

**EFFECT OF ASSET BASED FINANCING ON  
LOAN PORTFOLIO PERFORMANCE IN  
COMMERCIAL BANKS IN KENYA**

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## DECLARATION

This research project is my work and it has not been submitted in any university for an award of merit.

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This research project has been submitted with my approval as the university supervisor.

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Last but not the least, to the Almighty God who provided me a complete quantum of enablers to accomplish this study. I will always praise and adore you.

## **DEDICATION**

I wish to dedicate this academic work to my wife Lucy, daughter Josephine and sons Clifford & Alban who respectfully excused my leave of indulgence during the time I was conducting this study. To my mother, brothers and sister for as your last born you guided me through facets of life. A special mention though goes to my elder brother Samson, whose love for education propelled me to keep moving on this educational journey.

## TABLE OF CONTENT

<b>DECLARATION.....</b>	<b>ii</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>iii</b>
<b>DEDICATION.....</b>	<b>iv</b>
<b>TABLE OF CONTENT.....</b>	<b>v</b>
<b>LIST OF TABLES .....</b>	<b>viii</b>
<b>LIST OF FIGURES .....</b>	<b>ix</b>
<b>ABBREVIATIONS AND ACRONYMS.....</b>	<b>x</b>
<b>ABSTRACT.....</b>	<b>xi</b>
<b>CHAPTER ONE: INTRODUCTION .....</b>	<b>1</b>
1.1 Background of the Study .....	1
1.1.1 Asset-based Financing .....	2
1.1.2 Loan Portfolio Performance.....	3
1.1.3 Asset-based Financing and Loan Portfolio Quality .....	3
1.1.4 Commercial Banks in Kenya .....	4
1.2 Research Problem .....	5
1.3 Research Objective .....	7
1.4 Value of the Study .....	7
<b>CHAPTER TWO: LITERATURE REVIEW.....</b>	<b>9</b>
2.1 Introduction.....	9
2.2 Theoretical Review .....	9
2.2.1 Financial Intermediation Theory.....	9
2.2.2 Commercial-Loan Theory.....	11
2.2.3 Credit Market Theory .....	12
2.3 Determinants of Loan Portfolio Performance in Commercial Banks .....	13

2.3.1 Customer Deposits .....	13
2.3.2 Liquidity Management .....	14
2.3.3 Firm Size .....	15
2.3.4 Firm Profitability .....	15
2.4 Empirical Studies .....	16
2.5 Conceptual Framework .....	20
2.6 Summary of Literature Review .....	20
2.7 Research Gaps .....	22
<b>CHAPTER THREE: RESEARCH METHODOLOGY .....</b>	<b>23</b>
3.1 Introduction .....	23
3.2 Research Design .....	23
3.3 Population .....	24
3.5 Data Collection .....	24
3.6 Data Analysis .....	24
3.6.1 Diagnostic Test .....	26
3.6.2 Test for Significance .....	26
<b>CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSIONS .....</b>	<b>27</b>
4.1 Introduction .....	27
4.2 Tests of Normality .....	27
4.3 Descriptive Statistics .....	28
4.4 Pearson Product Moment Correlation Coefficient .....	29
4.5 Regression Analysis .....	30
4.6 Discussion of Findings .....	32

<b>CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND</b>	
<b>RECOMMENDATIONS.....</b>	<b>35</b>
5.1 Introduction.....	35
5.2 Summary of Findings.....	35
5.3 Conclusion .....	37
5.4 Recommendations.....	38
5.5 Limitations of the Study.....	38
5.6 Suggestions for Further Research .....	39
<b>REFERENCES.....</b>	<b>40</b>
<b>APPENDIX: SECONDARY DATA.....</b>	<b>43</b>

## LIST OF TABLES

Table 4.1: Normality Tests .....	27
Table 4.2: Descriptive Statistics .....	28
Table 4.3: Correlation Analysis .....	30
Table 4.4: Summary of the Model .....	31
Table 4.5: ANOVA.....	31
Table 4.6: Model Coefficients .....	31



## LIST OF FIGURES

Figure 2.1: Conceptual Framework .....	20
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## **ABBREVIATIONS AND ACRONYMS**

<b>ABF</b>	Asset Based Financing
<b>CBK</b>	Central Bank of Kenya
<b>CRBs</b>	Credit reference bureaus
<b>FSD</b>	Financial Services Deepening
<b>KDCI</b>	Kenya Deposit Insurance Corporation
<b>MFBs</b>	Microfinance Banks
<b>MRPs</b>	Money Remittance Providers
<b>NPLs</b>	Non-Performing Loans

## ABSTRACT

Today, commercial banks are appreciating the significance of asset-based financing and reduced risk associated with an asset-based financing while considering increasing the amount of the credit line in their loan portfolio as a method of improving the loan portfolio performance. The objective of this study was to determine the effect of asset-based financing on performance of loan portfolio among commercial banks in Kenya. The study utilized a descriptive research design to test hypothetical relationships amongst variables. This research was guided by the following theories: Financial Intermediation Theory, Commercial-Loan theory and Credit Market Theory. The population comprised of 43 commercial banks as at 31st December, 2017 that were operational in the study period. Secondary sources of data spanning for a period between 2012 and 2016 were used. Diagnostic tests and descriptive statistics were carried out afterwards inferential statistics: correlation analysis and regression analysis were applied in hypothesis testing. From the descriptive results, the study concluded that the study variables: mortgage outstanding, customer deposits, bank size, profitability and liquidity recorded significant increases in the duration of the study. These increases were largely attributed to use of technology and innovation and continuous training and development programs. Correlation results depicted a weak and moderate correlation between size of the bank and loan portfolio. There lacked a correlation between mortgage outstanding, ROA, customer deposits, liquidity with loan portfolio. Regression model utilized under the study was found to be significant. Bank size and mortgage outstanding were statistically significant while customer deposits, liquidity and ROA were insignificant. Thus, the study recommends that need for commercial banks to effectively employ credit policies to minimize non-performing loans and default risks. It would also be necessary for commercial banks to continue investing in modern technologies such as information communication technologies so as to boost efficiency and minimize operational costs. The main limitation for this study was that the researcher utilized secondary sources of data which could easily get altered and manipulated and thus impact negatively on the findings. Due to resources and time constraints, this study was limited to duration of 5 years only. Future researchers should think of doing a replica of this research covering a longer period of time like 20 years, this way the researcher can accurately be able to detect nature of existing relationships amongst variables.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

Economists in the world accentuate that human needs are unlimited whereas the world's resources are limited (Parkin, 2018). People, therefore, strive to gather as many resources as possible to help them meet their needs. In most cases, however, it is not possible for one to get everything they need within the timeframe needed which creates the need for one to take credit facility. Commercial banks offer a simple way for people to access the resources needed to meet their needs and pay back with an interest which is contributory to the profit, as a spread for banks (Grzywacz & Handlowa, 2016).

The theories guiding this study included Financial Intermediation Theory, Commercial Loan Theory and Credit Market Theory. Honohan (2013) maintains that financial Intermediation Theory is regarded as a practice by which customer deposits money in commercial banks, then this money is lend to borrowers who repay it with an interest. Commercial loan theory puts more emphasis on the need for depositors to continue depositing money so as to enable to lend money to borrowers. Banks sees opportunity in lending money for viable ventures and opportunities that promise higher returns (Hu, 2011). Credit Market Theory is built on the assumption that lending rate is the sole determinant of loan amounts which are distributed by commercial banks provided there is collateral and strict adherence to credit policies (Guerrieri & Lorenzoni, 2017).

In Kenya, most commercial bank customers lack sufficient financial statement information to support their loan application and this hinder them from accessing loan. However, loan based financing is a concept that commercial banks need to consider as an alternative form of financing to their customers (Owino & Otieno, 2013). Mwanzia and Sakwa (2017) depict that loan based on assets improve the quality of loan portfolio and thus it can be used as a source of financial information to support loan application.

### **1.1.1 Asset-based Financing**

Asset-based financing refers to a type of credit acquired from the commercial banks and other lending facilities which requires one to give valuable items such as property as security to the credit taken (Smith, 2016). In most cases, the value of the item given as security is higher than the amount of financing institution offers to the individual or organization. The practice is common following the need for commercial banks to mitigate on the credit risk and at the same time afford credit to the rather opaque and non-financial statements transactional borrowers. Despite the provision of collateral, the financing institution observes the creditworthiness of the person by checking in the credit report agencies and bureaus for instance Credit Reference Bureau (CRB) that issue the credit rating scores. The bank in this case, therefore, takes a calculated risk by lending the credit to someone and awaits the payment when the credit gets due (Mwaurah, 2013).

