

EFFECT OF BANK SPECIFIC FACTORS ON INCOME DIVERSIFICATION OF LISTED  
COMMERCIAL BANKS IN NAIROBI SECURITIES EXCHANGE.

BY

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## 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 contains no material written or published by other people except where due reference is made and author duly acknowledged.

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## ABSTRACT

Banking industry is a very critical industry in economic affairs of any given country not to mention the global economic affairs. Bank run in one country if not well controlled can quickly degenerate into a banking crisis and in the long run into a contagion either locally, regionally or even globally. Supervision and examination of banks using the recommended bank specific factors by CAMELS Model comes in handy to ensure all regulations and requirements are followed. This ensures the banks continues to offer their intermediation services as required. The rise in regulation of traditional income sources of commercial banks, industry deregulation and technology changes has allowed non-bank institutions to offer stiff competition to the banks especially in the traditional income space. This has made commercial banks to shift to non-interest incomes in order to supplement the incomes lost. This study therefore sought to understand how bank specific characteristics influence commercial banks in diversifying incomes in both interest and non-interest based sources as measured by Herfindahl Hirschmann Index (HHI). The study considered Capital Adequacy, Asset Quality, Management Efficiency, Earning Ability and Liquidity to test their effect on income diversification. The study targeted the commercial banks in Kenya but specifically focused on the listed commercial banks at the NSE. Census sampling method was employed since the listed commercial banks are few however commercial banks that did not meet the inclusion criteria were not considered in the analysis. The study process utilized the secondary published data from the CMA, CBK, NSE and Individual banks websites among other Economic reports. The data was collected using a data collection form and then transferred to Microsoft Excel for clean up before exporting it to STATA for the analysis. Panel Data analysis techniques was employed and GLS was used to fit the model since the technique is versatile in dealing with Auto correlation and Heteroscedasticity challenges. The output indicated that Capital adequacy has a strong positive correlation to income diversification while Asset Quality and Management Efficiency have a negative significance degree of association to income diversification. Earning Ability has a negative weak significance to the income diversification. Lastly, liquidity effect on income diversification was inconclusive. The output results implied that bank management, Central Bank and Treasury should develop policies and environment that allows banks to invest the excess capital for income diversification. Banks should develop policies and invest in models that favor Asset quality improvement and credit administration policies to manage asset quality. Additionally management of costs is vital in order to assure income diversification benefits hence cost management's measures and monitoring tools should be implemented. Lastly liquidity effects on income diversification was insignificant and inconclusive therefore further studies on this is recommended.

**Key Words:** Bank Specific Factors, Income Diversification, Contagion, Non-Interest income, CAMEL, Herfindahl Hirschmann Index

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## **DEDICATION**

I dedicate this work to the Almighty God. Secondly to my Spouse Janeffer and my children Robinah, Lawrence and Ephantus. Their Grace, Patience, Moral encouragements, Prayers and Understanding made the exercise bearable.

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## **ACRONYMS AND ABBREVIATIONS**

<b>ADB</b>	African Development Bank
<b>CAMEL</b>	Capital Adequacy, Asset Quality, Management Efficiency, Earning Ability and Liability
<b>CBK</b>	Central Bank of Kenya
<b>ROA</b>	Return on Assets
<b>ROE</b>	Return on Equity
<b>ROI</b>	Return on Equity
<b>GDP</b>	Gross Domestic Product
<b>HHI</b>	Herfindhal Hirschman Index
<b>NIM</b>	Net Interest Margin
<b>NPL</b>	Non-Performing Loans
<b>KBA</b>	Kenya Bankers Association
<b>CTF</b>	Counter Terrorism Financing
<b>AML</b>	Anti-Money Laundering
<b>GLS</b>	General Least Squares
<b>IV</b>	Instrumental Variable
<b>OLS</b>	Ordinary Least Square
<b>POLS</b>	Pooled Ordinary Least Square
<b>FE</b>	Fixed Effect
<b>RE</b>	Random Effect
<b>SPSS</b>	Software Program for Social Sciences
<b>STATA</b>	Statistics and Data software
<b>E-VIEWS</b>	Econometrics Views Software

## OPERATIONAL DEFINITION OF TERMS

<b>Bank Specific Factors</b>	Javid, (2016) this emphasizes on internal factors or banks characteristics determined by the management and policy decisions.
<b>Income Diversification</b>	CBK (2018) refers it as the growth in non-traditional incomes Signifying a shift to non interest incomes from interest sources.
<b>Financial crisis</b>	it refers to a situation where the value of financial institutions or assets drops rapidly (Teimet, 2011).
<b>Contagion</b>	This is a situation where financial crisis may spread from one institution to another (Teimet 2011).
<b>Mixed Research Design</b>	Simiyu et al (2017) defines it as a study that involves Collecting, analyzing and interpreting quantitative and qualitative data in a single study.
<b>Multi Collinearity</b>	Refers to the high correlation between two or more independent variables.
<b>Stationarity</b>	This is an assumption made in a data with Times Series features where the stationary process property mean, variance and autocorrelation do not change over time.

**Heteroskedasticity**

Woolridge (2015) defines it as the unequal spread or variance of errors. It can be a systematic pattern in the errors where the variances of errors is not constant.

**Endogeneity**

This is a term used to describe the presence of an endogenous explanatory variable in the multiple regression equation; i.e. a variable that is correlated with the error term either because of omitted variable, measurement error or simultaneity (Woolridge, 2015)

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the study

Commercial banks play a vital role in economic allocation of resources. This happens in all countries. They facilitate the channeling of funds from surplus sources (depositors) to deficit areas (borrowers) (Ongoro & Kusa, 2013). The banking system is very sensitive and poor handling of the banking system may lead to financial crisis and banking failure which may eventually lead to Economic failure. The system failure may not only have local effect but may lead to negative economic effects beyond the local boundaries thus leading to a financial contagion (Ongoro & Kusa, 2013). The academic interest on the commercial banks performance dates back to 1930's after the famous great depression and the interest has grown over the years. This is argued so because in all the financial crisis that have affected this world, commercial banks are involved being intermediation channels (Flamin et al, 2009).

Banks intermediation services earn them incomes from the transactions effected between the demanders and suppliers of money which comprises the traditional incomes. Teimet (2011) argued that according to the financial statements analysis, 40% of the banks net operating incomes comes from non-intermediation sources. This is a clear indication that banks incomes from intermediation services is becoming less important and they are shifting the sales mix by diversifying the incomes sources.

Performance of commercial banks is highly influenced by both internal factors (micro) and external factors (macro). The internal factors, also called bank specific factors, are influenced by the individual bank board of management decisions while the external factors also known as the macro economic factors are usually beyond the control of the board

of management hence cannot be controlled or moderated in terms of a firm or the commercial bank performance (Chinoda, 2013). Scholars have put a lot of focus on this area in very broad ways however, the majority have concentrated on the profitability outcome. Ponce (2013) argued that bank size had a significant effect on the return on assets and return on equity. However Athanslogou et al,(2005) on his study ‘effect of bank specific and industry specific macroeconomic determinants of Greek banks profitability, found out that with exception of bank size, all other internal factors tested significantly affected bank profitability and in terms of the concentration and ownership on the bank profitability, there was insignificant relationship. The corporate governance and board characteristics also influence the commercial banks performance and the asset quality. Liang et al (2013) found out that the board size had negative significance on the bank performance while the size of independent directors and the number of meetings significantly affected the performance and the assets quality.

. Scholars have also looked at the effect of the macro economic factors on the banks profitability ratios either as independent topic or with respect to micro economic factors. A study by (Joulard & Lahsen, 2018) on factors affecting bank performance an empirical evidence from Morocco found out that operating management efficiency is significant and negatively related to the banks performance. Additionally the concentration ratio or the market structure has a negative relationship with bank performance and is statistically insignificant. Joulard & Lahsen (2018) concluded that effect of macro-economic conditions on the bank performance is insignificant based on returns of Assets and return on Equity, however the inflation and GDP have positive relationship to the measure of profitability. The selection of the bank specific factors is varied and as a result comparison becomes difficult due to mixed findings on the outputs.

This is evident from the scholars and researchers who have based their research work on a variety of internally controlled factors. Additionally a lot of emphasis has been put on banks' profitability as a measure of performance. Based on Basel committee there is a standard on which internal factors performance should be scaled to avoid very many internal factors for Comparison purposes. The Basel committee was established in 1974 by the governors of the G-10 countries. The purpose of the Basel committee was to form a forum for the banks banking and supervisory authorities to cooperate in enhancing the quality and banking supervision around the world. The main purpose was to help in addressing the challenges presented by the globalization of financial and bank markets. This was driven by the reality that banking regulations remained under the national regulatory bodies and hence the need to move toward a more unified, globalized approach in regulation issues. The regulations in this industry have been adopted by policy makers largely from Basel Accords despite the fact that accords are not mandatory. The CAMELS was developed as a supervisory tool and the rating helps determine the risk level of the individual banks. From this development the model applies unified factors that are applicable to all the banks (Baral, 2005). The use of CAMEL model makes it easier to compare banks using a standard methodology which is a major shift from the studies that have considered the bank specific factors without following the CAMEL. In Africa this study area has attracted interest from various scholars just like in other parts of the globe. Chinoda (2013) did a study on determinants of commercial banks profitability in Zimbabwe and concluded that returns on assets, liquidity, size, inflation, and GDP rate positively influence the bank profitability although liquidity had a weak significance. Additionally he also found out that expenses management had a negative relationship to the returns on Assets indicating that the banks in Zimbambwe were not able to transfer all the operating expenses to the customers, while Oluoch and Lawal (2018) did a study on effect of assets quality on the operational efficiency of deposit money to banks in

Nigeria. This study found that for the banks to improve their profitability, asset quality had a significant statistical relationship to the operational efficiency. Therefore maintaining a high quality assets improved the profitability of the banks. As argued earlier, most of these studies have considered general firm characteristics and have not followed the CAMELS selection model to determine or study the bank specific characteristics and their effect on banks' incomes diversification or even performance. The non-uniformity in selecting the bank specific characteristics has led to conflicting outcomes and hence the need for further studies on this area. Sun (2018) in his paper Non interest income and performance of commercial banks in China, asserts that there is significant relationship between non-interest income and bank performance as measured by return on Equity as a measure of profitability. The results from some of the studies are conflicting and surprising too. Mndeme (2015) in his study on the effect of non-interest income on the financial performance of Tanzanian banks found that a rise in non-interest income had a negative impact on the overall performance of the bank as measured by the profitability ratio. The expectation in this case could have been that the non-interest income significantly and positively influenced the profitability and this conflicting results demand further studies based on proper selection of variables as recommended by Baral (2005) in order to verify the outputs in a different economic environment.

In Kenya this area of study has also attracted some interest among scholars, academicians and researchers. After the interest capping regulation was established in Kenya in 2016, the monetary regulatory authority released their report in 2018 July. Central Bank reported that there was rise in non-interest income and drop in Interest income. They associated this to the fact that the banks had shifted their income generation from the traditional source (interest income form Lending) to the non-interests sources as reported by (CBK, 2018). This means probably the banks used their unique characteristics and strengths to seek alternative sources of revenue. This therefore suggest that during crisis, economic

down turns and overregulation's, banks implements various models in order to diversify business activities and therefore this area is still evolving and is a paramount study area since the banking industry is very a sensitive industry, susceptible to economic shocks and prone to stringent regulations and if not properly supervised it leads to economic losses, massive loss of confidence in the industry, bank failures and receiverships. Additionally, use of banks specific factors as a strength to diversify business activities has in the past attracted support and criticisms in equal measure from scholars. This has been attributed to conflicting results on the impact of income diversification to the banks efficiency and performance. Secondly, for developing countries like Kenya most financial systems and markets heavily rely on banks. Banks have become major players in offering investments and trade alternatives like derivatives as depicted from the financial statements .From the reviewed studies it is evidently clear this area has a lot of interest and very many scholars are still reviewing it. Additionally the conflicting research results based on non-standard bank specific characteristics/factors by different researchers have opened the need for further studies. Studies on Bank specific characteristics based on CAMEL model and income diversification are relatively few in developing countries and this study area is still evolving hence the demand for further empirical investigation and study.

### **1.1.1 Bank Specific Factors**

Bank specific factors are also referred to as the internal factors. i.e. factors that are within the control or direct influence of a bank management. Different scholars define this context based on the factors that they have considered or investigated in order to determine the effect mostly on the profitability. Various scholars look at bank specific factors from different context. Bougateg (2017) define bank specific factors as the determinants related to the direct results of managerial decision of a bank and are within the control of the of the bank management. He furthers this by adding that the factors or variables are Capital Adequacy

ratio, Asset quality ratio, liquidity ratio, operating efficiency ratio, deposits ratio and bank size. This differs from other scholars who have considered other internal variables as part of the bank specific variables like Anthanasoglu et al (2005) who argued that bank performance is usually influenced by both internal specific factors and external factors. Therefore the performance will be based on the decision made by management and the overall policy decisions. In their paper, they considered bank specific factors or the internal factors like bank size, capital management efficiency and the risk management capacity.

