the commercial banks is negative and insignificant while the relation between liquidity and ROA is positive and insignificant.

Secondly, the assets quality is key in determining the operational efficiency of the commercial banks in Kenya as shown by a correlation coefficient of 0.717 and model coefficient of 0.861. This implies that banks should keenly analyse its assets quality as this determines their level of operational efficiency. This finding of this variable agrees with Adeolu, (2014) who carried

out a study on asset quality and bank performance on commercial banks in Nigeria and with the use of the Pearson correlation and regression tool of the SPSS for data analysis and concluded that that asset quality had a statistically strong positive relationship and influence on bank performance.

Liquidity was established to be statistically correlating with operational efficiency in commercial banks in Kenya and this was shown in correlation value of 0.602 and model coefficient of 0.374. this relationship was positive and moderately strong. This finding agrees with a study by Yuttama, (2020) who looked the effect of liquidity, and lock credit on profitability of commercial banks in Indonesia. The findings indicated that capital has a positive and significant impact on the banks' profitability, on the other hand, it was established a negative through insignificant impact of the commercial banks' liquidity and operational efficiency on the profitability of commercial banks in Indonesia.

Bank size evaluated based on the total assets owned by the commercial banks revealed a strong positive relationship with banks operational efficiency as shown by a correlation value of 0.813 and a regression model coefficient of 0.451. Finding agrees with a study done by Karray and Eddine Chichti (2013) who evaluated the association between the bank size and efficiency of commercial banks in developing countries. The study findings revealed that commercial banks have serious hitches relating to the technical inefficiency which encompasses the wastages of bank resources which surpassed the expected level by 46%.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter covers summary of the findings, conclusion and recommendations based on the research findings. The chapter also highlights the findings on the relationship between the independent and the dependent variable, the conclusions from the findings, and the recommendations based on the conclusions which will help commercial banks in Kenya to improve their efficiency.

5.2 Summary of the Findings

The main aim of this research is to examine the effect of firm characteristics on operational efficiency of commercial banks in Kenya. The Summary presented here is based on the four independent variables of capital adequacy, assets quality, Bank liquidity and banks size.

5.2.1 Effect of Capital Adequacy on Operational Efficiency

Capital adequacy of bank enables the institution to run its short-term and long-term operations without interfering with the liquidity. On capital adequacy, the study established that that in 2017 the banks had the highest level of capital adequacy but subsequently the ration has been on the drop with 2020 being the lowest. There was a positive and moderately strong relationship between capital adequacy and banks operational efficiency which was also supported by a strong a positive model coefficient. The findings agree with a study done by Odunga, Nyangweso & Nkobe, (2013) who observed a positive relationship between capital requirement and operational efficiency of commercial banks over a period of five years analysed by the study.

Moreover, the finding agrees with Barus, Muturi, Kibati, & Koima (2017) who did a study to establish the effect of capital adequacy on the financial performance of savings and credit

societies in Kenya. The study employed an explanatory research design. The study results found out that capital adequacy influenced the financial performance of savings and credit societies in Kenya. The Regression results of this study showed that the influence was positive and also showed the magnitude by which capital adequacy influenced the financial performance of savings and credit societies.

5.2.2 Effect of Asset Quality on Operational Efficiency

The analysis on this variable showed that there was an increase in assets quality from 2017 to 2018 followed by a sharp decline in 2019 and 2020 owing to the economic disruption by the covid-19 pandemic while there has been a recovery in 2021. This indicates that banks are witnessing reduced non-performing loans while increasing their loans portfolio. The regression model and the correlation analysis indicated a positive relationship between assets quality and banks operational efficiency. The findings on this study variable agree with Nzoka (2015) who did a study to evaluate the effect of assets quality on performance of commercial banks in Kenya. Performance was evaluated based on return on assets. The study established there was a positive and significant relationship between the size and quality of the assets and the banks financial performance.

5.2.3 Effect of Bank Liquidity on Operational Efficiency

The banks liquidity was evaluated as a ratio of current assets and current liabilities. The study found out that liquidity was lowest in 2017 as shown by a mean value of 0.39768. However, there was an increase in liquidity in 2018 ($\mu = 0.455617$) followed by a slight decrease in liquidity in 2019 ($M = 0.435052$) was followed by a further decrease in liquidity in 2020. However, as at 2021, there was a better performance in all commercial banks' liquidity ($\mu = 0.537097$). The liquidity therefore showed a variance across the five-year period and the correlation and the model indicated a positive and significant relationship between banks liquidity and operational efficiency. This was also revealed by Majakusi (2016) who evaluated the effect of liquidity management on financial

performance of commercial banks in Kenya. The author found a statistically significant and positive relationship between liquidity and commercial banks profitability and the ability to meet their short-term need for cash.

5.2.4 Effect of Bank Size on Operational Efficiency

Bank size was evaluated based on the total assets owned by the banks. The study found out that there was a linear increase in the bank's assets across the five years the analysis was undertaken from 2017 at 101263.74 million to 138608.9 million in 2021 on average. Over the years, banks are accumulating assets both current and long term so as to finance their future needs in case of deficits from their daily operations. In correlation analysis, assets base had the highest coefficient giving a positive and strong relationship between the assets base of a bank and its operational efficiency.