Commercial banks also have strategies on follow-up and enforcement to the person they lend to ensure that the credit is paid. In the case of asset-based financing, the commercial institution can recover their amount through the auction and foreclosure in case the creditor declines to make payment (Roberts, 2014).

Asset-based financing is measured based on the total amount of loans offered to individuals and organizations on which an asset was given as collateral (Bandyopadhyay, 2016). Regardless of the form of lending given by the commercial banks, all the loans are elements of the loan portfolio of the individual bank.

### **1.1.2 Loan Portfolio Performance**

The loan portfolio is an integral asset to the commercial bank and comprises of the total number of loans that have been acquired from the bank as well as the interest earned. In the valuation of the loan portfolio for any bank, the value included needs to inform the likelihood that the loan will be paid. The constitution of the loan portfolio, therefore, can be included as a sum of the principal borrowed, the interest earned, and the creditworthiness of the person taking the loan (Bandyopadhyay, 2016). The eminence of a loan portfolio, therefore, is assessed by the ability of the individuals to pay their loans together with the interests thereby reducing the risk taken by the commercial bank (Grippa & Gornicka, 2016). The banks are aware of this concept and therefore, set loan portfolio management strategies that will help them distribute the loans while reducing the risk of non-performing loans (NPLs) (Abata & Adeolu, 2014).

### **1.1.3 Asset-based Financing and Loan Portfolio Quality**

The function of the banks is centered on the financial intermediation theory of banking. According to this theory, the lenders of money in the bank are not the bank itself but the people who make deposits in the banks (Lewis, 2016). The clients deposit the money in bank accounts and create a pool of money which will be available for lending. The borrowers, on the other hand, get the money through the bank in the form of loans. Therefore, the bank, in this case, acts as an intermediary

between the lender and the borrower. Banks, therefore, avoid making losses in the process through strategies such as securing the loan with a collateral that the bank will acquire in case the borrower defaults in payment. The concept, therefore, forms the basis for asset-based financing which has been adopted by almost all the banks in Kenya. The relational theory of secured finance also captures the contribution of asset-based financing among the commercial banks and other lending institutions (Scott, 1986).

According to the theory, the relationship between the lender and the borrower is distinctive and well established, however, the time when one changes their behavior and decides not to pay the debt is unpredictable (Gorton, 2015). Asset-based financing presents a method that can be used to not only secure the loan and ensure that the debtor pays but also a strategy to get the amount back if it is not paid. Additionally, the scaled down efforts on monitoring as aided by the Asset Based Financing (ABF) helps commercial banks reduce on their structural and agency costs (Abata & Adeolu, 2014). Through this strategy, the commercial banks will be able to maintain a high performing loan portfolio and remain profitable. Asset-based financing contributes to the creditworthiness of the individuals which in turn affect the quality of the loan portfolio (Rampini & Viswanathan, 2017).

#### **1.1.4 Commercial Banks in Kenya**

Commercial banks in Kenya have been successful in providing credit to the borrowers in different perspectives. The credit given constitutes the loan portfolio. Asset-based financing, however, takes the greatest proportion of the loan portfolio making up to 40% of the total loan portfolio in 2017 (Central Bank of Kenya, 2017). The number of non-performing loans in the commercial banks is however significant

each year and affects the value of the loan portfolio. An improvement in the loan portfolio leads to increased profits in the commercial banks. Since the commercial banks find it attractive to make the profit, they issue loans to the borrowers increasing their loan portfolio and profit.

The overall observation of risks facing the banking sector is that while market risk can be easily managed through hedging activities, credit risk has emerged as a new management challenge to financial institutions (Pilbeam, 2018). According to the results of the risk management survey by the Central Bank of Kenya, the sector largely operates under the traditional model with collateral being the most popular credit risk mitigation technique. Creditworthiness is, however, a factor of consideration in determining the loan portfolio quality which when not considered could lead to an increase in non-performing loans. Asset-based financing, therefore, intervenes, in this case, to help reduce the amount of non-performing loans which is a factor in the loan portfolio.

## **1.2 Research Problem**

Based on the annual reports from the central bank of Kenya (CBK) there has been a substantial growth in the loans distribution in the years 2017 increasing the loan portfolio value to Ksh. 2.4 trillion towards the end of the year. Despite this increase, the amount held in the non-performing loans was also significant at Ksh. 234.5 billion in the year 2017 (Central Bank of Kenya, 2017). The non-performing loans have a great influence on the quality and value of the loan portfolio. The implication is that as the amount offered in form of loans increases there is a substantial increase in the risk prevalence of loans not being paid. The defaulter shown by non-performing loan increases and the total effect was expected to be a negative impact on the loan portfolio for the commercial banks.



Loan portfolio managers have therefore embarked on issuing the asset-based finances in the market to help in reducing the risk in case the client's defaults in payment of the acquired loans. Despite these efforts, there are also some asset-based loans which comprise the non-performing loans in commercial banks. For instance, in the year 2016, 31% of the total mortgage that was offered to the creditors ended up in bad debts (Central Bank of Kenya, 2017). Consequently, most commercial banks in Kenya have a high value in their loan portfolio but it is affected by the creditworthiness of the individual leading to a high risk.

Asset-based financing, however, intervenes in these cases to reduce the risk by either ensuring that the amount is paid by the client or through the acquisition of property offered as collateral during lending. The practice could serve as one important method of controlling the cost of non-performing loans which alter the quality of the loan portfolio. A good loan portfolio is beneficial to the citizens of the nation since more credit will be available which will foster development. Poor loan portfolio leads to financial institutions not being able to offer more credit to people fearing the possibilities of losses (Bandyopadhyay, 2016). In the light of the need for commercial banks to realize profits through lending, and maintain the quality of the loan portfolio, portfolio managers are faced with a huge challenge when making lending decisions. Every manager strives to maintain a high performing loan portfolio which comprises of substantial credits offered at an interest with a high likelihood that the loans will be paid back. Most managers appreciate the use of asset-based financing since it provides collateral which should be withheld until the loan has been cleared (Smith, 2016). As a result, the view is just based on the loan and the need to ensure it is paid.

The managers look at the individual loans without an appreciation of what asset-based financing does to their loan portfolio. A research gap, therefore, exists that would define the relationship between the asset-based financing and the performance of the loan portfolio for the commercial banks. Based on the gap identified the study sought to answer the research question of what role does asset-based financing play in influencing the performance of the loan portfolio for commercial banks in Kenya.

### **1.3 Research Objective**

To establish the contribution level of the asset-based financing on loan portfolio performance in commercial banks in Kenya.

### **1.4 Value of the Study**

The results of this study will contribute to the identification of better methods of managing the loan portfolio. The achievement will be actualized based on an understanding of the relationship between asset-based financing and the routine of the loan portfolio. Additionally, the results will inform on the role of asset-based financing in promoting the well-being of the loan portfolio and identify its contribution to effective loaning and managing of the non-performing loans in the commercial banks. The loan portfolio is the main asset owned by the commercial banks and its proper management is integral to the performance of the entire bank. This research will provide an insight of the asset-based financing techniques and the effect they have on the loan portfolio performance to aid the managers in making sound decisions when loaning. The research, therefore, will serve as an eye-opener to the bank managers who make a lending decision and inform whether or not increasing the asset-based loans would help in improving the performance of the loan portfolio.

The study findings will also be used for further research on improving loan portfolio performance for commercial banks and recommendations that will be drawn will be used by other banks when developing and designing their frameworks for diversification. The development of policies and designs that considers asset based financing as a safer mode of financing will help in reduction of the number of non-performing loans and increase the profitability of the commercial banks significantly. The banking sector will therefore be able to make informed decisions following the results of this study and reduce potential for economic losses.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter will review the various theories that explain the operations of the commercial banks and the inclusion of the asset-based financing in their operations. There will be an empirical review of the quality of the loan portfolio following different lending practices. The chapter is organized with the theoretical review coming at the beginning followed by the empirical review. A conceptual framework that will describe the relationship between different variables and finally a summary of the literature review which identifies the existing research gaps.

#### **2.2 Theoretical Review**

##### **2.2.1 Financial Intermediation Theory**

Financial intermediation defines a practice through which the clients deposit funds in the commercial banks which then lend to the borrowers who have to make repayments as an interest (Rampini & Viswanathan, 2017). Honohan (2013) distinguishes the financial intermediaries using four criteria in the first category comprise of the liabilities specified for a fixed sum that is not related to the portfolio performance. In the second category are short-term deposits with a shorter term than their assets.