Ongore and Kusa (2013) published a paper titled determinants of financial performance of commercial banks in Kenya also considered effect of internal and external factors on the bank profitability. In this paper they define bank specific characteristics as specific internal variables which directly affects the profitability of a specific bank. They further add that this variables are within the scope of the bank to manipulate them and differs from one bank to the other. These specific factors or variables are capital size, size of the deposit liabilities, size and composition of the credit portfolio, interest rate policy, labor productivity, state of information technology, risk level, management quality, bank size, bank ownership among others. Waemustafa (2019) did a study on regulatory changes and bank specific factors upon balance sheet activities from the banks in southern Asia, in this paper the scholar classified bank specific factors as a set of the controllable management factors which account for the interbank differences in their performances. He considered factors like bank size, loan advances, profitability, credit risk, liquidity risk, efficiency and market concentration. This means the controllable factors within a bank are wide and probably many scholars and researchers select them based on the expected output of their research as can be noted in the case of Setiadi et al (2018) who studied bank specific factors affecting the Non-performing loans in developing countries. They considered the bank variables that were

within the control of the management. These variables were credit growth, profitability, operating efficiency capitalization and income diversification.

From the reviewed scholarly work different scholars define and select bank specific variables or factors in different contexts depending on the research interest, however there is a consensus that bank specific factors are micro in nature or internal and must be in the control of specific bank board of management and their policy decisions. Secondly the factors are wide and very comprehensive in nature (Ongore & Kusa, 2013). To avoid ambiguity on the selection of the factors, CAMELS model was established. This model as argued previously proposed standard to scale factors hence making comparison and examination of banks easier based on unified bank specific factors (Baral, 2005). The specific bank factors or characteristics based on CAMELS model are Asset quality, Management efficiency, Capital adequacy, Liquidity, Earnings ability and Sensitivity and are commonly used to proxy measure the banks.

Capital adequacy refers to the capital level recommended by the regulator that allows the commercial banks to endure risks associated with the banks or during the adverse status. The risks include credit risk, market risk and operational risk among others. Capital significantly affects the ability of a bank to generate income since it acts as a buffer in supporting the commercial banks' ability to do business (CBK, 2018). Growth of the capital in banking is contributed by profits retentions and injection of additional capital. Kamande (2018) postulates that capital adequacy establishes liquidity for commercial banks since banks deposits from customers are fragile and susceptible to bank runs, therefore observing capital adequacy requirements manages the possibility of bank distress.

According to Basel III a bank should have large capital ratio in order to smoothen credit cycling and lower concerns about credit worthiness (Waemustafa et al, 2019). The argument however does agree with some scholars since holding too much capital again attracts costs.

Herring (2018) argues that undercapitalized banks will face high cost of obtaining capital while the overcapitalized banks face the opportunity cost of holding excessive amounts of capital. It therefore means it prudent for banks to hold the required capital adequacy level only otherwise if they overcapitalize then the capital should be invested in other alternative income generating sources to avoid the opportunity cost of holding idle capital. In Kenya the regulatory requirement in capital adequacy is measured in terms of the ratios between Core Capital to Total Risk Weighted Assets, Core Capital to Total Deposits and Total Capital to Total Deposits. Currently the regulatory capital adequacy level is 14.5%, 8% and 12 % respectively (CBK, 2013).

Asset Quality is a critical variable that affect the ability of a commercial banks to generate income. The Asset quality explains the likelihood of loans defaults combined to the measure of its marketability. The assets in banks constitutes the fixed assets, credit portfolio, government securities among others. The most commonly used measure of asset quality is the level of NPLs because the credit portfolio constitutes the largest portion of the bank's assets. Additionally quality of the loan depends primarily on the portfolio of loans and the internal credit administration mechanisms (Anthansalogou, 2008). CBK (2018) attributed the growth in NPLs in Kenya between 2017 and 2018 to subdued business activities, delayed payments from both private and public entities and the low uptake of housing and commercial units. High levels of poor quality exposes the banks to inability to generate more income from interest based streams and as such, banks may be forced to diversify or invest in non interest based streams of incomes. Proper administration of asset quality removes bank uncertainty over the capital position and the inability of generating more incomes. Additionally, loans loss provisions are minimized hence the resources can be utilized to facilitate income diversification strategies (Nguyen, 2012).

The management efficiency refers to the capacity and ability of the bank board of directors and management to identify, measure and control risks attributed to the bank operations and hence guarantee compliance to the laws and regulations governing the banks. To measure or determine the management efficiency in a bank is usually very subjective and different methodologies are applied depending on the subject of interest. The most popular methodology however is testing for operational efficiency to measure the management efficiency. This regards the management of expenses and improving the income generation. Ongore and Kusa (2013) argued that management efficiency significantly determines the ability or the level of operating incomes in a bank and therefore the higher the operating efficiency ratio the higher the management efficiency.

Earnings ability is the potential of a commercial bank to generate incomes in order to facilitate expansion and increase its capital. According to the Basel III accord, earning ability is essential in order to help the bank to absorb losses and boost the banks' capital. The evaluation of a bank earning ability is based on various measures like ROA, ROE and NIM. Traditionally banks have been relying on incomes from interest based channels however over the time income diversification has been noted on published reports of various listed commercial banks. This implies income diversification to non-interest based streams in order to improve the commercial banks earnings. This alternatives incomes are fees charged, commissions from investments banking and insurance underwriting services among others. The earning ability is analyzed periodically in order to keep track of the industry (Tamale, 2017).

Liquidity generally refers the ability of commercial banks to fund or finance assets holdings increase and meet the depositor's obligation as and when they fall due without incurring unacceptable losses (CBK, 2018). The attempt to balance the liquidity obligations in a bank is a tough affair since the liquidity is meant to finance acquisition of assets, meet

immediate withdrawals, do short term lending and facilitate opening up of new channels of diversification. This may lead to liquidity risks and hence the regulator identified various ratios to be used to test and curb the possibility of liquidity risk. The ratios, total liquid assets to total assets , total loans to total deposits and total liquid assets to total liabilities are the most popularly used. It is prudent that banks measure liquidity regularly and create ways of raising or funding liquidity requirements especially during distress situations, this demands that banks apply liquidity stress test in adhoc basis in order to identify potential liquidity strains that may limit the banks' ability to generate diversified incomes and probably subject the bank to losses. Such liquidity test help develop contingency plans to handle liquidity crises. The CBK, (2013) prudential guidelines has set a statutory minimum of 20% of all the deposit liabilities, matured and short term liabilities to be held in liquid assets.

The selection of bank specific characteristics/ factors was based on CAMEL model which is widely and commonly used to assess the banks and hence individual's banks differences was easy to measure and compare using the published data.

### **1.1.2 Income Diversification.**

This study focused on income diversification. This context is very important in the banking sector and very crucial in the current financial environment. Banking across the globe is highly regulated in order to avoid financial turmoil, however the rapid changing financial environment, the regulatory pressure, volatility of interest based incomes, competition and changes in Technology have made banks to diversify their incomes to non-traditional sources and therefore increase the share of the Non interest incomes. Additionally many banks have put efforts to leverage on the technology to offer alternative products i.e. product diversification in order to bring extra incomes from non interest sources. Income diversification from interest based to non interest based incomes is considered important in building incomes streams portfolios. The buildup of income portfolios and its benefits has

attracted criticisms from scholars like Kiweu (2012) who argued that there was positive correlation between net interest income and the non-interest income and this meant the non-interest income could not be used to stabilize the operating income volatility and hence benefits of income diversification by then would not offset the risk generated by non interest incomes. The output and opinion postulated by Kiweu was disputed by scholars who used the strength of the Modern Portfolio Theory and Post Modern Portfolio Theory. Berger *et al* (2010) found no significant impact on risk adjusted performance and incomes stability. This is because interest based incomes are un-correlated to interest based incomes and as such it reduces the overall incomes volatility. In the long run the bank profitability improves and shareholders value grow.

Ebrahim and Hassan (2008) as quoted by Mulwa, Tarus and Kosgei (2013) defined income diversification as the expansion into new incomes earning financial services other than the traditional intermediation services. While other like Calmes and Theoret (2013) argue that incomes diversification is the shift from reliance on interest income sources associated with traditional intermediation activities to innovative income earnings activities. Stiroh (2004) studied US banks and he found out that diversification of banking revenue from internal based activities to non interest based activities was important. This is because it leads to reduced revenue volatility and total leverage.

Various studies have been done to try and understand the effects of income diversification on firm performance. This studies and their outputs differs and contradict thus creating need for further research in this area. Amidi and Wofe (2013) from an evidence of 978 banks concluded that competition and diversification of revenue increases bank stability and reduces or decreases the insolvency risk in banking on the other hand Olarewaju (2018) argues that income diversification can help minimize the empire building by managers and hence work hard toward wealth creation for the shareholders.

Away *et al.*(2011) found out that income diversification has positive effect on the Kenyan banks financial performance .However this differs from Lepetit et al.(2007) who concluded that banks diversifying into non-interest income activities presented a higher risk and higher insolvency risk compared to banks that only focused on traditional lending. Levin and Lavine (2007) did a study on the effects of diversification on the market value of banks and they concluded that market value of diversified banks were lower than those of banks that specialized in income generation, on a different study by (Huizinga & Kunt ,2009) they found out that universal banking in USA was beneficial in terms of diversifying risks and increasing returns however strategies that were predominantly advocated for generation of non-interest income only were highly discouraged as they were considered risky . This results were consistent to the (Lepetit et al, 2007). Additionally some studies argue that extensive incomes diversification in banking require great care since it reduces financial performance by increasing the risk of default instead of improving profits (Delpachitra & Lester, 2013). This agree with the conclusion that incomes diversification should be approached with a lot of expertise since it brings with it new risks that may require specialized managerial expertise and lack of such skill may severely affect the banks operational incomes performance (Sahoo & Mishra, 2013).

Scholars have made different and conflicting conclusions regarding income diversification in banking based on benefits and limitations. Incomes diversification bring with it profitability and possibility of volatility in incomes. The conflicting results makes it a challenge to make formidable conclusion on this topic, thus creating more desire for further study in this area. The circumstances are equally changing in the banking sector and new evidences to support previous outputs or to challenge the outputs is still coming up as the circumstances evolve. The benefits of Incomes diversification and challenges associated with it need further review especially in the developing countries. Few studies exist on this topic

especially in the developing countries and therefore it's prudent to test and compare result with other studies done across the globe. The level of regulations pertaining business banking has been growing in the current century and Kenya is not an exception, the landmark regulations being on interest capping, deregulation of interest capping and the CTF and AML regulations among others. Under such an environment banks income diversification is affected and hence need to determine how it is affected and suggest ways to recover the lost income space.

Line et al, (2012) argued that loans/assets ratio is applied as a measure of diversity since traditionally loans were the major assets of a bank hence interpreting the ratio of loans to assets helps conclude or interpret the orientation towards main stream banking or away from non-interest income. A lower ratio of loans to assets in the long run indicates a shift towards non-interest income. Other scholars like Kiweu (2012) in Kenya and Stiroh (2004) in USA considered the HHI technique to study the income diversification. According to this index, HHI rises if it becomes more concentrated and focused on one source of income and less diversified. Well diversified banks are reflected by small HH Index, the smaller the index then the higher the level of diversification (Kiweu, 2012).