These results were reflected by Muhindi & Ngaba (2018) who sought to determine the effect of firm size on financial performance of commercial banks in Kenya. The study established that there is a significant relationship between firm size and financial performance of commercial banks in Kenya. The study revealed that banks that have many branches; huge customer deposits, huge capital base and large loan book have positive and high ROA as opposed to banks who have few numbers of branches, small customer deposits, small capital base and small loan book.

5.3 Conclusion

The study concludes that there is a positive and strong relationship between capital adequacy and operational efficiency of commercial banks in Kenya. When commercial banks accumulate more capital, they create a portfolio that can be used to provide credit to different sectors of the economy and would therefore reap well through interests on loans.

Secondly, banks assets quality has a positive relationship with operational of commercial banks. The non-performing loans has been a key detriment to commercial banks effort in providing credit and earn form the venture but with the ability to determine Portfolio at Risk (PAR) there is

now a reduced level of non-performing loans. With increase in credit extension by commercial banks, the probability of non-performing loans and provision for bad debts in the balance sheet increases. This put pressure on the commercial banks assets and affects the rate at which the banks offer services to their clients. When non performing asset to net assets ratio is lower, asset quality of Commercial Banks in Kenya is high and this implies a positive trade-off between assets quality and profitability.

On liquidity, the study concludes that commercial banks liquidity has strong effect on operational efficiency. The banks short term assets are essential in enabling firms in meeting short term financial needs. Meeting short term obligation is a prerequisite for any bank to operational efficiently, this implies that the bank should be able to pay off its creditors and meet other expenses.

The study concludes that there is a strong positive relationship between bank size measured in terms of total assets and operational efficiency. When banks have adequate assets both short term and long term, they are able to meet all operational expenses hence improve on their efficiency.

5.4 Recommendations

From the study conclusions, the study makes the following recommendations

Capital adequacy is key in determining the operational efficiency of commercial banks in Kenya. Therefore, the study recommends that commercial banks should strategize to increase their core capital as this will avail more funds for lending which is the key banking function. Lending will earn the bank interest hence improve their operational efficiency.

Secondly, the banks should improve on their mechanism on credit analysis of all borrowers before extending credit as well as undertaking the Portfolio at Risk (PAR). This will ensure only

credit worth borrowers have been given credit, will repay on time and hence reduce the nonperforming loans which negatively affects assets quality and the banks operational efficiency.

Liquidity determines whether the banks stay afloat in different economic conditions. Therefore, the bank management should be keen to ensure an optimal liquidity ratio as this ensures adequate liquid to meet daily financial needs while also investing their extra liquidity into income generating short term ventures

Bank size is key in determining how they offer their services to clients. The study recommends that the Treasury and the bank managers should establish a should framework to ensure the commercial banks have enough assets to sail through the unstable economic conditions in the financial sector. The assets will able banks meet their operational cash needs, invest adequately and make profits.

5.5 Suggestion for Further Research

Since the regression model shows that only 53.0% of commercial banks operational efficiency is determined by the selected independent variables in the study, another study can be done using other variables. Secondly another study can be done on the same variables and include a moderating effect brough by age of the bank.

5.6 Limitations of the Study

The study data was collected and analysed for a period of five years which is relatively a short period of time. If another study could be undertaken for a long period pf time say ten years the results could be different such as leverage, bank age and mergers and acquisition. Secondly the study did not consider macro environment factors that have an effect on the bank's operational efficiency.

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APPENDIX I: DATA COLLECTION SHEET

Years	Bank Liquidity $\frac{\text{Current assets}}{\text{Current liability}}$	Bank size (Asset base in millions)	Capital adequacy $\frac{\text{Core capital}}{\text{Total Assets}}$	Asset quality non – performing loans Total loans	Operational efficiency $\frac{\text{Operating Expenses}}{\text{Operating income}}$
2017					
2018					
2019					
2020					
2021					

APPENDIX II COMMERCIAL BANKS IN KENYA

1. Victoria Commercial Bank Ltd
2. UBA Kenya Bank Ltd
3. Trans-National Bank Ltd
4. Standard Chartered Bank Kenya Ltd
5. Prime Bank Ltd
6. Paramount Universal Bank Ltd
7. Oriental Commercial Bank Ltd
8. NIC Bank Ltd
9. National Bank of Kenya Ltd
10. Middle East Bank (K) Ltd
11. K-Rep Bank Ltd
12. Kenya Commercial Bank Ltd
13. Jamii Bora Bank Ltd
14. Imperial Bank Ltd
15. I & M Bank Ltd
16. Habib Bank Ltd
17. Habib Bank A.G. Zurich
18. Gulf African Bank Ltd
19. Guardian Bank Ltd
20. Giro Commercial Bank Ltd
21. First Community Bank Ltd
22. Fina Bank Ltd
23. Fidelity Commercial Bank Ltd
24. Family Bank Ltd
25. Equity Bank Ltd
26. Equatorial Commercial Bank Ltd
27. Ecobank Kenya Ltd
28. Dubai Bank Kenya Ltd
29. Diamond Trust Bank Kenya Ltd
30. Development Bank of Kenya Ltd

31. Credit Bank Ltd
32. Co-operative Bank of Kenya Ltd
33. Consolidated Bank of Kenya Ltd
34. Commercial Bank of Africa Ltd
35. Citibank N.A. Kenya
36. Chase Bank (K) Ltd
37. CFC Stanbic Bank Ltd
38. Barclays Bank of Kenya Ltd
39. Bank of India
40. Bank of Baroda (K) Ltd
41. Bank of Africa Kenya Ltd
42. African Banking Corporation Ltd