The third category comprises of the chequable deposits that can be introverted on demand and the fourth category are those involving assets and liabilities that are not transferable (MacDonald, 2015). As intermediaries, commercial banks strive to maintain a steady flow of funds between the deficit units. They act as intermediaries through the creation of specialized financial commodities and selling them at prices

that cover all the production cost as well as opportunity costs. The interest charged by the commercial banks on the principal is, therefore, a profit that is equivalent to the opportunity cost of investing the amount in another venture (Gorton, 2015).

The entrepreneurs seeking the financing from the commercial banks have well-developed ideas on how they are to spend the amount and the mode of payment they are going to employ (Hisrich, Peters, & Shepherd, 2017). In this instance, the person borrowing from the commercial bank has defined collateral that they are willing to offer as security for the loan. The projects being executed have high returns that will enable the entrepreneur to meet the cost of paying back the loan as well as support the needs of the organization (Roberts, 2014). The people who make the deposits, in this case, are the real lenders who issue the amount through the commercial banks hence the name financial intermediary.

The commercial banks, therefore, do not loan their own money to the borrowers, the real lender is the person who deposits the amount with the commercial bank. At times the client will come back and seek to withdraw the amount that was deposited. The client, in this case, has the right to their money regardless of whether the amount is stuck in the loan or it's available in liquidity form. In such a scenario the commercial bank needs to have a mechanism of acquiring enough money to pay the withdrawals at any given time. The loaning process, therefore, needs to be done in a sound manner that would ensure this balance (Bandyopadhyay, 2016). In this realization provision of disposable collateral becomes necessary before lending to any individual which leads to asset based financing.

### **2.2.2 Commercial-Loan Theory**

The theory takes the form of the commercial bank's operations and how they try to maximize utility from the deposits made by their clients. According to the theory, clients continue to make deposits in the banks which creates a pool of money that the bank uses to lend the borrowers in form of loans and gaining the interest (Hu, 2011). The commercial bank, however, does not operate as a warehouse for storage and lending of cash to willing persons. In some instances, the banks find attractive ventures that need urgent financing and would realize huge profits. In this case, they take the loans from the amount deposited and invest in the profitable business for the short period (Bandyopadhyay, 2016).

In performing the operations, the bank is aware that the loan cannot be liquidated easily to get the cash back. On the other hand, the client who deposited the cash could be willing to withdraw the amount at any time which is highly unpredictable. Since the bank needs to make the profit and also maintain the client relations when the client withdraws the money from the bank, the commercial banks, in this case, are forced to take a form of a loan that is self-liquidating. The self-liquidating loan is a type of loan that is secured by assets which can be sold at any time to repay the loan (Parkin, 2018). This type of loan comprises a form of asset-based financing that takes the asset as security in case the investment does not bring in enough amounts to pay out the withdrawals or the amount of liquid cash reduces substantially following the withdrawals.

### **2.2.3 Credit Market Theory**

The credit market theory presumes that the lending rates are the only determinant of the amount of loan distributed by the commercial bank sector as long as collateral and other important restrictions are constant. Therefore, based on the law of demand and supply, when the demand for credit increases the supply remains the same which makes the interest rates to rise. Other risks associated with the credit, therefore, are computed to the lending rates to arrive at a justifiable value of the risk against the gains from the credit. The additional risks of default are determined through the risk premium. Consequently, there is a direct correlation between the interest rates charged and the probability of the borrower to default the loan. The indication here is that as the potential for default increases on the side of the borrower the interest rates charged also increases significantly. Guerrieri and Lorenzoni (2017) hypothesized therefore that higher premiums are generally driven by higher failure risk.

Even though the theory does not recognize the importance of collateral in lowering the risk premium, it is usually expressed that when someone with a low credit security wants to increase the amount of loan offered such that they are at the same level with the low-risk borrower, the collateral plays an important role in lowering the risk premium making them able to acquire huge credit. This realization leads to the moral hazard and adverse selection phenomena. Since there is non-uniformity in information between the borrower and the lender, such that the borrower has more information on the type of risk they are going to engage in which gives them the freedom to take higher risks without the knowledge of the lender. The adverse selection problem appears as the lenders increase the interest rates substantially to provide security for themselves against default. This consideration makes them attract the high-risk borrowers and reduce the low-risk borrowers from their portfolio.

## **2.3 Determinants of Loan Portfolio Performance in Commercial Banks**

The value of the loan portfolio comprises the value of the principal, the total interest earned and the creditworthiness of the members taking the loans. Loan portfolio quality, on the other hand, is the measure of the likelihood that the loans taken from the bank are going to be paid. The quality value is determined by the number of non-performing loans in the loan portfolio. The number of non-performing loans exhibits an inverse relationship with the loan portfolio quality. The performance of the loan portfolio is dependent on the loan portfolio quality which is determined by a variety of factors. There are several determinants of loan portfolio performance of commercial banks; they include customer deposits, liquidity management, firm size and firm profitability.

### **2.3.1 Customer Deposits**

Customer deposits are funds from customers that is held by a bank. It is a liability to the bank. Mwaurah (2013) found a significant relationship between customer deposits and loan portfolio. Banks that have large deposits are likely to offer loans in order to earn an interest from deposits. Nakayiza (2013) also found that a rise in bank deposit results into improved bank profitability. It was discovered that when bank deposits increased bank capital also increased.

An increase in bank capital in turn created an opportunity for banks to generate more income through increased loan facilities among other services. Eventually, the banks experienced an increase in the level of profit. Therefore, an increase in deposits led to an increase in profit levels. Bank deposits have a direct positive relationship with the level of profitability of banks. Accordingly, an increase in the value of bank deposits leads to increased revenue generating activities for banks further enhancing their



profit levels. In contrast, a study conducted by Rahaman and Akhter (2015) revealed that non-performing loans impacted negatively on customer deposits. A conclusion was drawn that over dependence on time deposits and savings deposits led to poor loan performance. As such, when customer deposits declined this impacted negatively on loan performance portfolio.

### **2.3.2 Liquidity Management**

Rasiah (2010) indicate that banks need to maintain a minimum level of liquid and illiquid assets. This is aimed at ensuring that banks are liquid in order to meet their financial compulsions. This way, they are able to service loan. When banks hold high levels of liquidity, they can easily consolidate sufficient funds to invest in other liquid assets as well as raise funds efficiently from other sources so as to meet their financial commitments timely. Commercial banks regulators dictate that banks must hold liquid assets to effectively conduct their operations. A bank is liquid if it accumulates sufficient funds and its capability to source funds from different sources to meet their financial needs. When a bank is faced by financial difficulties, it might be forced to raise more funds through the process of borrowing or disposing some liquid assets which might create an impression to investors that the bank could be disposing bad assets. Thus, attract lower prices for liquid assets which might expose the bank to loss of income from the sale of liquid assets (Donadelli, 2015).

### **2.3.3 Firm Size**

Large firms are more advantage as compared to smaller firms for example, they enjoy discounts from purchasing items in bulk and thus operate at an average costs. Smaller firms reports high levels of profitability as compared to large firms. This is because large firms can easily access debts and thus prefer to finance their investments using debt. Servicing debt is too expensive, and this might expose the firm to financial losses. Smaller firms are unstable and thus might not be able to service debt (Lewis, 2016).

Lust and Blume (2016) indicate that firms that hold a huge asset base can easily service debt since they are stable. This argument has been supported by Bandyopadhyay (2016), who argues that large firms recorded a better credit history as compared to smaller firms since they were more stable. MacDonald (2015) defines firm size based on the average assets held by the firm. Nkurrumah (2014) demonstrates of an existence of a significant relationship between size of the firm and loan portfolio.

### **2.3.4 Firm Profitability**

Penman (2007) explains that profitable firms have capacity to service debts. Profitability is achieved through effective firm management which involves cost minimization, investing in innovation and information technology. Pandey (2005) argues that profitable firms invest in advanced technology to be able to offer superior products and services compared to their rivals. This results into increased customer satisfaction which leads to an increase in sales and firm profitability. Profitable firms easily get loans and finances from financial institutions.

Managers' aim at achieving firm profitability while stakeholders to maximize shareholder's wealth. In most cases, managers prefer to retain earnings in the firm as opposed to paying dividends to the shareholders. Shareholders are more satisfied when the firm distributes all its earnings to the shareholders as dividends unlike investing in projects that have a positive net present value. Person and Kumar (2010) insist that shareholders prefer debt financing since it limits the managers from excessive cashflows. This induces the management to be more efficient and innovative in order to minimize operational costs so as to meet debt covenant.