### **1:1:3 Overview of Listed Commercial banks**

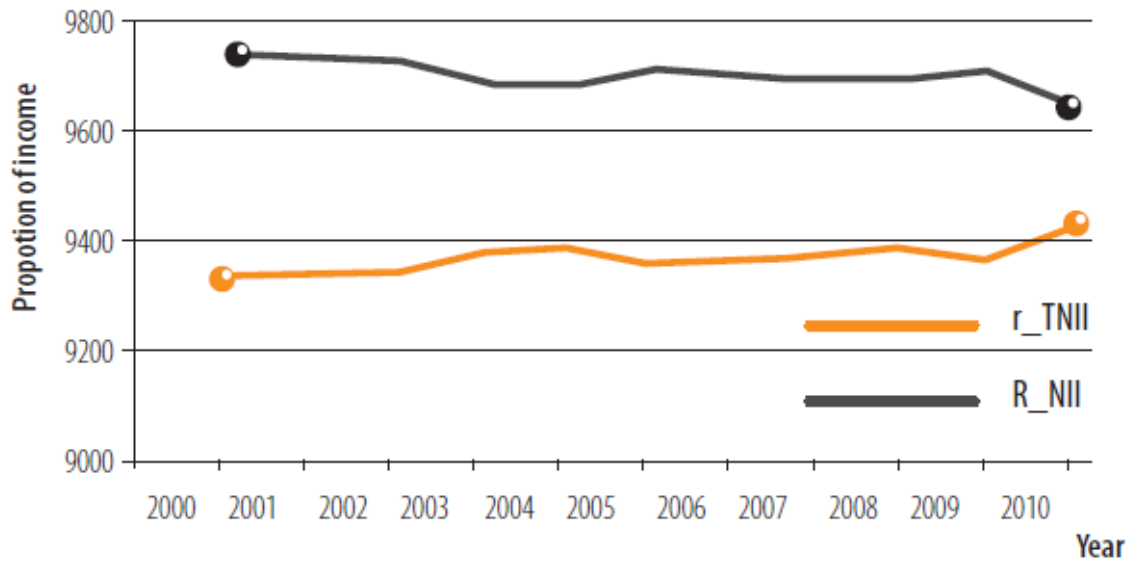
Banking industry in Kenya is regulated by the central bank of Kenya, The companies Act and Banking Act. Additionally the prudential guidelines issued from time to time not forgetting the treasury guidelines and the finance Act. The Industry plays a vital role in the implementation of the monetary policy, intermediation and humanitarian roles among others as argued by Hugo, 2013. In Kenya the Licensed Commercial banks are 42 as at Dec 2020. (Central Bank of Kenya, 2021). The CBK has licensed Mortgage Finance Institution and Seven Non-Operating Bank Holding companies. The listing in the stock exchange is done at the Nairobi Securities Exchange after a company has met the minimum requirements as

provided by the Capital Markets Authority. The Listed commercial banks out of the 42 licensed are Absa, CFC-Stanbic, HF, NCBA, Cooperative Bank, I&M Holding, KCB ltd , Standard chartered , BK group, Diamond trust Bank, National Bank and Equity holdings (NSE, 2020).

## **1.2 Statement of the Problem**

The banking sector has attracted a lot of accusations from Kenyans due to its predatory nature or behavior with the sole aim of growing profits due to unregulated markets interest rates. This has led to numerous industry regulations, competition and banks that cannot cope with prevailing environment have been struggling to stay afloat as the traditional income space shrinks. As can be seen in the trend analysis graph below income diversification has been on the rise since year 2000 to 2010 implying a move towards Non Funded Incomes. From the trend prior to 2010 there was a steady growth in fee based income or the NFIs. Small banks which are on the danger of being wiped out would also benefit from income diversification (Fadhila, 2014). This is due to the fact that smaller organization and more so banks would be more efficient to employ diversification despite the structural and industrial challenges. Many banks have been on the fore front to employ use of technology in order to reduce the costs and offer other products and services. The aim has been to reduce operational cost and also offer other non-interest income generating products and services all in the aim of diversifying income sources.

## A trend of NII and TNII propotions between 2000 and 2010



Source: KBA (2012)

According to CBK, (2018) the non-interest income accounted for 33.42 % of all the income generated that year while the interest income from advances and interest from government securities' accounted for 66.58 %. While in 2019 the non-interest income accounted for 27.96% even though this looks like regression the absolute value grew while interest income in government securities increased by 2.43 %. The interest income from advances reduced in absolute value from 266,368 M to 265,020 M. It was also observed by CBK that after the introduction of the interest capping regulations in 2016 which were later repealed in 2018, after the inception of the interest capping banks shifted their investments to government securities probably due to the low risk associated with such securities'. It was also noted that during that period the share of banks non interest incomes had increased an indication that the banks had shifted their revenues sources in favor of Non-interest income. The Share of non-interest income had been at 12.4% as at September 2016 but increased to 15.2% as at June 2017 and this shift was across all categories of the commercial banks.

Al Muhusel *et al.*(2018) did a study in Azerbaijan on bank specific factors and macroeconomic determinants of bank profitability. In this study they considered bank specific variables like Capital size, liquidity risk, loans and deposits. The findings of this study revealed that all the factors were statistically significant to the profitability as was measured by ROA. This was slightly different from expectation because more loans in most cases means higher NPL hence less interest incomes thus affecting profitability negatively but insignificantly.

The study area has also attracted a lot of interest in African countries. Rani & Zergaw (2017) did a study on bank specific, industry specific and macroeconomic determinants of bank profitability in Ethiopia. In this study they tested bank specific variables like capital adequacy, Management efficiency, earning, and liquidity ratio. While Mndame (2015) did a study on impact of non interest incomes on banking performance in Tanzania. He tested how non interest activities affected the bank performance. His performance was measured in terms of risk.

Onuonga (2014) in her study on analysis of profitability of Kenya Top six Commercial banks: internal factor analysis. She considered variables in the name of Bank size, capital strength, ownership, operations expenses, loans, deposits, assets diversification on profitability as measured by ROA.

From the studies reviewed above the Scholars have a mixture of micro (bank Specific) and macro variables on the performance of banks measured by profitability ratios or risk which does not fully address the effect of the bank specific factors on income diversification in Kenyan banking industry. The observation by CBK has not been addressed by any of the reviewed studies i.e. how would bank specific factors affect incomes diversification during financial crisis and during stringent regulations of interest based incomes. Most of the scholars did not consider the CAMEL and Basel II Accords models to

select the bank specific variables thus making it difficult to compare various studies comprehensively and uniformly. Additionally, different studies considered varied research designs and possibly the cause of some inconsistencies and conflicting results hence the desire for further study in this area. It is also noted most studies on the effect and benefits of income diversification have concentrated in developed countries and hence minimal literature exist on this area from the developing and emerging markets. Lastly the study area is evolving rapidly due to stringent regulations on interest generating income space, emerging issues in modern banking, competition, technological changes and empire building strategies. In view of the above the study sought to evaluate the effect of bank specific factors on the incomes diversification of listed commercial banks in the NSE.

### **1.3 Research Objectives**

#### **General Objective**

To find out the effect of bank specific factors on income diversification in listed Commercial banks.

#### **Specific Research Objectives**

The research study was guided by the following specific objectives

- i. To find out the effect of Capital Adequacy on income diversification in listed commercial banks.
- ii. To determine the effect of Asset Quality on income diversification in listed commercial banks.
- iii. To appraise the effect of Management Efficiency on income diversification in listed commercial banks.
- iv. To evaluate the effect of Earnings ability on income diversification in listed commercial banks.
- v. To assess the effect of Liquidity on income diversification in listed commercial banks.

## **1.4 Research Hypothesis**

The study was guided by the following null hypothesis,

*Ho<sub>1</sub>: Capital Adequacy has no effect on incomes diversification in listed Commercial banks in Kenya.*

*Ho<sub>2</sub>: Asset Quality has no effect on the income diversification in listed commercial banks in Kenya.*

*Ho<sub>3</sub>: Management efficiency has no effect on income diversification in listed Commercial banks in Kenya.*

*Ho<sub>4</sub>: Earning ability in banking has no effect on income diversification in listed Commercial banks in Kenya.*

*Ho<sub>5</sub>: Liquidity has no effect on the income diversification listed commercial banks in Kenya.*

## **1.5 Justification of the Study**

The study examined the relationship between the specific factors and the income diversification of listed commercial banks. The gist was on understanding how the specific factors which are unique for each bank affected income diversification. The findings of this study can be used by various stakeholders as discussed below.

### **1.5.1 The Regulator and the Policy Makers**

In the current economic status a lot of regulation have been put in place in the banking industry for the purpose of protecting the industry. This study will help the regulator and policy makers in the industry to take more concern and precautionary attitude as they formulate guidelines, policies and regulations for economic purposes. The framework on the regulations should be considerate of the need by banks to use their strength in internal factors in order to diversify their income sources but within a controlled well supervised framework.

### **1.5.2 Financial advisors and Consultants**

The findings of this study is of immense benefit to the financial advisors and Consultants. Having this knowledge can be used as an enabler in financial advisory to the banks, observing market behavior and hence conduct adhoc analysis to determine the changes in the industry for advisory purposes and hence improvement in industry performance.

### **1.5.3 Scholars**

This study area is very important to the scholars in Finance, Commerce, Economics and investment or any other business related disciplines. The area is still evolving especially in the developing world and the students who wish to further their research work in this area may use it for reference and knowledge.

### **1.5.4 Banks and Investments Firms**

The results of this study can be used by commercial banks and investments firms to understand about their strengths and weaknesses based on CAMEL. This will make it easier for them work on the weaknesses and take advantage of their strengths to diversify their incomes further for stability and growth. The investments firm especially those in investment banking will find this study important for their business growth and advisory in future.

## **1.6 The Scope of the Study**

The study involved research on bank specific factors as independent variables, namely the Capital Adequacy, Asset Quality, Management Efficiency, Earnings Ability and Liquidity of the bank and tested on dependent variable Income Diversification. The study covered the Listed Commercial banks in the NSE and data collected and analyzed was for a period of 10 years i.e. from year 2010 -2019. The Geographic Scope was Kenya.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter has five parts which are, Theoretical review, Empirical review, Conceptual framework and the Operationalization of variables. The theoretical review has in detail reviewed the theories that guided this study and portrays how each theory relates to the objectives under study. The empirical reviews looks at the findings of other scholarly works and studies , noting their authors , year of study, the methodology used in the study, the data used to arrive at the various conclusions. Lastly the Chapter covers the operationalization of variables which defines and gives detailed explanations on the measurements of the variables used in the study.

#### 2.2 Theoretical Review

This section of the study covers the various theories that were used to guide the study. The theories link the bank specific factors to the incomes diversification in the banking industry.

##### *2.2.1 The Capital Structure Concept. (The Tradeoff Approach Theory)*

The capital structure concept was formulated by Modigliani and Miller (1958). The theory postulated that the value of the firm is irrelevant to the capital structure of the firm or the company i.e. whether the firm is highly levered or low levered the firm value has no bearing to the leverage. The firm value therefore depends on the operating profits of the bank. The capital structure therefore determine the capital adequacy depending on how the firm finances its assets i.e. either via debts, equity or a combination of the two.

In the trade off theory MM approach assumes a world of no taxes, however the world is controlled by taxes. The theory recognize that tax benefits are accrued on interest

payments. The interest paid on borrowed funds is tax deductible but dividends do not carry the same privileges on equity. This implies that the actual cost of debt is less than the nominal cost of debt due to tax benefits. This approach advocates that a company or a firm can capitalize on its capital requirements with debt as long as the cost of distress exceeds the value of tax benefits. In modern times the approach with corporate taxes does acknowledge tax savings and infer that a change in debt equity ratio has an effect on the weighted average Cost of Capital.

This theory helps understand the capital adequacy in banking and how the capital mixture can be raised at the most cost effective ways and any excess capital can help the bank to diversify their incomes with more benefits compared to the cost of capital whether debt or Equity. The tradeoff structure theory will also make it easier to understand liquidity health in banking and how the liquidity influence the income diversification and earnings ability. This is based on the fact that banks use their liquidity to meet unforeseen runs and whether it will with stand such challenges and still be able to diversify their incomes from traditional sources to Non-Interest incomes by leveraging on the technology in use, available staff and generate more incomes using the available liquidity at minimal costs. Additionally this theory explains about management efficiency and operational efficiency. This is because by incorporating debt in the capital structure the theory puts pressure on management to prudently manage the resources in order to achieve managerial and operational efficiency.

### ***2.2.2 Anticipated Income Theory***

This theory was advanced by H V Prochanow (1944). The theory was advanced on the basis of advancing the term loans after the failure of The Real Bills Doctrine which addressed the advances of the short term and self-liquidating loans. The theory posits that banks plans loan liquidation or maturity from the anticipated incomes of the borrower. The theory was meant for loans liquidating after one year but not more than five years. The strength of this theory is

that the loans will be hypothecated from machinery, stock and immovable properties. According to this theory, the bank puts restrictions on the financial activities of the borrower when granting the loan. During the appraisal of the loan and loan disbursement, the bank takes into consideration the security of the loan and the anticipated cash flows incomes of the borrower. The theory is framed on the assumption that, the loan repayments or the installments will be paid in the future by the borrower not as a lump sum upon maturity but on regular intervals until maturity and hence it keeps providing liquidity to the banks.

This theory is preferred in this study since it addresses liquidity of the banks, safety, and operational income generation. This theory additionally addresses the quality and safety of the loaned out funds which is part of the bank's Assets. The bank does so by securing the loan and performing appraisal in advance to determine the creditworthiness of the customer to avoid over financing. From the theory, excess reserves held by the bank can be granted by the bank as loans in order to increase revenue or used to finance incomes generation from non-interest based streams. The theory however does not address the need to meet the emergency needs of the lender bank since it only addresses the regular income streams from the loans installments.

### ***2.2.3 The Innovation Theory of Profits***

This theory was coined by Joseph Schumpeter (1934). He originally emphasized on entrepreneurial profits and he believed that an entrepreneur could only earn profits by employing use of successful innovations. According to this theory the author considered innovations as any new policy that would help minimize the overall cost of production or increase demand of his products. The theory considers innovation in two categories: The first category deals with the production techniques or the introduction of new machinery or innovative methods that changes the whole industry while the second category deals with innovations which increase the demand of a product such as the introduction of a new

commodity or new quality products or product designs thus increasing the demand of the products or services .The profits earned are short-term as the competitors imitate the products or innovations and in the long run the profits start to disappear .