## **2.4 Empirical Studies**

Most studies on banking problems or challenges world over have indicatively shown poor loans (asset quality) to be the key factor of bank failures for instance Onuonga, (2014) stressed that between 2005 and 2010, the spate of bad loans otherwise referred to as non-performing loans in Nigerian Commercial Banks was as high as 35%.. (Paul Kiama Thiongo, 2016) conducted a research on the impacts of the loan portfolio to the performance of commercial banks in Kenya. The research was guided with the objective of examining the effects of the growth of loan portfolio on the economic performance of commercial banks in Kenya. The study sampled a total of 20 commercial banks in Kenya which were sampled through an applied scientific random sampling technique.

The study examined five independent variables which include asset quality, liquidity management, capital adequacy, and the growth in loan percentage which contributed to an increase in the loan portfolio growth and how they affected the financial performance of the commercial bank. The study results showed that there is a strong correlation between the growth in the loan portfolio and the financial performance of

the commercial banks. The research is necessary since it shows the significance of the growth of the loan portfolio to the commercial bank which makes it necessary for the banks to manage their loan portfolio as an asset.

In December 2013 Nakayiza (2013) conducted a cases study on the centenary bank in Entebbe to investigate the effects of interest rates on loan portfolio performance in commercial banks in Uganda. The study was guided by the objective of examining how the centenary bank was able to maintain its loan portfolio within acceptable limits which enhanced its performance as well as examine how the bank worked out problems with loans in order to boost its performance. The study included 73 respondents selected at random from the employees of the centenary bank. The employees cut across from the top executive to the subordinates and were subjected to a structured interview and the data was collected. The results of the study showed that there was a steady increase in the interest rates of the banks in Uganda. Additionally, the value of the loan portfolio was also on the increase while the number of non-performing loans exhibited a reducing trend. This is an indication that the performance of the loan portfolio was on the increase as new policies and strategies were being employed.

In another study conducted by Nkurrinah (2014) on the factors affecting non-performing loans in Kenya which took a case study of commercial bank of Africa conducted in the period 2013-2014, the study was based on the objective to determine the factors influencing the non-performing loans and was conducted on a randomly sampled size of 122 employees from the population of 451 staff of the commercial bank of Africa in Kenya. The study collected data using semi-structured questionnaires which were administered to the sample and responses were recorded

and later subjected to analysis. The results of the study showed that 10.4% of the total loans given by the bank were nonperforming due to poor monitoring, additionally, the results showed that 49.7% of the respondents believed that proper credit management strategies are the best method for combating the problem of non-performing loans.

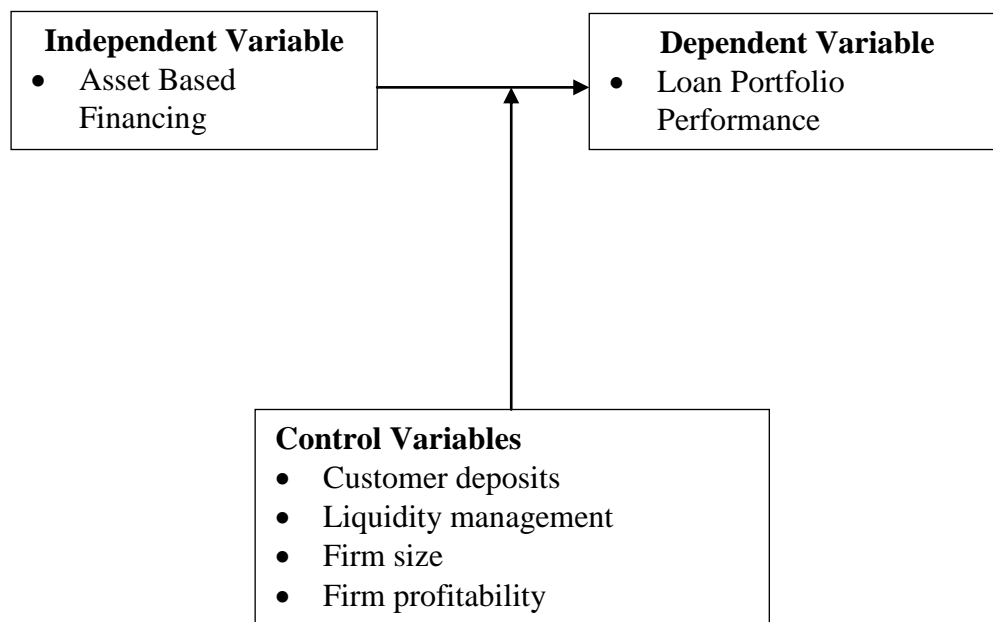
The non-performing loans affect the loan portfolio performance significantly. Asset-based financing is one of the main strategies employed to ensure that the risk is managed and reduce the chances of non-performing loans. Mwanzia & Sakwa (2017) conducted a research on the influence of liquidity on loan portfolio performance among some selected commercial banks in Kenya. The research was intended on testing the hypothesis that there is no statistically significant influence of liquidity on loan portfolio in the commercial banks. The study was conducted on a sample of 176 respondents comprising of 16 respondents selected from 11 banks countrywide. The data was collected through structured questionnaires and secondary data. The data were analyzed using qualitative and quantitative analysis which used the analysis of variance. The results of the study showed that there was a strong negative relationship between liquidity and loan portfolio performance in the banks.

According to research conducted by Kakozi (2017) on the factors affecting the bank asset quality in Tanzania for the period 2006-2013 the study sampled a total of 49 banks in Tanzania which is also equal to the total number of commercial banks in the country. Secondary data was collected for the period and subjected to analysis which included a regression analysis to arrive at the regression equation. The results of the study showed that the non-performing loans had the greatest negative impact on the loan portfolio. The study also defined the loan portfolio as the main asset for the bank that is influenced by different external factors in the operating economy.

In another research conducted by Ochola (2013) on the determinants of business collaterals and loan portfolio quality of commercial banks in Kisumu municipality, the research was aimed at meeting the objective of determining the relationship between business collateral and loan portfolio quality. The study was conducted on the entire population which comprised of the 30 commercial banks in Kisumu municipality. The study utilized both primary and secondary data which was collected using structured questionnaires. The study results showed that the determination of the asset to be offered as collateral included items such as the amount involved, the timeframe within which the loan needs to be paid, the creditworthiness of the individual as well as the ease of liquidating the collateral in case of default.

Abata (2014) delved asset quality and bank performance for the commercial banks in Nigeria. The study was conducted in the period 2013-2014 and was aimed at testing the hypothesis that there is no relationship between asset quality and bank performance. In the study, all the banks in Nigeria were included and data were collected using the available records in the Nigerian stock exchange. The study results showed that there was enhanced reduction of the bad debt when the loans were secured with an asset unlike in the case where the loans were not secured. Moreover, the assets were liquidated to obtain the cash for the non-performing loans which resulted in a positive contribution to the loan portfolio for the commercial banks. The study, therefore, acknowledged the significance of asset-based financing in sustaining the value of the loan portfolio.

## 2.5 Conceptual Framework



**Figure 2.1: Conceptual Framework**

Asset-based financing is the independent variable that acts on the loan portfolio performance to exhibit a causal relationship between the two variables.

## 2.6 Summary of Literature Review

Several theories have been used to explain the role of the commercial banks in providing the finances to borrowers on demand. The theories also show the different financial implications on the loan portfolio of the banks following their lending activities. However, there is also an emphasis on the need for the commercial banks to give credit since it is their primary mandate and a method of contributing positively to the loan portfolio. The employment of the theories links to the performance of the loan portfolio since they explain the lending relationship and repayment strategies which are essential elements in the loan portfolio.

The financial intermediary theory plays an important role in explaining why the commercial banks need to offer loans despite the risk involved. Additionally, the hypothesis also explains the reason why the commercial banks need to be strict on the loans they offer to the clients to ensure that they are paid when they are due. The hypothesis claims that the banks take the risk of lending the money which is given by the depositing clients to the borrowers and make their profits through the interest charged on the amount. The client who deposits the amount, however, would need to withdraw at their convenience and the commercial bank needs to ensure that they have the liquid cash to pay the withdrawals. Since loan defaulters are inevitable the bank needs to employ security measures such as asset-based financing to ensure that they can liquidate the asset at any time and get the loan paid.

The commercial loan theory also explains the importance of asset-based financing in the commercial bank and how it makes it possible for the banks to make a profit by taking advantage of any arising opportunities. The hypothesis also explains the importance of asset-based financing in securing the loans since the liquidation of the loan is not possible and the asset can be easily liquidated to obtain the cash back and help in maintaining the stability of the operations in the bank. Securing the loans is therefore seen as a perfect method of ensuring that the loan portfolio quality is maintained substantially.



## **2.7 Research Gaps**

There are many types of research that have been conducted on the various factors that affect the loan portfolio performance and quality. The researches main focus is on the contributing factors that lead to the advancement of the loan portfolio. The research can be attributed to the appreciation of the loan portfolio as the main asset for the commercial banks. Despite the need to increase the loan portfolio, the number of nonperforming loans is also alarming and therefore need to be controlled. Strategies put in place mostly focus on the creditworthiness of the individual. The loans offered whether nonperforming do not offer an option for being liquidated faster. A research gap, therefore, is available on the need to find a better way of giving self-liquidating loans that would contribute to a stable loan portfolio.

The management of the loan portfolio is an important concept for any bank. Most of the institution, however, continues increasing the value of their asset without proper mechanisms to reclaim the loans offered to the commercial institution. However, based on the commercial loan theory a perfect strategy for the liquidation of the amount given in the loan is presented. In case the bank is overwhelmed by the loans the assets are easily liquidated to seal the gap. The concept has been employed by some commercial banks and has realized certain impacts on the loan portfolio. Previous researches have however identified the importance of non-performing loans on the quality of the loan portfolio. A research gap, however, exists on how to manage the non-performing loans as a strategy to advance the quality of the loan portfolio. This research, therefore, addresses the gap of managing the loan portfolio through the provision of asset-based financing as a self-liquidating loan that will help in controlling the level of non-performing loans.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter outlines the research design that was used in the research, the target population, sampling technique, and sample size data gathering procedures, data examination and the statistical model that was employed.

#### **3.2 Research Design**

The researcher employed a quantitative type of research design of a correlational type. The choice of the correlational design was informed by the existence of two variables that affect each other. The correlation design, therefore, is essential in defining the nature of the relationship and how one variable affects the other (Lust & Blume, 2016). The study utilized secondary sources of data on commercial banks including asset-based financing that was later used to define the relationship involving loan portfolio quality.

The choice of secondary data was informed by the availability of recorded financial statistics that were reliable and easy to access. Data collected was quantitative in nature and this informed asset-based financing loans offered by commercial banks. The possibility to default and monitoring the performance of the portfolio was based on the definition of loan portfolio quality that included the value of total loans that were distributed, their interests and possibilities of loans being paid back.

### **3.3 Population**

The population targeted all 43 commercial banks in Kenya that were involved in the provision of asset-based finances to individuals and groups. This study was limited to Commercial Banks and thus included lending institutions that offer asset-based financing in Kenya. Since the study population was small, the entire population was studied.

### **3.5 Data Collection**

The study employed quantitative data that was obtained from secondary sources. This source of data was got from financial reports of all commercial banks that handled asset-based financing including annual reports from Central Bank of Kenya (CBK). The information gathered entailed total loans offered by commercial banks as well as values and the total number of defaulters established through non-performing loans, the amount of asset-based finances given and the total number of defaults that arise from asset-based finances. Ultimately there was data collected on the type of assets given and number of non-performing loans that arose from each loan. This information was useful in achieving the study objectives and addressing the research question.

### **3.6 Data Analysis**

The quantitative data gathered was subjected to different types of analysis that were useful in describing the relationship between variables. Descriptive statistics such as the mean, mode, median, skewness, range and standard deviation was used to describe the characteristics of data collected for further analysis. The analysis included a Pearson Product Moment Correlation Coefficient analysis that was done to explain the link between variables such as the relationship between loan portfolio performance and asset-based financing.

Additionally, an ANOVA test was conducted to compare the variation in the means of the populations in the case of asset-based financing and the other forms of loans as well as the amounts involved. The choice of ANOVA was informed by the presence of more than two data sets.

There was a significance test that was conducted on the data. Since the data set is 43 which is more than 30 the significance test to be conducted will be the z-test which is appropriate for a large amount of data (Films Media Group, 2016). Ultimately regression analysis was done to define the relationship between identified variables. The regression analysis was conducted to show the relationship between the independent variables and the dependent variable. The equation was as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Where;

Y = Loan portfolio will be measured using non-performing loans divided total gross loans and advances

X<sub>1</sub> = Asset based financing was measured using total outstanding mortgage loans

X<sub>2</sub> = Customer deposits was measured using loan amounts in the study period.

X<sub>3</sub> = Liquidity management was measured using current assets dividend by current liabilities

X<sub>4</sub> = Firm size was measured using natural logarithm of assets.

X<sub>5</sub> = Firm profitability was measured using ROA.

$\alpha$  = Regression constant

$\varepsilon$  = Error term

$\beta_1 \beta_2 \dots \beta_n$  = coefficients of variation

Where Y was the loan portfolio value, A was the number of nonperforming loans, B

was the coefficient of variation, C was constant value of the intercept and X was the asset-based financing loans offered. The value of constant C was influenced by other variables that worked to influence the relationship between asset-based financing and total non-performing loans.

### **3.6.1 Diagnostic Test**

A diagnostic test for the conditions necessary for the regression analysis was done. Normality test was also conducted to check outliers, and this was carried out by the use of Shapiro-Wilk test. These data was tested to find out whether it had homoscedasticity.

### **3.6.2 Test for Significance**

There was significance test that was conducted on the data. Since the data set was 43 which was more than 30, thus the researcher conducted z-test since it's appropriate for large amounts of data (Films Media Group, 2016). This test was conducted using SPSS version 24.

## CHAPTER FOUR

### DATA ANALYSIS, RESULTS AND DISCUSSIONS

#### 4.1 Introduction

Descriptive statistics enables the researcher to have a clear picture concerning the pattern and trend of study variables over a period of study. And this makes it easy to present data in a manner that is easy to interpret and comprehend. With descriptive statistics, the researcher can easily generalize the study population. This chapter provides a discussion of diagnostic tests based on statistical assumptions of regression analysis and descriptive statistics on asset-based financing on performance of loan portfolio among commercial banks in Kenya.

#### 4.2 Tests of Normality

Normality tests were carried to establish whether data set was well-modeled in a normal distribution and to compute the possibility for a random variable that underlie the data set to be distributed normally. The results are shown in Table 4.1.

**Table 4.1: Normality Tests**

	Tests of Normality					
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Loan portfolio	.206	170	.170	.898	170	.538
Mortgage outstanding	.183	170	.200*	.903	170	.271
Customer deposits	.247	170	.056	.831	170	.421
Liquidity	.395	170	.093	.669	170	.550
Firm size	.272	170	.054	.625	170	.065
ROA	.397	170	.701	.639	170	.207

The results in Table 4.1 show that all the study variables are normally distributed since their level of significance (p-values) exceeds 0.05, (0.538, 0.271, 0.421, 0.550, 0.65 & 0.207, respectively).

### 4.3 Descriptive Statistics

Descriptive statistics involves measures of central tendency; mean and standard deviation, maximum and minimum as well as skewness. Mean is a central value of a set of numbers, it measures central tendency which is used to describe typical values. Standard deviation is the spread of values in a sample and skewness measures whether the data is symmetry or not.

**Table 4.2: Descriptive Statistics**

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. deviation</b>	<b>Skewness</b>
Loans and advances	170	-613.00	411666.00	47344.12	68879.08272	2.441
Mortgage outstanding	170	.00	65554.00	5268.37	11165.37	3.372
Customer deposits	170	-43.75	8.39	-.1565	3.95	-8.082
Liquidity	170	.00	.84	.22	.11	1.375
Bank size	170	3.42	5.74	4.57	.57	.245
ROA	170	-.32	.08	.0195	.03936	-3.912

In Table 4.3, the findings show that loan portfolio of commercial banks increased from KES. -613 to KES. 411,660 with a mean of KES. 47344.117 and a minimal standard deviation of 68, 879.0827 implying that loan portfolio among commercial banks were less spread out. These implied that commercial banks increased their provision for loans and advances over the study period. Similarly, mortgage financing increased from KES.00 to KES.65554, with a mean of KES. 5268.37.

The highest value of KES. 65554 largely deviated from the mean of KES. 5268.37.

This was an indication that commercial banks issues different amounts of mortgage financing to their customers. Customer deposits increased from -43.75% to 8.39%, these imply that most bank customers made more deposits in the study period. Customer deposits recorded a negative level of skewness which was an indication that customer deposits among commercial banks was less spread out.