According to Schumpeter the firm may continue enjoying the super profits for a long time if it's possible to patent the innovation or if the organization has very unique characteristics that cannot be transferred within the industry. The theory however does not consider the element of uncertainty as a factor in profits generation considering it is not only the innovations that contribute to earnings in a firm. Opponents of this theory argue if an entrepreneur is able to predict the future with precision he will still be able to generate profits. Additionally profits may be generated due to the existence of monopoly markets. This theory was preferred because it helps in understanding the managerial efficiency of the board of directors and senior management of the bank. The efficiency in this case is based on innovation in new services and policies that help improve earnings generations and hence improve the operational efficiency of the bank. The theory also helps understand earnings ability of the banks in order to improve their profitability. This helps remove uncertainties in the industry and close supervision of banks by the monetary regulator especially the ones with deficiency in earnings ability.

#### ***2.2.4 The Shift Ability Theory of Liquidity***

This theory was founded by H G Moulton (1925). He asserted that commercial banks maintain a substantial amount of assets that can be shifted on to other banks for cash without the material loss in case of the necessity and hence there will be no need to rely on maturities. According to this theory a perfectly shift able asset must be immediately transferrable without capital loss when the need for liquidity arises. This need is particularly applicable to short term market investments like the treasury bill and bill of exchange which can be immediately disposed when the banks require or are in need of liquidity. However during the

financial crises when all the banks require liquidity the banks should hold or possess such assets that can be shifted to the central bank which is the lender of the last resort. This cushions the commercial banks and protects the financial system during the acute depressions where such assets cannot be disposed to individuals. In modern times this theory is highly applicable because banks do accept sound assets which can be shifted to the central bank and other banks like the shares and debentures of large blue chip companies which are accepted in the name of liquid assets in the same category of the Treasury bill and bill of exchange. Acceptance of these securities encourages lending by the banks, assures of assets quality and protects the loaned out funds even if it does not assure of liquidity in the banking system since it will be dependent on the economic performance. This theory helps in review of assets quality within the banking industry and how such assets quality can be used to diversify income generation not forgetting creation of necessary liquidity to generate more revenues.

### ***2.2.5 Modern Portfolio Theory***

The theory was developed by Harry Markowitz (1952). This theory gained its popularity past 1950's and today the theory is an anchor theory in Finance and Investment. It is based on the idea of risk averse investors. The theory argues that the investors can construct a portfolio to optimize or maximize expected returns based on a given level of market risk. This is based on the fact and believe that risk is an inherent part of the higher reward. The theory operates on the assumption that risk averse investors, given two portfolio that offer the same expected returns, the investor prefers the less risky one. Therefore an investor only accept an increased risk if he is compensated by higher expected returns and on the flipside an investor who expects higher levels of returns must be willing to accept higher levels of risk. In the long run there is a tradeoff between risk and expected return however investors will trade off differently depending on the risk aversion. To facilitate risk reduction the theory argued that an investor can diversify on the portfolio either locally or internationally by investing in perfectly uncorrelated combination of instruments.

For the purpose of this study the MPT has been preferred since based on portfolio balance approach banks holds different classes of assets which is a function of the policy decision

made the by banks as guided by the CAMEL approach. Additionally the ability to diversify sources of income is anchored on the policy decisions and the level of risk as recommended by the regulator and the individual banks risk appetite. Lastly the use of efficient frontier curve in MPT helps a bank to select portfolios (Source of Income) based on the level of risk. The selection of revenues sources portfolios is guided by the CAMEL decisions policy. MPT theory is highly applicable in analyzing banking sector being a highly regulated industry in matters risk and Traditional Incomes Sources.

## **2.3 Empirical Review**

### **2.3.1 Capital Adequacy and Income Diversification**

Capital adequacy in the banking industry is core. This is because it gives the stability and anchors the bank operations. Various Scholars have reviewed literature on capital adequacy either as a single independent variable or in combination with others on the influence it has on bank performance either in terms of NPL, Profitability or other metrics of bank performance. Ramadhani and Bintoro (2017) conducted a study on effect of capital adequacy, credit risk, operation costs, income diversification, firm size and ownership structure on the profitability of bank. This study involved the listed commercial banks of Indonesia Stock Exchange (ISE) from year 2011 to 2015. They relied on published data and tested a multiple linear regression model using SPSS V12 software. They found out that Capital adequacy, credit risk and liquidity had no significant effect on the profitability, however the income diversification and ownership structure had significant positive effect on profitability. Lastly, operational costs and firm size caused significant adverse effects on the profitability.

Other scholars have looked at capital adequacy as an independent variable and its effects on financial performance as measured by ROA. In this regard Simiyu et al (2017) did a study on the impact of capital adequacy on the financial performance of listed companies at the NSE. In this study they considered capital structure, Asset size, cahsflows and portfolio risks as the parameters of capital adequacy. They tested the effect of this parameters on the

profitability of the firms as measured by ROI. The data tested for this study covered a time period of 10 years and employed a mixed research design, where they considered both quantitative and qualitative designs and employed descriptive and inferential statistics using standard statistical techniques. Pearson product moment of correlation and regression analysis was employed and analyzed using SPSS V24. They tested for ANOVA in order to establish if there was a significant difference between the observed and the expected values with Pearson chi square. From the results of the model and after testing all the capital adequacy parameters, they found that capital adequacy had a positive relationship with the financial performance of the companies listed firms in the NSE.

Nzioki (2011) did a study on the impact of capital adequacy on the financial performance of commercial banks quoted at the NSE. In this study he tested the variables Asset Quality, Capital Adequacy ratio, Asset base and Bank size as the components of Capital Adequacy. He used the random sampling techniques to select the sample banks and considered a sample of five banks to test for his variables using secondary data collected from the CMA and published information by the five banks quoted at the NSE. He used cross-sectional analysis and tested for Pearson product moment of correlation before performing the regression analysis in order to test for validity before the regression analysis. From the analysis he found that Asset base, bank size, Asset quality and capital adequacy ratio had a positive relationship to the financial performance of the selected banks and hence significant across the five banks. The conclusion on capital adequacy by Nzioki (2011) agrees with Sikolia and Miroga (2018) who concluded that capital adequacy positively and significantly influenced the financial performance of commercial banks in Kenya.

### ***2.3.2 Asset Quality and Income Diversification***

The relationship between the Asset quality and income diversification has attracted attention from various scholars and the outcome differs depending on the methodology employed and the dependent variable. Rani and Zergaw (2017) using panel data analysis tested the relationship between asset quality and the interest margin in the Ethiopian Commercial banks. The data used covered the period between 2005 and 2015. From this study they found *ceteris Paribas*, 100% increase in the asset quality of the bank increased interest margin however Asset quality was statistically insignificant. The arguments in this case was that as the assets quality increased, the total loan book increased which in turn increased the interest income of the banks that was generated from the total loans. This meant or implied that during this period the banks in Ethiopia relied more on traditional sources of income (Interest) from the lending activities and hence less income from Non- interest incomes. Other scholars argue that shifting from Interest based incomes to Non Interest based incomes helps in risk minimization, thus improved risk trade off. In this regard financial soundness of banks depends on the asset quality of its assets. Poor Asset Quality may possibly affect the possibility or the ability of the bank to shift its incomes to Non-interest income sources however it's also possible that such banks try to diversify more in order to offset the loan losses.

Nguyen (2012) in his study on the relationship between market power and revenue diversification, he tested bank's loan portfolio quality against the revenue diversification. He found a nonlinear relationship between the bank loans portfolio quality and the non-interest income. He concluded that market power had a nonlinear relationship to the revenue diversification. This outcome differs from Tennant and Lutherland (2014) as quoted by Kamande (2017) who found no relationship between the asset quality and none interest income diversification.

Sakwa et al (2019) in their study on Asset Quality as a determinant of commercial banks performance in Kenya, the author's tested loan loss ratio and total investment to the Asset ratio. The study covered year 2012-2017 and used a census of all the listed commercial banks as at 2017. They employed times series data analysis and found out that there was positive correlation between the asset quality indicator and profitability. Ongore and Kusa(2013) did a study on determinants of financial performance of Commercial banks in Kenya. The study employed the Bank Specific variables and macroeconomic variables. Namely they tested Capital Adequacy, Asset quality, Management Efficiency, Liquidity management, GDP and Inflation Rate. They considered the moderating variable foreign /domestic bank. The Dependent variable was Bank performance as measured by ROA, ROE and Net interest margin. They Considered 37 commercial banks which were in operation and in this case they considered 13 foreign bank and 24 local Banks. They used secondary data as collected from CBK, IMF and World Bank Database. The data was collected was for a period of 10 years from 2001 to 2010. Panel data analysis was used and excel and E-views (Econometric Views) software were used. Multiple linear regression and T statistic modelling were used to determine the relationship between the explanatory variables affecting the bank performance. The moderating variable was evaluated using a dummy variable. From the analysis the results indicated an erratic trend in performance of the banks during that period. Additionally correlation coefficients indicated, Capital ratio, management efficiency, liquidity had positive correlation to the NIM even though weak with capital having the highest positive correlation to the NIM. However Asset quality, GDP, and Inflation had a negative correlation to the NIM with GDP having the highest negative correlation and this is because the NIM growth does not depend on the GDP growth as argued by Flamini et al, (2009) while Asset Quality had the least negative Correlation to the NIM. It also noted the Asset Quality coefficient to all the three parameter used in this study to measure performance

namely ROA, ROE and NIM all are negative and this means that high NPLs leads to poor bank performance, however this output results contradicts the output result of Sikolia and Miroga (2018) who concluded that asset quality was positively but insignificantly correlated to the financial performance.

### ***2.3.3 Management Efficiency and Income Diversification***

Management efficiency is a vital component in the success of any bank. The measure of this variable is very complex in nature. This is because the decisions made by the Directors and management of the banks may in some cases be difficult to quantify in terms of figures however other decisions can be quantified and measured depending on the bank performance. The Directors and management are in charge of the Vision and Mission of the bank and any decision made must reflect the direction and the trajectory path of the bank. The measure of this parameter has no universal metric but will depend on what the analyst wishes to achieve in the course of the study however it can be based on Return on Assets, Return on Equity, Ability to diversify or any form of growth in the bank however most scholars argue that operational efficiency is a paramount measure of Management efficiency at any time. The costs must be balanced not to outweigh the incomes especially in the current economies where income is shrinking day in day out. Mixed studies on this parameter look at it differently but for the purpose of this study the author will focus on operational efficiency and how it influences the diversification of incomes sources. The operational efficiency test will be highly preferable because as suggested by Sangmi and Nazir (2010) the higher the operating profits to income the higher the efficiency in terms of operations and income generation.

The conglomeration hypothesis posits that firms like banks take advantage of their internal characteristics e.g. bank size in order to diversify their business activities and hence

reduce their operational costs by diversifying sources of income Berger et al, (2000). However the strategic focus hypothesis discourages against firms venturing into business activities beyond their core or critical business. This therefore means that any firm that concentrate on their core competencies achieve their efficiency. This hypothesis has however been disputed by recent studies especially those dealing in banking where its argued that such concentration has been associated with high levels of risk and hence the need to diversify the incomes in order to minimize the bank risk( Onyango ,2018).

A study on bank efficiency and incomes diversification of the Vietnamese banks tested the effect of technical efficiency index on the income diversification. The study involved 34 commercial banks in Vietnam and covered the period 2007 to 2015. The author used Tobit regression model in his analysis and employed Stata software. The output results of the model revealed that operational efficiency of Vietnamese banks had a positive effect on the income diversification. This indicates that operational efficiency has a direct effect on the income diversification (Sang, 2017).The results however differs from the Berger et al (2005) on the bank efficiency effect.

Olerewaju et al (2017) conducted a study on operational diversification and financial efficiency of Sub-Saharan Africa Commercial banks. They observed 250 commercial banks for the period between 2005 -2015. In this study they employed the panel data analysis and tested the variables Asset, liability, Deposits and incomes with control variables bank size, liquidity, loan loss ratio, and cost to income ratio and lagged returns on average assets. This study employed cost to income ratio to test for operational efficiency. From the model they found out that operational diversification of activities is the SSA commercial banks had a direct and significant effect on the financial efficiency. This results agree with Sang (2017) results on the Vietnamese banks.

Lastly this variable was also tested by Ongore and Kusa (2013) in their study on determinants of financial performance of Commercial banks in Kenya. The study employed the Bank Specific variables and macroeconomic variables. Namely they tested Capital Adequacy, Asset quality, Management Efficiency, Liquidity management, GDP and Inflation Rate. They considered the moderating variable foreign /domestic bank. The dependent variable was Bank performance as measured by ROA, ROE and Net interest margin. They Considered 37 banks which were in operation and in this case they considered 13 foreign bank and 24 local Banks. They used secondary data as collected from CBK, IMF and World Bank Database. The data was collected covered a period of 10 years from 2001 to 2010. Panel data analysis was used and excel and E-views (Econometric Views) software were used. Multiple linear regression and T statistic modelling were used to determine the relationship between the explanatory variables affecting the bank performance. The moderating variable was evaluated using a dummy variable. From the trend analysis the results indicated an erratic trend in performance across all the banks during that period. The correlation coefficients for management efficiency was positively related to all the three parameters used to test the financial performance i.e. the ROA, ROE and NIM but was strongly related to the ROE. The authors concluded that the bank specific variables significantly affected the financial performance of commercial banks during the period of study. This outcome agrees with Sikolia and Miroga (2018) who found that Management Quality contributed to high efficiency in KCB and therefore Management quality was strongly and positively correlated to the financial Performance.

#### ***2.3.4 Earnings Ability and Income Diversification.***

Earnings ability represent the capacity of bank to realize profits that enables the organization to fund expansion, in order to remain competitive and grow the shareholder wealth. The earnings growth ability help the bank to absorb losses and make provisions for potential

losses like the unpaid loans. The earnings ability of a firm can be measured using the different accounting ratios in the name of ROA, ROE and even NIM.

Aziza and Sarkani (2014) reviewed the financial performance of Mellat Bank in Iran. They reviewed the bank based on CAMEL parameters and tested the trend analysis of the variables. From the results they found an ascending trend during the period under investigation. The scholars tested the variables using two linear and multiple regression analysis based on OLS. The regression analysis findings indicated that there was positive significant relationship between the earnings and the financial performance. In Ethiopia Rani and Zergaw (2017) did a study and considered bank specific factors, industry specific factors and macroeconomic factors on determination of bank profitability. The study took the CAMEL approach for the bank specific factors considered in the model. They considered the panel data regression approach and considered secondary data from 2005-2015. Panel data was considered in order to get the full effects that cannot be pointed out purely on cross-sectional analysis or times series alone. The results indicated that earnings ability as was measured by net interest to total assets was negatively related to the bank performance measured by ROE. This results differed from (Aziza & Sarkani 2014).

In Kenya this area has generated interest and various scholars have considered the earning ability in their studies on bank performance. Okoth and Gemenchu (2010) did a study on factors that determine the financial performance of commercial banks. The study covered the period 2001 to 2010 and relied on secondary data. They utilized linear multiple regression method and the GLS for panel data analysis. The variables tested under independent factors were capital adequacy, Asset quality, management efficiency, earning ability and the inflation rate. They tested the variables against financial performance as measured using return on Investments and net interest margin. The results from the analysis revealed all the bank specific factors were significant to the financial performance. Therefore the earnings ability

had a significant effect on ROI. A similar study by Kamande (2018) to establish trends in earnings ability of commercial banks in Kenya and their effect on financial performance as measured by ROA . Using a similar approach to Okoth and Gemenchu (2010) his findings revealed almost the same outcome from the regression model. He found that there was significant decrease in earning ability during the five year study period. The Pearson product moment correlation results indicated a weak positive correlation or association between earnings ability and the ROA.

Nazmoon and Jahangir, (2019) conducted a study on assessment of bank specific factors on operational efficiency. In the study they considered the variables banks size, capital adequacy, credit risk, liquidity, profitability and asset quality against the dependent variable operational efficiency. The study employed exploratory approach followed by the panel research design for the Bangladesh banks and the data covered six years from 2011 to 2016. The analysis was based on secondary data derived from the published banks reports. The outputs results indicated that profitability was positively related to the operational efficiency. This meant banks were focused on generating more profits and minimizing the expenses and other cost therefore banks were advised to invest in resources that would boost their operational efficiency.

A study focusing on the developing countries employed mixed panel of sixty five countries. The study focused on data collected between 1998 - 2007. The variables considered in the study were bank size and income structure on the earning volatility, the output revealed that bank size is an important determinant of earnings volatility especially in the emerging markets in the developing countries. The study did not find any effect on income structure to the earning volatility i.e. the study found no evidence that banks with more reliance on interest income had the lowest earnings volatilities however the study found that banks relying on non interest based incomes experienced higher volatility (Shehzad,2008).

The interest on the listed commercial banks in Kenya has attracted review locally. Scholars have studied on the firm performance and tested the effect of earning ability on the financial performance in recent times. A study on effect of internal factors on the financial performance considered capital adequacy, assets quality, management efficiency, earning ability, and liquidity and their effect on the financial performance the listed banks as measured by ROA. The study considered the published data for the period 2008 -2016. The researcher adopted longitudinal research design and analyzed the data using panel techniques. The study revealed that earning were generally stable during the period. Additionally the study revealed that earnings had a weak positive significance to the Return on Assets (Mananda, 2017).

### ***2.3.5 Liquidity and Income Diversification***

Bank liquidity generally look at the ability of the bank to meet the depositor's obligations as and when they fall due. Liquidity is determined using various ratios like deposit to total assets ratio and the ratio of total loans to total deposits held by the bank. Various scholars posits that holding less liquid assets by a bank is risky since the bank may not be able to service daily operations and this may spark a bank run.

Studies on the effect of liquidity in banking sector have attracted a lot of attention across the globe and diverse conclusion have come up. Weeresainghe and Raviwa,(2013) did a study on the effect of bank specific factors on the profitability of commercial banks in Sri-lanka. The study utilized data from the year 2001 - 2011. They considered various banks specific variables including liquidity risk, bank size, and capital adequacy, operating cost and credit risk. The moderating variables were GDP growth rate and interest rate. They employed panel data analysis to analyze the multiple regression and determine the relationship between the independent variables and the dependent variables. The dependent variable was measured

by ROE and ROA. They revealed that liquidity had an inverse relationship to the bank profitability. This results agreed with Ongore and Kusa (2013) who reported insignificant relationship between the liquidity and the profitability of the banks

The area has also attracted interest in Ghana. Hadad (2013) did a study on factors that affected financial performance in Ghana Naara rural banks. The author study period was 11 years from 2000 – 2010 and entirely depended on secondary data for the multiple regression analysis. The variables tested were credit portfolio, liquidity, NPL and Total assets. The results revealed that liquidity had positive significant relationship to the financial performance of Naara banks in Ghana. This results however differs from Lartey et al (2013), in Ghana as quoted by (Nyamasege et al, 2014). The study sought to establish the relationship between the liquidity and profitability of banks listed in the GSE. The study utilized data from seven of the listed commercial banks in GSE. The study employed purposive sampling technique to generate the sample from the 9 listed commercial banks in GSE by then. The study employed the panel data analysis and the results revealed that during the period under investigation both liquidity and profitability portrayed a decreasing trend throughout the period and the correlation between the liquidity and the profitability was a weak positive relationship.

In the east African region this study has equally attracted attention in Kenya. This is depicted by studies by the likes of Kamande (2017), Nyamasege et al (2014) Okusa and Ongore,(2013) and Sikolia and Miroga (2018). Nyamasege et al, (2014) did a study titled Assessing the effect of liquidity on profitability of commercial banks in Kenya. The study entailed a census of 43 commercial banks as at 2013. The data analyzed was for the period between 2009 -2013 and relied on secondary data alone. They employed descriptive and inferential statistics. The independent variable was liquidity while the dependent variable was profitability. In order to run the multiple regression analysis the author's considered other

factors that influence profitability namely bank size, deposit liability and banking risk. The results of the model revealed that the model explained 95.8%. I.e. the variation in profitability across the banking sector would be explained by the variables captured in the model while 4.2% variations in profitability is explained by factors not captured by the model. The liquidity was revealed to have a strong positive correlation to the profitability as measured by ROA. This results agrees with Hadad (2013) in Ghana but contradicts Okusa and Ongore, (2013).

Kamande (2017) conducted a thesis study on the effect of bank specific factors on the financial performance of the commercial banks in Kenya. The study was guided by CAMEL factors as the independent variables while the dependent variable was measured by ROA. He sampled all the listed commercial banks in the NSE and the study covered the data for the period between 2011 -2015. He employed the multiple linear regression analysis to test the relationship between the variables. He used SPSS V20 software to do the analysis. From The Model results the, the model could explain the variation in profit at 77.4% while the uncaptured variables would explain about 22.6% and hence the model was reliable. The liquidity as one of the variables tested in the model revealed a decreasing trend in the period under study however it had a weak positive correlation to the ROA. This outcome contradict to some extent with the outcome of (Nyamasege et al, 2014).

Sikolia and Miroga, (2018) did a study to investigate effect of bank specific guidelines on the financial performance of commercial banks in Kenya. The study considered loan management policies, liquidity management, capital adequacy, Asset quality and management quality and tested the variables against financial performance. They study was done at KCB Nairobi County branches and data was collected for the period between 2010 - 2017. The authors considered primary data mainly collected by use of structured questionnaire for their analysis and adopted the descriptive research design. They collected

data mainly from top management employees in the branches. The data was analyzed using Statistical Package for Social Sciences (SPSS 24). The results revealed that Loan Management policies, Management quality, Asset quality, capital adequacy and Liquidity management have positive significance to the financial performance as measured by ROE and ROA, even though all the variables had a positive significance to the financial performance the liquidity Management had weak positive correlation to the financial performance and the results agrees with (Kamande,2017).

#### **2.4 Summary of Reviewed Literature and Research Gap**

From the reviewed literature, diverse studies have been done across the globe regarding bank specific factors and their effect on banks performance. The studies have attracted different methodologies, Scope, time period and research design. Different authors have employed diverse data analysis techniques as has been noted ranging from cross sectional studies like in the case Aziza and Sarkani 2014, Sikolia and Miroga 2018 ,who reviewed Mellant and KCB banks in Iran and Kenya respectively. Additionally these studies employed the use of OLS regression model .Others have employed Times series in the analysis, though this has not been commonly preferred in the reviewed papers and only one author who used time series. The panel data analysis has come out strongly as the most preferred in most of the papers both locally and across the globe. Ongore and Kusa 2013, Onuonga 2014 used panel data analysis for their study while Sang 2017 preferred the Tobit model of panel data in his study of the Vietnamese banks among others.

Most scholars have been noted to prefer the use of the secondary data for listed commercial banks whether locally, regionally or in other parts of the world and this probably because its readily available from the regulators and also because it's a requirement in many countries for listed companies to disclose their financials by publishing to the public. The scholars have used different software's to analyze their data raging from SPSS , Econometric

views, Excel and STATA, however it has been noted most of the local studies used the SPSS but different versions and a handful used the Econometric views but studies done outside the region majority employed STATA and Econometric views. The results from most of the studies have given mixed results whether local or even the global studies. Lastly the studies have also employed mixed variables which in most cases has been guided by the fact that most of scholars tested the variables against the firm performance as measured by different profitability ratios. The use of mixed variables to measure profitability may have been influenced by the fact that profitability is influenced by various factors. This variables may be internal, macro-economic or even legal factors among others. Due to the mixed findings from the reviewed literature, it can be concluded that the study area is still evolving and developing locally, regionally and across the other parts of the globe. Additionally as has been argued by Fadhila, Indonesian banks in 2007 -2009 experienced poor performance before and during the financial crisis and as a result they had to implement various models in order to grow the non-interest income. During the crisis the NII was noted to have increased significantly. This was a sign that the banks had already started to diversify their income sources during the crisis. The reviewed literature did not address how the bank specific factors contribute to income diversification which is very paramount in the growth of profitability during crisis as argued by (Fadhillah, 2014).

The selection of bank specific variables differs from one author to the other and as can be noted in the case of Unuonga (2014) she classified them as Bank size, capital strength, ownership, operations expenses, loans, deposits, assets diversification while Sikolia and Miroga (2018) considered specific variables as loan management policies, liquidity management, capital adequacy, Asset quality and management quality. Ongore and Kusa (2013) considered Capital Adequacy, Asset quality, Management Efficiency, Liquidity management as the bank specific variables. From this then its clear most of the Scholars were

not guided by the CAMEL model which is used by the regulator(s) for banks examination around the globe even though banks have other specific characteristics that differs from one bank to the other. The CAMEL model bring uniformity across the industry examination. The use of a uniform model makes it easy to compare the performance across the banks.

The Studies using cross sectional analysis and relying on primary data have generated conflicting results compared to those employing use of panel data analysis. This is evidenced in the case of Aziza and Sarkani (2014) and Sikolia and Miroga (2018) where the output results agreed on the effect of liquidity as significant to the financial performance while studies by Ongore and Kusa, (2013) gave insignificant results even though he used panel data analysis. This conflicting results therefore call for further studies on this area.

The literature review based on the studies under consideration and with respect to CAMEL model very few studies comprehensively considered all the five parameters as a composite on their effect to the financial performance or income diversification. The few are Kamande (2017), Mananda (2017) and Rani and Zergaw (2017). However, their results also generated mixed findings. The effect of earning ability variable has not been tested comprehensively by majority of the scholars and its effects on the incomes diversification and therefore this demands for further studies in this particular area.