Liquidity recorded a significant increase whereby the highest value was recorded at 0.84 and the lowest value at 0.00. This was an indication that most commercial banks met their financial duties in the study period. Bank size increased from a minimum value of 3.42 to a maximum value of 5.74, implying that commercial generated more assets in the study period, with a mean of 4.57 and standard deviation of 0.57, which signaled that most commercial banks did not deviate largely from the mean since on average they recorded an increase in assets. ROA increased significantly during the study period from -.32 to 0.8 implying that commercial banks utilized their assets to generate profits. Commercial banks recorded an average ROA of 0.0195 and skewness of -3.912 meaning that it was less spread out.

#### **4.4 Pearson Product Moment Correlation Coefficient**

Correlation analysis was utilized to demonstrate the strength of relationship between variables. Strength of association amongst variables was postulated by Pearson correlation scale in which the values between, 0.0 – 0.3 depict that there lacks any correlation, 0.31 – 0.5 depicts a weak correlation, 0.51 – 0.7 depicts a moderate correlation and between 0.71 – 1.0 depicts that there is a strong correlation between the variables. The results are illustrated in Table 4.3.



**Table 4.3: Correlation Analysis**

	Loans and advances	Mortgage Outstanding	Customer Deposits	Liquidity	Firm Size	ROA
Loans and advances	1					
Mortgage Outstanding	.187*	1				
Customer Deposits	-.017	.039	1			
Liquidity	-.018	-.110	.168*	1		
Firm Size	.436**	-.027	.039	.126	1	
ROA	.209**	-.219**	-.008	.105	.506**	1

In Table 4.3, the results showed existence of a moderate correlation between size of the firm and loan portfolio (R=0.436). The findings further show non-existence of correlation between mortgage outstanding, profitability, liquidity and customer deposits (R= 0.187, R=0.209, R= -0.018 & R= -0.017, respectively).

#### 4.5 Regression Analysis

A regression analysis was used to establish the link between asset-based financing and loan-portfolio performance. It was expected that there was a relationship between the variables. Having firm performance of loan portfolio as dependent variable and asset-based financing as predictor variables, the outcome of the regression is reflected below:

**Table 4.4: Summary of the Model**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.476a	.227	.203	64467.85

a. Predictors: (Constant), ROA, customer deposits, liquidity, mortgage outstanding, firm size

This shows that asset-based financing only account for 22.7% of the variance loan portfolio of commercial banks.

**Table 4.5: ANOVA**

Model	Sum of Squares	Df	Mean of Square	F	Sig.
Regression	199711282720.362	5	39942256544.072	9.611	.000 <sup>b</sup>
Residual	681600960113.658	164	4156103415.327		
Total	881312242834.020	169			

a. Dependent Variable: Loan portfolio

The outcome depict that the model employed is statistically significant: F (5, 164) =9.611 and a p-value of .000 (<0.05).

**Table 4.6: Model Coefficients**

Model	Unstandardized Coefficients		Standardized coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-188842.58	48185.59		-3.919	.000
Mortgage Outstanding	1.34	.45	.212	2.986	.003
Customer deposits	-477.54	1150.09	-.029	-.415	.679
Liquidity	-38624.75	47372.02	-.058	-.815	.416
Firm size	51867.68	10647.64	.407	4.871	.000
ROA	96466.91	147686.8	.056	.653	.515

Regression equation resulting from this study is as follows:

$$\text{Loan portfolio} = -188842.58 + 1.34X_1 + 51867.68X_2 + \varepsilon$$

Customer deposits, liquidity and ROA were excluded from the regression equation since they were statistically insignificant. Mortgage outstanding, firm size and ROA were positively linked to commercial banks' loan portfolio (1.34, 51867.68 & 96466.91, respectively). This meant that a single unit increase of any of these parameters resulted into an increase in commercial banks' loan portfolio. Customer deposits and liquidity were inversely linked to commercial banks' loan portfolio (-477.54 & -38624.75, respectively). This meant that a unit increase in these variables resulted into a corresponding decline in loan portfolio. Mortgage financing and size of the firm were significant given that their probability values were below 5%, (0.003 & 0.000, respectively). But then again, customer deposits, liquidity and ROA were insignificant because their probability values surpassed 5%, (0.679, 0.416 & 0.515, respectively).

#### **4.6 Discussion of Findings**

Descriptive findings revealed that loan portfolio increased significantly during the period of study. Consistent to these findings is Abata and Adeolu (2014) who discovered that loans and advances increased in the study duration. This increase was attributable to commercial bank stability and successful adoption of credit policies.

Mortgage financing increased by a significant margin in the course of the study, supporting these observations is a study by Guerrieri and Lorenzoni (2017), who established that banks issued more mortgages during the study period. This was as a result of successful adoption of credit policies and reduced risk of default.

Similarly, the study established that bank profitability, liquidity and customer deposits increased by a significant margin in the period of study. These results are line with the views of Grzywacz and Handlowa (2016), who also revealed that liquidity, bank size and customer deposits recorded significant increases in the study period. These increases were greatly enhanced by use of banking technologies such as ICT, innovation and continuously training and development programs. Majority of the commercial banks reported profits during the study due to improved efficiency, cost reduction and provision of superior products and services that served the growing needs of customers for example mobile banking and internet banking among others. These views are in tandem with the observations by Thiongo et al. (2016) who found attributed improved bank performance; increase in profitability, bank deposits and liquidity to huge investment in technology, innovation and training and development programs.

Findings of correlation analysis established existence of a weakly moderate association between size of the bank and loan portfolio. In view of this is a study by Grippa and Gornicka (2016), who found an existence of a moderate relationship between size of the bank and loan portfolio. However, there was no correlation between bank profitability, liquidity, mortgage financing and customer deposits as evidenced by Bandyopadhyay (2016). Contrary to this are the observations by Fahlenbrach, Prilmeier and Stulz (2017), who found a strongly moderate association between mortgage financing and loan portfolio. But, there was lack of correlation between customer deposits, liquidity and ROA with loan portfolio.

Overall regression equation was statistically significant as evidenced by the observations by Abata and Adeolu (2014), who concluded that the regression equation was statistically significant. It was further established that ROA, liquidity and customer deposits were insignificantly linked to loan portfolio.

These observations are contrary to those of Fahlenbrach et al. (2017), who discovered that liquidity and customer deposits were significantly related to loans and advances. Kiama and Thiongo (2016), on the other hand supported these findings as this study found existence of an insignificant association between liquidity and profitability with loan portfolio.

Bank size and mortgage financing linked significantly to loans and advances as revealed through the observations of Thiongo (2016) who established that mortgage financing was significantly linked to loans and advances as well as Grippa and Gornicka (2016) who found that size of the bank was significantly linked to loans and advances.

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter provides comprehensive findings on descriptive statistics and inferential statistics and their interpretation. These findings have been discussed in line with the research objective which was establishing the level of asset-based financing on performance of loan portfolio amongst commercial banks in Kenya. The sections discussed under this chapter include major finding, recommendations, limitations and areas for further research.

#### **5.2 Summary of Findings**

Descriptive results established that loan portfolio significantly increased in the study period and attained a mean of KES. 47344.117. These results are consistent to Abata and Adeolu (2014) who found that loans and advances increased over the study period. The findings also pointed out that mortgage financing also increased by a margin of KES. 65554.00 in the study period. In view of this, Guerrieri and Lorenzoni (2017) who concluded that mortgage loans issues by commercial banks increased in the study period.

Customer deposits, liquidity, bank size and profitability of commercial banks increased with significant margins. These observations are in line with the findings obtained by Grzywacz and Handlowa (2016), who discovered that customer deposits, liquidity and size of the bank increased over the study period.

The increases in the study variables was largely attributed to better performances by commercial banks, this made it easier for banks to meet their financial compulsions. This also gave customers confidence and trust to continue depositing their money with the banks. This views have also been echoed by Thiongo *et al.* (2016) who found that when banks performed, they met their financial duties with ease and customers confidence increased.

Correlation results established existence of a moderate correlation between size of the bank and loans and advances ( $R=0.436$ ). These outcomes are consistent to the views of Grippa and Gornicka (2016) who established a weakly and moderate correlation among bank size and loan portfolio. There was no correlation amidst customer deposits, liquidity, ROA and mortgage outstanding ( $R=-0.017, -0.018, 0.209$  &  $0.187$ ), these findings conform to the observations by Fahlenbrach, Prilmeier and Stulz (2017) who established that liquidity, customer deposits and profitability lacked a correlation with loans and advances. However, the findings further contradict with the suggestions of Bandyopadhyay (2016) who found a correlation between mortgage financing and loan portfolio.