According to the CBK supervision report of 2018 the non-interest income accounted for 33.42 % of all the income generated that year while the interest income from advances and interest from government securities' accounted for 66.58 %. While in 2019 the non-interest income accounted for 27.96% even though this looks like regression the absolute value grew while interest income in government securities increased by 2.43 % . The interest income from advances reduced in absolute value from 266,368 M to 265,020 M. Additionally, after the introduction of the interest capping regulations in 2016 which were later repealed in 2018 , CBK (2018) report on the impact of interest rate capping on the

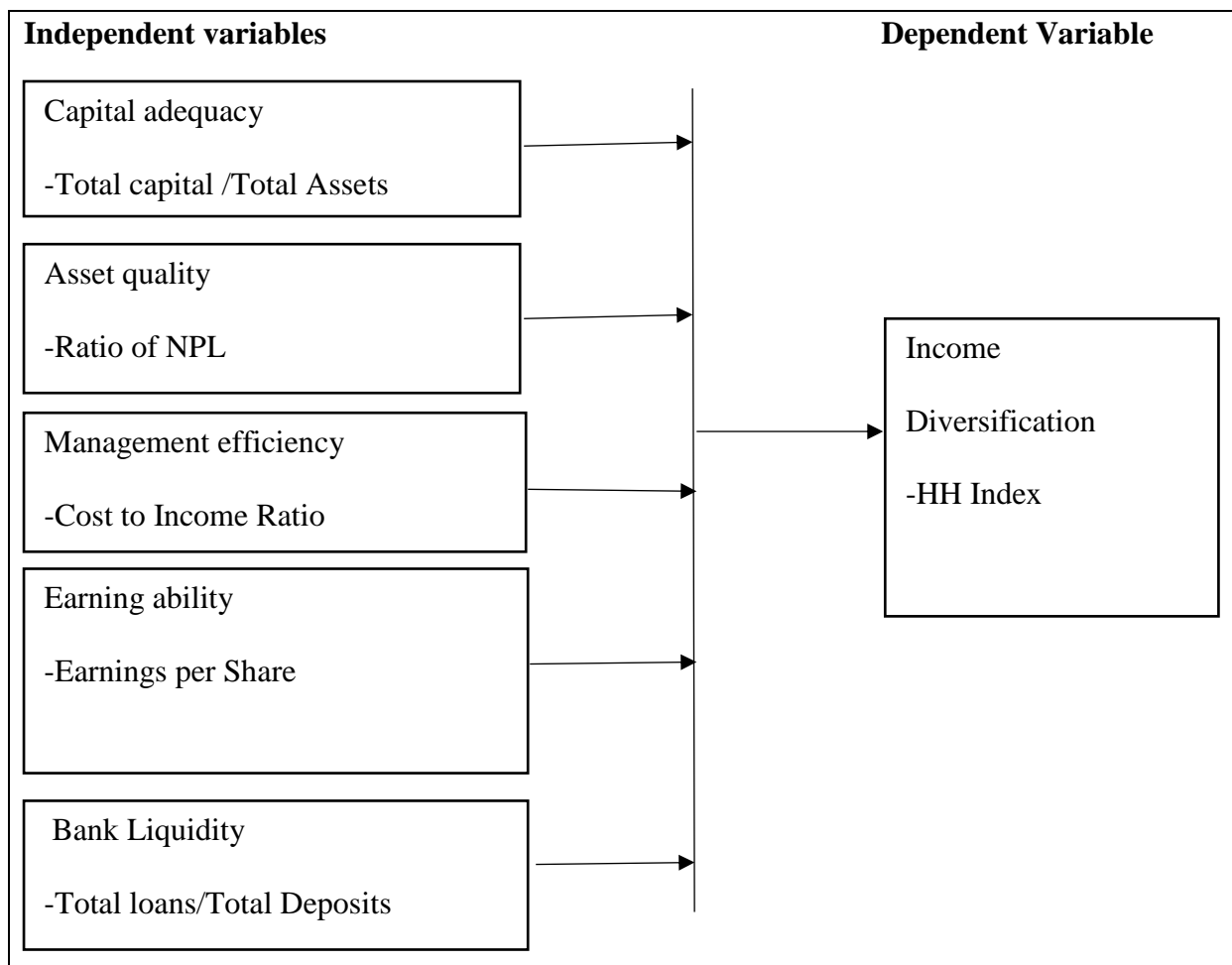
Kenyan Economy, the regulator observed that after the inception of the interest capping banks shifted their investments to government securities probably due to the low risk associated with such securities' however it was also noted that during that period the share of banks non interest incomes had increased an indication that the banks had shifted their revenues sources in favor of Non-interest income . The Share of non-interest income had been at 12.4% as at September 2016 but increased to 15.2% as at June 2017 and this shift was across all categories of the commercial banks.

The above observations by CBK were not addressed by any of the reviewed studies i.e. how would bank specific factors affect incomes diversification for profitability purposes, however it agrees with Elsas et al (2010) and Curie et al (2015)who argued that diversification in incomes would improve profitability and value of banks. Secondly, diversification could be implemented by banks facing stiff competition, strict regulations or in amid of crisis situation. The non-interest income would be diversified to Commissions, fees, provision from derivatives transactions among others. This revelation is enough proof that this area has not been exhausted and further studies are needed. Lastly there is need to further study on the effect of bank specific characteristics and how they contribute to income diversification since this area is evolving as the banking environment changes.

## 2.4 The Conceptual Framework:

This study conceptualized the relationship between banks specific factors indicators and the income diversification.

**FIGURE 1**  
**Conceptual Framework**



Source: Author (2021)

## 2.5 Operationalization of variables

This section of the study covered the various dimensions of measure, categories of variables, how they were measured and described in the analysis section. The table below summarizes the operationalization of variables:

### Operationalization Table

Category	Variable	Measure	Notation	Scale	Analysis
Dependent	Income Diversification	Herfindahl Hirschmann Index	HHI	Ratio	Descriptive
Independent	Capital Adequacy	Total Capital to Total Assets	CAR	Ratio	Descriptive
Independent	Asset Quality	NPL to Total Loans	NPL	Ratio	Descriptive
Independent	Management Efficiency	Cost to Income	ME	Ratio	Descriptive
Independent	Earnings Ability	Earnings Per Share	ROE	Ratio	Descriptive
Independent	Liquidity	Total loans/ Deposits	LIQ	Ratio	Descriptive

**Table 1: Operationalization Table**

The HH Index was adapted from Stiroh & Rumble (2006), Kiweu (2012) and Hassan (2017) computed as follows,

$$HHI = 1 - \left\{ \left( \frac{NII}{TI} \right)^2 + \left( \frac{NoNII}{TI} \right)^2 \right\}$$

Where, HHI is the income diversification range. (0 - 1)

NII represent Net Interest Income.

NoNII represents Non Interest Income.

TI represents Total Income

## **CHAPTER THREE**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the methodology used to collect data for this study, the research design, the sampling technique, instrumentation, and the data analysis.

#### **3.2 Research Design**

Millicent et al (2003) postulates that research design is like a glue that hold the research together. A design is used to structure the research, to show all the major parts of the research and the samples or groups used to address and connect to the objectives.

The study adopted the descriptive research design and was restricted to the Secondary data review only hence use of the longitudinal research. This design was preferred because it supports a fact finding mission and hence helps discover answers to the questions in the mind of the researcher. Additionally the design helped determine the current practices and status or features of the issue under study. Lastly this design accommodated use of historical data and therefore allowed not just mere description of current status but accommodated discussion on the relationship that events or variables have upon one another. Therefore the design facilitated description of independent variables relationship to the dependent variable under study.

#### **3.3 Target Population**

Sekran (2010) defined target population as the entire group of people or units of interest the researcher wishes to study or consider. Kothari (2004) on the other hand defined target population as a specific well defined set of people, services and elements, group of things or households that are being investigated or whose information is desired. For this study the population comprised all the thirteen commercial banks listed in the NSE. The Listed

commercial were preferred since they represented all the tiers in the industry, additionally the population was sufficient to compile data for micro panel analysis.

### **3.4 Sample size and Sampling**

A sample refers to a select number of individual, elements or sub unit representing the larger group from where the sample is selected (Chandran, 2004). In this study the census was adopted since the population under study was small hence for better analysis it was scientifically fair to consider the whole population. The sampling frame for this study covered the entire banking sector in the NSE. A total of 13 banks were considered and the study covered the period between years 2010-2019. A total of 10 years. This period was put in consideration since the Economy had just witnessed recovery from the Global Financial crises of 2008, where the Economy had grown at 1.7%, 2.7% and 5.4% in 2008, 2009 and 2010 respectively. Additionally the year 2011 marked the most turbulent year in the period with significant decline in all the economic indicators with inflation rising to a peak of 18.9% and the CBR rate rising to 18% which heavily affected interest rates on loans and deposits. The Central Bank implemented various laws and regulation that affected operations especially credit during the period. This are Regulatory requirements on Capitalization and liquidity 2010, Consumer prudential guidelines in 2013, The Interest Capping law which was enacted in 2016 and later repealed in 2018. The economic turbulence and the various regulations affected the banks that were in operation and listed between 2010 and 2019 and hence the desire for this study was to establish the effect of bank specific characteristics on income diversification .To ensure data balance in the panel only the banks listed before 2010 were considered and all others were dropped from the final analysis and reporting (Appendix 2 and Appendix 3).

### **3.5 Instrumentation**

This refers to the tool used to collect data. The study used data collection form to record the data extracted from the published information. The data was extracted from the annual banking supervisory report of CBK, CMA and the annual audited financial reports of the listed commercial banks in Kenya for the years under review.

### **3.6 Data Collection**

The study used secondary data published by the listed commercial banks in order to perform the analysis. The data was collected from the CBK website, individual bank website and CMA reports published from time to time. The primary financial reports was the audited and published reports as shared with the Capital Markets Authority and also the CBK as the regulators in the industry. The extracted data was recorded on the data collection sheets and attached as an appendix.

### **3.7 Data Analysis**

The secondary data collected was systematically organized in order to perform the final analysis. The data was checked for consistency and coded. All this was done using the Basic Microsoft excel. The data was then transferred to STATA for further statistical analysis. The study employed Panel Data analysis. To ensure that panel were balanced, case wise deletion of missing data and banks not within the inclusion criteria was employed and hence analyzed only the pure data. Case wise deletion was preferred since it makes the data a complete set by removing incomplete data and hence analyze the complete set of data. This method however is associated with reduction of observations.

The following mathematical model was used for the micro panel analysis purpose,

Equation 1: Panel Regression Mathematical Model

$$Y = B_0 + B_1X_{1it} + B_2X_{2it} + B_3X_{3it} + B_4X_{4it} + B_5X_{5it} + \omega_{it}$$

Where,

$Y$  (Dependent Variable) =represents income diversification as measured ratio of Non-interests income to the total revenue.

$\beta_0$ = represents the constant

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$  = this represents the beta coefficients of  $Y$

$W_{it}$ = Error Term.

Where,  $W_{it} = U_{it} + E_{it}$

$U_{it}$  is error between entities

$E_{it}$  is the error within entity

Independent variables

$X_1$ = Capital adequacy

$X_2$ = Assets quality variable

$X_3$ =Management Efficiency

$X_4$ =Earning ability Factor

$X_5$ =Liquidity Factor

$it_1 \dots it_5$  represent the variation by individual banks over time

### **3.7.1 Description of Panel Data Analysis and Model Specification**

Panel Data refers to the data collected over several cross sectional units which are observed over time. The panel data was preferred because it is more efficient with random sampling and the ease of identification reduces collinearity among the explanatory variables. The method also allow proper aggregation since the aggregation experience time variation. Additionally panels allow for control of omitted variables and accounts for heterogeneity of variables. Lastly a panel model of econometric increases efficiency of the estimators as argued by (Onuonga, 2014).The study was analyzed in descriptive statistics, correlation

analysis, and multiple regression analysis. The descriptive statistics were used to make the summary of the outcomes while the correlation analysis was used to test for the level of significance between the independent variables to the dependent variables.

In model specification, there is always a dilemma on which model to select as the most appropriate i.e. either to use POLS or PANEL Data models (RE or FE). The Pooled OLS is one where the individuals are simply pooled together with no provision for individual or time difference. This technique is only applied if the assumption that the unobservable individual cross section effects are not different is not violated. If the assumption is not violated then the Pooled OLS can be applied since it's simple and efficient. However this is not always the case because specific firm's characteristics vary across the units and with time making the technique unrealistic. As result the Random Effects model and the Fixed Effects model are preferred however you can only use one model at a time and this raises the dilemma. RE Model or FE Model? When and why?

***Dilemma 1. Choosing between Random Effects and Fixed Effects models:***

To solve this dilemma Hausman (1978) provided a statistical procedure and test for selecting the above. The Null hypothesis is that the preferred model is RE and the alternative hypothesis is that the model is FE. The test checks whether there are correlation between the unique errors and the regressors in the model. The null hypothesis being that there is no correlation between the two. From the STATA if the outcome of P value is less than 0.05 then reject the null hypothesis and if P value >0.05 then accept the null hypothesis.

***Dilemma 2: Choosing between RE and POLS model:***

In order to solve this dilemma the B-P LM test (Breusch Pagan LM test) is used. In this test the null hypothesis is that variance across the entities is Zero. That is no significant differences across the units or no panel effects. If the P Value is above 0 .05 then RE is not appropriate and Vice Versa is true.

**Fixed Effect Model:** Where the FE has been preferred it is important to check for time related fixed effects. Where the time related fixed effects have been observed then it's paramount that we include the dummy years as dummy variables in the model. This will leads to use of LSDV in order to test for one way or two way error components modes. The pool ability test will be performed using what is commonly referred to as Wald test.

### **3.7.2 Exploratory Factor Analysis;**

This involves use of the visual plots for the dependent variable only. The exploratory Factor analysis involves within the firm and between the firms analysis as discussed above. The exploratory analysis for within the firm help determine time related fixed effects. Then an exploratory factor analysis was tested between the firms which helped to determine if the intercepts was the same for firms or it varied over the firms. This was to help suggest whether it was appropriate to use FE or RE before diagnostic testing or before using the Hausmann test.

### **3.7.3 Diagnostic Testing:**

**Testing for Multi Collinearity;** this involved drawing a correlation matrix and checking for existence of high correlation between any pair of independent variables. There should be no two variables with high correlation. The test was also done by computing Variation inflation Factors. Where there are two variables that are correlated one of the variables needs to be dropped from the regression analysis though this might require the revision of the original model. For the VIF the study adopted the Gujarati, (2007) rejection threshold of 0.8. i.e a VIF of 0.8 and above indicates Multicollinearity while a VIF of Less than 0.8 indicates no multicollinearity between the variables.

**Testing for Stationarity of the Model:** The Stationarity of a panel data indicates that the process property mean, variance and autocorrelation structure do not change over the time.

For this purpose it means a flat looking series without trend, constant variance over the time and no periodic fluctuations (seasonality). The Stationarity is often determined from a run sequence plot. For the purpose of this study unit root testing was done using the Levin –lin Chu unit root test and tested the Null hypothesis at 5% significance level.

***Testing for Serial correlation:*** Serial correlation is commonly found in time series regression and not common in micro-panels and cross-sectional data. The serial correlation is caused by seasonal effects and non Stationarity of the data inputs. Where there is a problem of endogeneity (violation of Zero mean condition) between the dependent and independent variable then an IV regression should be run. The serial correlation problem can also be corrected using the Prais-Winstein procedure in the Stata.

***Testing for Heteroscedasticity:*** This test is for Homoskedasticity. The test uses the modified Wald test if the Fixed Effects is preferred chosen but in case the Random effects model is preferred the LR test should be conducted. The study considered a 5% level of significance to test for the null hypothesis however, the study used GLS technique in order to account for heteroscedasticity and autocorrelation thus avoiding a lot of revisions of the model and improving on the reliability of the estimators.

***Checking for the normality of Residuals:*** The purpose of performing this check is for hypothesis testing and assuring that the P-values for the F-test and t-test are valid. This test only require that that residuals be identically and independently distributed. The test requires regression analysis and then create residuals. To check for normality of residuals the study used PP plots, QQ plots, Kurtosis and Skewness and Shapiro Wilk Test.

## CHAPTER FOUR

### DATA ANALYSIS, FINDINGS AND DISCUSSION

#### 4.1 Introduction

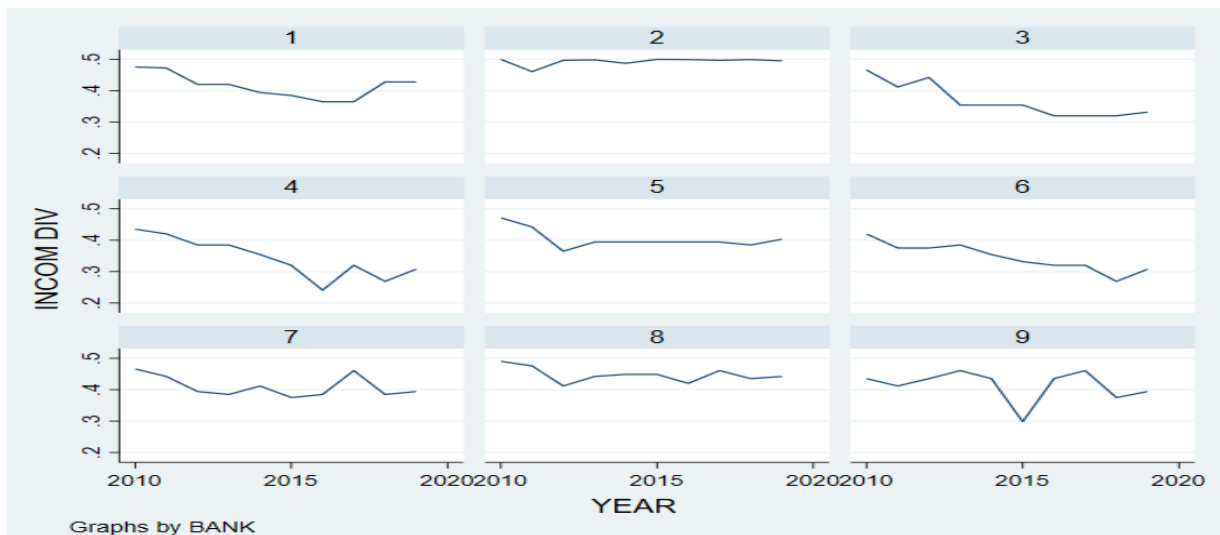
This chapter comprises of the data findings, analysis and presentation of out puts. The results are presented in tables, figures and diagrams. The analysis was done in a manner to reflect the themes of objectives under study and the proposed methodology of Micro Panel Data Analysis.

#### 4.2 Exploratory Factor Data Analysis

This involved checking whether there are differences within the firms and between firms.

##### Within the firms;

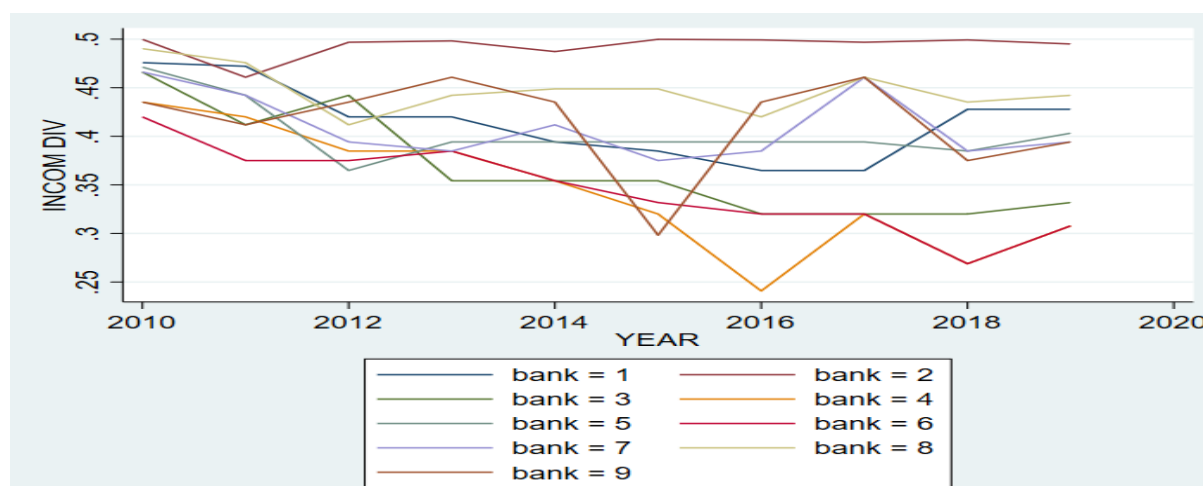
From the results below (trend plots) the trend output does not show similarity and as such time related effect's need to be accounted. Income Diversification is highly volatile as can be seen from the trends below and most of the banks diversification has been on a downward trend signifying banks are concentrating their resources more on the interest income sources.



**Table 2: Income Diversification Trend Plots**

## Between Firms

This was done by use of overlain plots also called spaghetti plots. The results indicates that firms had different intercept suggesting possibility of time related effects.



**Table 3: Spaghetti Plots for Income Diversification**

### 4.3 Descriptive Statistics

#### 4.3.1 Description of the dependent variable Income Diversification

The table below shows the income diversification across the banks for the period 2010 to 2019 as measured by Herfindal Hirschman Index (HHI).

Variable	Mean	Std. Dev.	Min	Max	Observations
incomdiv overall	.4045189	.0604504	.2408	.4998	N = 90
between		.0480936	.34364	.49328	n = 9
within		.0396883	.2885589	.5032589	T = 10

**Table 4: Income Diversification across Banks**

From the table average income diversification in all the banks is about 40.5% with a Volatility of about 6.04% Overall / across the listed banks. The minimum average diversification was about 24.08% and Maximum of about 49.88% overall. The variation in income diversification between and within the firms was 4.8% and 4% respectively and therefore variation was higher between the firms.

### 4.3.2 Description of Independent Variables

The table below shows the descriptive statistics of the bank specific factors that influence the income diversification of listed commercial banks in the Nairobi Securities Exchange.

Variable		Mean	Std. Dev.	Min	Max	Observations
car	overall	.1572222	.0213598	.11	.2	N = 90
	between		.0139443	.131	.179	n = 9
	within		.0167768	.1122222	.1882222	T = 10
npl	overall	.0956	.1094128	.01	.54	N = 90
	between		.0740003	.029	.278	n = 9
	within		.0839576	-.1424	.4026	T = 10
me	overall	.5801111	.1401564	.36	1.03	N = 90
	between		.1331582	.441	.855	n = 9
	within		.0608747	.4481111	.7681111	T = 10
earngamy	overall	8.022111	8.819014	-7.25	33.21	N = 90
	between		8.783102	.494	23.965	n = 9
	within		2.903979	-1.181889	17.26711	T = 10
liq	overall	.7987778	.2108241	.07	1.41	N = 90
	between		.2022862	.512	1.275	n = 9
	within		.0875503	.3567778	.9377778	T = 10

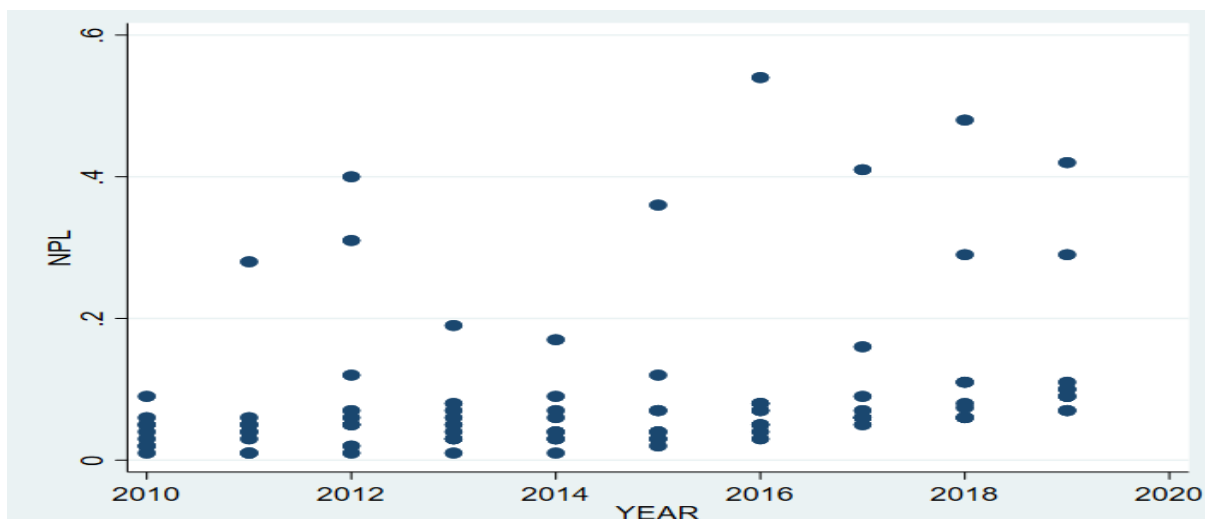
**Table 5: Descriptive Statistics for Independent Variables**

#### Capital Adequacy

From the above table Capital Adequacy has a mean of 15.72% with a Minimum of 11% and a maximum of 20%. This indicates that during the period under study the banks operated above the minimum required capital ratio of 14.5% as required by the regulator implying they held excess capital. The variation between and within the banks was 1.3% and 1.7% respectively indicating that mean variation was higher within the banks i.e. the Volatility of capital adequacy was high within the banks and lower between the banks.