Regression results established that coefficient of determination was a reliable predictor and a good fit for the data, explaining 47.6% variation in loans and advances of commercial banks. It was also revealed that overall regression equation applied in the study was significant (p-value of 0.000 ( $<0.05$ )). These findings abide by the observations of Abata and Adeolu (2014) who established that the regression model adopted in the study was significant.

ROA, customer deposits and liquidity were found to be insignificant since their probability values exceeded 5% (0.515, 0.679 & 0.416, respectively). These findings contradict with the observation of Fahlenbrach *et al.* (2017) who established that customer deposits were significantly linked to loans portfolio. The findings further agree with the observations of Kiama and Thiongo (2016) who found that liquidity and profitability were insignificantly linked to loan portfolio.

On the other hand, size of the bank and mortgage financing were significantly linked to loan portfolio since their p-values were below, 5% (.003 & 0.000). These results agree with the observations of Thiongo (2016) who found that mortgage financing was significantly linked to loans and advances. Another study by Grippa and Gornicka (2016) found that bank size was significantly linked to loan portfolio.

### **5.3 Conclusion**

The study concludes that all the study variables: loan portfolio, mortgage outstanding, customer deposits, liquidity, firm size and profitability recorded an increase during the study period. This increase was contributed by better performances by commercial banks which enabled them to meet their financial obligations and issue more loans and advances. In addition, customers were more confident to deposit their money with commercial banks since they were certain on the bank's going concern.

Correlation findings revealed that size of the firm was weakly correlated to loan portfolio however, there lacked a correlation between mortgage outstanding, liquidity and profitability with loans and advances. The results of regression analysis depicted that the coefficient of determination was a good fit for the data thus a reliable predictor. Overall regression analysis was found to be significant; the predictor variables mortgage outstanding and size of the firm were statistically significant.



However, liquidity and customer deposits were negatively and insignificant linked to loan portfolio.

#### **5.4 Recommendations**

The study recommends that commercial banks should more vigilant in implementing credit policies so as to mitigate the risks from loans through asset-based financing. This will lead to a reduction in bad debts and improve performance of loan portfolio among commercial banks.

#### **5.5 Limitations of the Study**

The study utilized secondary sources of data; that consist of general purpose reports which are historical and easily to manipulate. This kind of data is not accurate and reliable and this might impact negatively on the quality and reliability of findings.

This research utilized a descriptive kind of research design with a clearly defined research question. The main weakness of this type of research design is that it cannot establish causality between variables. Even though with descriptive research design, the researcher was able to establish the nature of existing relationships among variables, the causal effects of this study were not explored.

This study spans for a period of five years; it is advisable for future researchers to do a longitudinal study that covers for a period of say, 20 years. This way, the researcher will be able to establish the nature of existing relationships between the variables accurately.

## **5.6 Suggestions for Further Research**

It is important for future researchers to consider investigating the long-term effect of asset-based financing on performance of loan portfolio among commercial banks in Kenya using form of research design. This will help to establish the long-term sustainability of asset-based financing on performance of loan portfolio and overall performance of commercial banks.

Interest rate capping has had a significant impact on commercial banks' loan portfolio because today, commercial are adopting stringent measures to ensure that borrowers abide with the credit policies. Future researchers should consider investigating the effect of interest rate capping on loan portfolio of commercial banks, the findings obtained from this study might be utilized by CBK of Kenya and other finance practitioners to establish whether interest rate capping is beneficial to commercial banks or not.

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## APPENDIX: SECONDARY DATA

<b>Loans and advances</b>	<b>Mortgage Outstanding</b>	<b>Customer Deposits</b>	<b>Liquidity</b>	<b>Firm size</b>	<b>ROA</b>
411,666	65,554.00	0.1392	0.199	5.744786	0.0494
139,406	46,652.00	0.112	0.155	5.608956	0.0568
177,224	20,681.00	0.0778	0.179	5.583006	0.0431
20,771	18,936.00	-0.0618	0.228	5.434061	0.0368
43,943	10,192.00	0.1165	0.209	5.455035	0.0334
107,038	8,847.00	0.1066	0.183	5.431496	0.0305
39,763	8,420.00	0.1176	0.185	5.264707	0.0409
7,232	6,620.48	0.2451	0.181	5.36083	0.0313
68,153	5,573.00	0.2627	0.216	4.992253	0.0649
7,741	3,810.00	0.1202	0.264	5.285145	0.0294
38,080	3,728.00	-0.0338	0.184	5.379139	0.0234
5,680	3,657.66	-0.0123	0.119	4.982868	0.0526
3,242	3,188.00	0.1435	0.208	4.753054	0.0472
33,589	2,474.00	0.1253	0.305	4.883309	0.0259
9,882	2,067.00	-0.1384	0.222	4.414723	0.0327
10,171	1,916.33	0.1706	0.162	5.041164	0.0067
7,365	1,709.00	-0.0483	0.457	4.272027	0.0219
135,443	1,619.00	0.3551	0.194	4.79328	0.0063
16,371	1,062.20	-0.0178	0.271	4.495766	0.0081
118,459	1,020.73		0.187	4.441349	0.0087
21,456	960.79	-0.112	0.255	4.19874	0.0144
6,867	847.45	0.2291	0.201	4.23955	0.0125
6,345	753.67	0.2253	0.323	4.394522	0.0082
9,929	729.78	0.1899	0.16	4.160318	0.0124
13,746	609	-0.848	0.453	4.024363	0.011
18,887	607.86	1.7284	0.251	3.979594	0.0101
10,303	304.47	-0.031	0.196	4.21272	0.0035
126,983	291.63	-0.2113	0.14	4.012626	0.0052
10,710	259	-0.3691	0.387	4.733927	0.0006
6,680	86.2	-0.4616	0.274	3.813247	0.0021

156,843	59		0.316	3.709355	-0.0081
235	54,333.00	-0.9041	0.228	3.549984	-0.0838
12,330	51,754.00	0.3759	0.079	4.069853	-0.0307
221,698	22,900.00	-0.2643	0.163	4.128916	-0.0326
46,928	14,972.00	0.5738	0.232	4.285602	-0.0328
20,144	16,161.23	0.0215	0.154	4.108937	-0.0593
10,995	8,882.00	0.1142	0.162	3.416641	-0.3215
291	7,539.00	-0.1681	0.184	4.83917	-0.0199
3,309	7,238.29	1.8094	0.213	4.727996	-0.0268
52,630	5,035.00	1.2575	0.212	4.047197	-0.1414
373,031.31	3,043.43	-0.2141	0.187	5.7031	0.0564
132,497.35	3,491.69	1.1788	0.177	5.579497	0.06
176,348.53	3,344.07	-0.2654	0.192	5.544066	0.0515
19,354.22	3,439.00	0.6341	0.205	5.398416	0.051
38,089.50	2,300.00	0.5579	0.283	5.414134	0.0402
105,082.15	990.18	1.9721	0.179	5.38761	0.0364
40,170.01	3,110.95	2.4739	0.14	5.215151	0.0527
241,394.75	2,321.00	8.3851	0.189	5.324031	0.036
68,615.72	1,885.00	3.6088	0.271	5.311531	0.0337
7,108.71	541.68	-0.4542	0.173	5.014201	0.0584
28,241.78	854.4	3.2641	0.164	5.209105	0.0366
5,361.37	49	-1.3552	0.423	4.918591	0.0467
4,014.75	957.12		0.25	4.815166	0.0357
37,480.16	678.2	0.3149	0.277	4.679564	0.0457
10,317.36	920.59	-2.1522	0.158	4.833051	0.0212
8,360.64	922.71	4.3942	0.193	4.350306	0.0355
7,026.35	631.11	-10.0408	0.163	4.433866	0.0278
118,483.10	375.96	-1.0541	0.269	4.47157	0.0223
15,022.00	357.76	-1.5872	0.165	4.84156	0.0091
112,509.00	319	-1.9556	0.372	4.231291	0.0365
27,392.64	63.87	5.4188	0.273	4.21096	0.037
8,319.31	69	-3.6074	0.176	4.097188	0.0394
6,242.85	28.18	1.7142	0.153	4.167465	0.0205

10,497.28		0.3537		4.350674	0.0099
13,418.47		6.0438	0.241	5.061128	0.0014
15,292.83		0.1134	0.331	4.019739	0.0153
9,604.09		0.2688	0.157	4.086431	0.013
104,302.16		-13.4591	0.094	3.974374	0.0111
10,082.53	126	-43.7526	0	4.21532	0.0058
		-4.1538	0.247	4.319626	0.003
141,702.28		-3.7026	0.21	3.748266	0.0089
	3.88	0.0837	0.177	3.996512	0.0036
14,487.83	47,749.00	-0.4281	0.187	4.748157	-0.0003
221,038.83	47,581.16	-0.8207	0.216	4.17499	-0.0028
53,485.10	18,183.00	4.6097	0.198	3.718834	-0.0193
16,685.77	17,290.01	0.604	0.22	4.143577	-0.0199
11,925.98	14,716.00	5.4382	0.189	4.196563	-0.0312
-	7,798.00	-0.5309	0.189	4.139942	-0.0701
3,126.70	6,578.00	3.8187	0.209	4.673242	-0.0613
56,785.56	5,200.89	4.1944	0.273	5.670005	0.0501
324,284	4,552.71	-1.7924	0.179	5.533173	0.0656
122,905	4,494.00	-26.648	0.139	5.530904	0.0414
148,846	3,446.27	0.1359	0.203	5.382293	0.0501
17,973	3,390.57	0.2559	0.242	5.369459	0.0383
32,263	2,838.98	0.2151	0.168	5.16981	0.0566
107,683	2,829.00	0.1701	0.159	5.297931	0.0356
4,271	2,757.76	0.0673	0.394	5.280915	0.0369
41,617	2,357.00	0.0776	0.198	5.195241	0.0399
212,711	2,313.00	0.2161	0.259	5.297726	0.0314
72,842	2,026.00	0.2402	0.135	4.945208	0.0633
5,582	1,622.00	0.0674	0.192	4.909503	0.0355
27,683	1,099.00	0.1412	0.261	4.81292	0.0399
5,329	833.66	0.1982	0.372	4.833644	0.0365
4,009	761.31	0.0613	0.172	4.624932	0.0349
41,075	667.75		0.328	4.392943	0.0442
10,155	554	0.1522	0.296	4.301464	0.0338



7,388	413	0.3257	0.166	4.467963	0.0186
7,339	365.07	0.0872	0.115	4.281193	0.0272
103,535	312.77	0.0703	0	4.159567	0.0353
15,538	239.61		0.255	4.009876	0.0474
111,286	191.29	0.1283	0.337	4.198932	0.0303
9,389	111.63	0.1534	0.188	4.343566	0.0161
30,902	28	0.0585	0.11	4.16462	0.0225
10,400	5.94	0.0808	0	4.022552	0.0239
6,485	4.9	-0.1569	0	4.22899	0.0105
10,767	4.01	0.2004	0.225	4.022263	0.016
12,826	41,327.00	-0.0172	0.236	4.719555	0.0018
13,124	45,278.00	0.1412	0.173	4.150327	0.0035
9,926	5,694.00	0.1089	0.211	3.754195	0.0075
104,302	13,092.64	0.0282	0.208	3.929215	0.0049
9,094	13,039.80	-0.2392	0.21	4.224844	0.0022
128,266	6,375.00	0.0834	0.21	4.164739	0.0007
13,317	4,922.00	0.2882	0.19	4.012289	-0.0174
229,394	3,268.70	-0.2759	0.148	4.176814	-0.0184
57,975	3,929.00	-0.0707	0.354	3.891035	-0.0391
15,864	1,052.00	-0.0118	0.135	4.160469	-0.0453
11,532	3,293.00	-0.0724	0.241	4.840608	-0.0207
2,790	2,899.12	0.1291	0.189	5.097934	-0.0134
54,624	3,201.80	-0.0091	0.216	5.576306	0.0593
257,399	1,621.00	0.0722	0.184	5.442662	0.0726
192,973	3,314.80	0.0139	0.127	5.347595	0.0642
181,370	1,052.00	-0.0021	0.415	5.451309	0.0443
128,204	2,311.30	0.0268	0.306	5.354191	0.0544
95,258	904	-0.115	0.338	5.137667	0.0564
128,768	1,901.00	0.0988	0.181	5.233877	0.0431
97,984	701	0.0474	0.198	5.149761	0.0447
92,667	101.43	0.167	0.258	5.136996	0.0444
91,163	885.8	0.027	0.332	5.245041	0.0257
89,797	468.45	0.105	0.151	4.89981	0.0522

68,093	574.99	0.242	0.371	5.029838	0.0308
39,681	517	-0.08	0.236	4.792006	0.0435
46,260	389	0.277	0.18	4.752809	0.0475
35,060	190.36	0.083	0.148	4.79108	0.0424
39,236	209.96	0.163	0.304	5.089428	0.019
29,002	174.34	0.34	0.419	4.739715	0.0418
24,116	46.24	0.112	0.363	4.53618	0.0374
24,541	28	0.331	0.266	4.19863	0.0461
12,438	4.7	0.103	0.108	4.518409	0.0208
14,068	5.41	0.18	0	4.084469	0.0529
13,513	6.28	0.44	0	4.236638	0.0368
11,214		0.375	0.227	4.295655	0.0311
10,979	619	0.095	0.301	3.975386	0.0563
12,851	605	0.282	0.258	4.178459	0.0313
9,990	3.4	0.165	0.238	4.163489	0.0259
6,464	35,279.00	0.201	0.18	4.331205	0.0149
11,555	34,030.00	0.368	0.255	4.229272	0.0188
10,766	10,098.96	0.366	0.198	4.217879	0.018
10,467	11,621.05	0.143	0.173	4.793874	0.0033
10,295	5,277.00	0.159	0.164	4.0103	0.0186
7,786	5,911.00	0.074	0.418	4.017117	0.0132
9,332	4,640.30	0.024	0.161	4.184067	0.0067
5,887	2,889.31	0.107	0.284	4.117868	0.0073
6,609	2,710.78	-0.075	0.227	3.895312	0.0107
5,389	2,743.00	0.292	0.235	3.773567	0.0128
5,078	1,947.39	0.068	0.17	3.544316	0.0021
3,443	3,686.00	0.01	0.132	3.947679	-0.0102
4,707	392.66	0.087	0.405	4.178315	-0.0182
3,719	5,149.60	0.035	0.325	3.677242	-0.0697
785	1,735.00	0.217	0.132	4.21982	-0.0278
55,837	1,618.00	1.485	0.145	4.662134	-0.0109
31,827	626	0.213	0.251	5.376931	0.077
4,208	117.33	0.359	0.836	5.509622	0.055

190,514	2,075.00	0.131	0.569	5.343456	0.06
126,088	1,196.68	0.011	0.144	5.315991	0.058
114,485	1,393.00	0.234	0.421	5.359596	0.047
61,319	98.02		0.249	5.2323	0.041
28,373	459	0.316	0.173	5.042639	0.055
61,883	442.4	0.218	0.158	5.057423	0.049
31,099	473	0.343	0.302	5.052759	0.046
25,782	394	0.364	0.475	4.852742	0.07
24,278	257.1	0.061	0.403	5.0965	0.036
22,912	393.48	0.101	0.307	4.716187	0.048
1,208	55.99	0.096	0.15	4.633529	0.058
27,204	91	0.077	0	4.884053	0.029
20,625	129.19	0.265	0	4.694263	0.038
18,105	144.7	0.13		4.966109	0.019
32,768	13.9	0.246		4.638499	0.04
21,766	9	0.091		4.487435	0.041
181,567	9.31	0.137		4.72167	0.02
9,116	3.4	0.105		4.134942	0.043
10,115		0.413		4.293119	0.029
11,200		-0.006		4.120541	0.042
27,908		0.047		3.907304	0.062
0		0.423		4.041748	0.043
4,479		0.235		4.205583	0.027
6,351		0.087		4.408884	0.016
3,490		0.342		4.108396	0.03
-36		0.135		4.134273	0.028
5,055		0.168		4.106497	0.025
4,266		0.405		4.192595	0.018
3,967		0.158		3.984887	0.023
3,795		0.18		4.053271	0.018
1,286		0.078		3.845532	0.025
2,832		0.119		4.192065	0.01
-613		0.076		3.904661	0.012

109		-0.066		3.845718	0.013
1,111		0.042		3.760875	0.014
1,422		-0.121		3.863858	0.01
3,057		0.153		3.466423	0.005
1,793		0.099		4.224766	0
2,781		0.043		3.569374	-0.008
5,715		0.1			-0.075
49,337		0.069			-0.033
25,327		0.085			
4,208		1.82			
		0.196			
		0.078			
		0.211			
		0.07			
		0.378			
		0.11			
		0.124			
		0.849			