## The Asset Quality

The Asset Quality which was measured by the ratio of Non-Performing Loans( at gross or before impairment) against the Total Loan Portfolio had an average of about 9.6% with a minimum of 1% and a maximum of 54% indicating a high volatility of 10.94% of the assets. This indicates a cause for worry about the growing NPL's in the selected banks as can be depicted in the graph below. This indicates high exposure to credit risk impacting income negatively. Additionally the volatility of non-performing loans was higher within the banks at 8.3% and 7.4% between the banks. This implied it was riskier or highly possible to incur NPLs within the banks compared to between the banks.



**Figure 1 : Asset Quality Graph**

## Management Efficiency

Management Efficiency as measured by Cost to income Ratio indicates that the efficiency of the listed banks was about 58. % with the most efficient bank achieving 36.0% and the least efficient bank during the period under consideration achieving 103%. This indicates that on average the commercial banks were spending about Kes 58 for Kes 100 generated and hence need for innovation to improve on costs management or invest in less costly income sources. The average standard deviation for the banks was 0.14. This implied that concentration

towards the mean for the Management efficiency was about 14% and hence the ME values were close to the mean of the data set implying low dispersion. The variation between and within the banks was 13.3% and 6.08% respectively indicating variation in Management Efficiency was least within the banks. This meant that the data on management efficiency was highly dispersed between the banks and low dispersed within the banks hence higher volatility or risk between the banks.

### **Earning ability**

Earning ability of the banks was measured by the EPS and from the results the average earning per share was Kes 8.02 during the period under study with a volatility of 8.81%. The overall least EPS was -7.25 and the highest was 33.21. The standard deviations between and within the firms was 8.78 and 2.9. This implied that EPS mean dispersion was higher between the banks and least within the banks. This indicates that EPS volatility or risk is higher between the banks and least within the banks.

### **Liquidity**

Liquidity for the listed Banks Averaged at about 79.9 % for the period under consideration but with very high volatility of 21.1% with a low 7% and a high of 141%. This meant some banks violated the retention of 20% deposits to loans and ended up borrowing in order to improve liquidity thus increasing the interest cost on borrowed funds. This means that the listed commercial banks on average used about 79.9 % of the Total Deposits for onward lending and therefore retained only the statutory minimum of 20%. This could have been fuelled by the fact that, in Kenya Customers deposits are relatively cheap due to the huge interest difference between the lending interest rates and deposits interest rate hence most banks prefer Customers Deposits rather than borrowing. The standard deviation between and within banks was at 20.2% and 8.8 % respectively, implying that the liquidity risk was higher between the banks and low within the banks.

#### 4.4 Specification Tests:

The Specification tests or analysis are carried out in order to test the suitability of the model in the study at hand. This helps improve on the robustness's and reliability of the coefficients of the variables. In this study the specification tests included Multi collinearity, Unit root/Stationarity, Hausman test and Autocorrelation.

##### 4.4.1 Multi Collinearity Test

This test helps identify highly correlated variables causing collinearity in the data set. The problem of Multi collinearity reduces reliability of the statistical results obtained from the model. The test was done using the Correlation Coefficient Test and the VIF Test. The table below shows the level of collinearity for the variables used in this study. Gujarati, 2007 argues that a correlation coefficient of 0.8 and above between the independent variables indicates multi collinearity problem and as such one of the correlated variables should be dropped. From the results below the coefficients are below 0.8 and hence no multi collinearity.

	incomdiv	car	npl	me	earngabty	liq
incomdiv	1.0000					
car	0.2560 0.0149	1.0000				
npl	-0.4175 0.0000	0.1769 0.0953	1.0000			
me	-0.3416 0.0010	0.0065 0.9516	0.4726 0.0000	1.0000		
earngabty	0.0355 0.7398	-0.1304 0.2206	-0.3516 0.0007	-0.6132 0.0000	1.0000	
liq	-0.1133 0.2876	-0.1679 0.1136	-0.2729 0.0093	0.3411 0.0010	-0.0960 0.3680	1.0000

**Table 6: Correlation Coefficient Table**

##### Variance Inflation Factor (VIF)

Gujarati, 2007 argues that VIF above 10 indicates existence of Multicollinearity. He argues that the rule of thumb in this case is VIF of 10 and above will occur if  $R_i^2$  exceed 0.8 and therefore the variable in question will be highly collinear. The Table below presents the VIF results for the variables under study.

<b>Variable</b>	<b>VIF</b>	<b>1/VIF</b>
<b>me</b>	<b>2.57</b>	<b>0.388624</b>
<b>npl</b>	<b>1.80</b>	<b>0.554907</b>
<b>earngabty</b>	<b>1.67</b>	<b>0.598169</b>
<b>liq</b>	<b>1.59</b>	<b>0.627356</b>
<b>car</b>	<b>1.07</b>	<b>0.935108</b>
<b>Mean VIF</b>	<b>1.74</b>	

**Table 7: Variance Inflation Factor (VIF)**

The above tables indicates VIF of 1.74 which is below 10 as recommended by Gujarati, 2007 implying there was no multicollinearity between the variables.

#### **4.4.2 Unit Root Test/Stationarity.**

The Stationarity test was carried out using the Levin-lin chu Model and Harris-Tzavalis unit root test. The purpose of this test was to confirm that statistical properties such as mean, variance and Autocorrelation remain constant overtime for all the variables in the panels as described below. The null hypothesis was tested at 5% confidence level.



## Unit Root Test for the Independent variables

### Unit Root Test Capital Adequacy

#### Levin-Lin-Chu unit-root test for car

Ho: Panels contain unit roots	Number of panels =	9
Ha: Panels are stationary	Number of periods =	10
AR parameter: Common	Asymptotics: N/T ->	0
Panel means: Included		
Time trend: Not included		
ADF regressions: 1 lag		
LR variance: Bartlett kernel, 6.00 lags average (chosen by LLC)		

	Statistic	p-value
Unadjusted t	-6.7566	
Adjusted t*	-3.9609	0.0000

**Table 10: Unit root test for capital adequacy**

From the above results both the P value  $< 0.05$  hence not significant. This concludes that we reject the Ho and Accept the Ha that the Capital Adequacy ratio for the panels is Stationary.

### Unit Root Test for Asset Quality.

#### Levin-Lin-Chu unit-root test for npl

Ho: Panels contain unit roots	Number of panels =	9
Ha: Panels are stationary	Number of periods =	10
AR parameter: Common	Asymptotics: N/T ->	0
Panel means: Included		
Time trend: Not included		
ADF regressions: 1 lag		
LR variance: Bartlett kernel, 6.00 lags average (chosen by LLC)		

	Statistic	p-value
Unadjusted t	-3.8752	
Adjusted t*	-0.9344	0.1750

**Table 11: Unit Root test for NPLs**

From the results above the P value  $> 0.05$  hence we accept the null hypothesis and conclude that the asset quality as measured by the NPLs has unit roots and reject the Alternative hypothesis.

## Unit Root Test for Management Efficiency

Levin-Lin-Chu unit-root test for me

Ho: Panels contain unit roots  
 Ha: Panels are stationary

Number of panels = 9  
 Number of periods = 10

AR parameter: Common  
 Panel means: Included  
 Time trend: Not included

Asymptotics: N/T -> 0

ADF regressions: 1 lag  
 LR variance: Bartlett kernel, 6.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-6.1031	
Adjusted t*	-3.3960	0.0003

**Table 12: Unit Root Test for Management Efficiency**

The above output indicates that the p value < 0.05 hence we reject the Null and conclude that the management efficiency panels as measured by cost to income ratio are stationary hence do not contain unit roots.

## Unit Root Test for Earning Ability

Levin-Lin-Chu unit-root test for earngabty

Ho: Panels contain unit roots  
 Ha: Panels are stationary

Number of panels = 9  
 Number of periods = 10

AR parameter: Common  
 Panel means: Included  
 Time trend: Not included

Asymptotics: N/T -> 0

ADF regressions: 1 lag  
 LR variance: Bartlett kernel, 6.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-4.2402	
Adjusted t*	-2.4376	0.0074

**Table 13: Unit root Test for Earnings Ability**

The table above shows that the p value < 0.05 and therefore we reject the null hypothesis and conclude that earning ability as measured by the Earning per share is Stationary.

## Unit Root Test for Liquidity

Levin-Lin-Chu unit-root test for liq

Ho: Panels contain unit roots	Number of panels =	9
Ha: Panels are stationary	Number of periods =	10
AR parameter: Common	Asymptotics: N/T ->	0
Panel means: Included		
Time trend: Not included		

ADF regressions: 1 lag

LR variance: Bartlett kernel, 6.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-4.1277	
Adjusted t*	-0.2575	0.3984

**Table 14: Unit Root Test for Liquidity**

The table above shows that the p value > 0.05. This indicates that bank liquidity as measured by the ratio of loans to total deposits is Non Stationary hence we accept the null hypothesis that the panels contain the unit roots.

## First Differencing

Panel Unit-root test for constant after taking first difference for Asset quality.

Upon performing the first differencing the table below indicates that the p Value < 0.05 and hence we reject the null hypothesis that the variable asset quality as measured by NPLs contain unit roots and conclude the NPLs for the period are stationary.

Levin-Lin-Chu unit-root test for D.npl

Ho: Panels contain unit roots	Number of panels =	9
Ha: Panels are stationary	Number of periods =	9
AR parameter: Common	Asymptotics: N/T ->	0
Panel means: Included		
Time trend: Not included		

ADF regressions: 1 lag

LR variance: Bartlett kernel, 6.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-10.2969	
Adjusted t*	-6.7752	0.0000

**Table 15: Unit root test for Assets Quality after First differencing.**



From the table above the p value > 0.05 hence we reject the alternative hypothesis and conclude that the unit roots exists even after taking the first difference and a trend.

#### 4.4.3 Hausman Test

The Hausman test (1978) is used to solve the dilemma whether to use the random effects or the fixed effects estimators. The Null hypothesis is RE (Random Effects) while the alternative is the use of FE (Fixed Effects).i.e. if the p value < 0.05 the Fixed Effects is preferred for the study otherwise the Random Effects is preferred.

OLS Model output

Source	SS	df	MS	Number of obs	=	90
Model	.117356288	5	.023471258	F(5, 84)	=	9.48
Residual	.207872573	84	.002474673	Prob > F	=	0.0000
				R-squared	=	0.3608
				Adj R-squared	=	0.3228
Total	.325228862	89	.003654257	Root MSE	=	.04975

incomdiv	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
car	.8155441	.2552909	3.19	0.002	.3078701	1.323218
npl	-.2765779	.0646972	-4.27	0.000	-.4052354	-.1479203
me	-.0871086	.0603513	-1.44	0.153	-.2071237	.0329065
earngabty	-.0016572	.0007731	-2.14	0.035	-.0031946	-.0001198
liq	-.0446869	.0315782	-1.42	0.161	-.1074835	.0181097
_cons	.4022601	.0564593	7.12	0.000	.2899845	.5145357

**Table 18: Pooled OLS Results**

The table above shows the model explains about 36.08% of the variations are explained by the factors tested with an F statistic of 9.48 and a P value <0.05 hence the model is statistically significant. However the coefficient of the variables includes both entity and time variations hence very difficult to interpret thus making the p-values unreliable. Additionally this model assumes all cross-sections equally behave in response to the changes in independent variables.

## Random Effects out Put

```

Random-effects GLS regression              Number of obs   =       90
Group variable: bank                      Number of groups =        9

R-sq:                                     Obs per group:
  within = 0.1387                          min =           10
  between = 0.5453                          avg =           10.0
  overall = 0.3410                           max =           10

corr(u_i, X) = 0 (assumed)                 Wald chi2(5)    =       30.73
                                           Prob > chi2     =       0.0000

```

incomdiv	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
car	.4087185	.2560298	1.60	0.110	-.0930907	.9105278
npl	-.2324743	.0595683	-3.90	0.000	-.3492259	-.1157226
me	-.1094156	.0640581	-1.71	0.088	-.2349672	.016136
earngabty	-.0021545	.0009341	-2.31	0.021	-.0039853	-.0003236
liq	-.0408279	.0336871	-1.21	0.226	-.1068534	.0251977
_cons	.4758527	.0608514	7.82	0.000	.3565862	.5951192
sigma_u	.01241791					
sigma_e	.03772879					
rho	.09774223	(fraction of variance due to u_i)				

**Table 19: Random Effects Results**

From the table above the Wald chi test has been used to test for model fitness with a P value of below 0.05 indicating the model is ok , with a within R-sq of 13.87%, between 54.53% and an overall R-sq. of 34.10 %. Upon running the Breush Pagan Test, the following output was generated confirming that the Random effects was preferred over the Pooled OLS. P value < 0.05 thus rejecting the null hypothesis Zero Variances across groups and accept the alternative hypothesis that there exists variances across the groups.

Breusch and Pagan Lagrangian multiplier test for random effects

incomdiv[bank,t] = Xb + u[bank] + e[bank,t]

Estimated results:

	Var	sd = sqrt(Var)
incomdiv	.0036543	.0604504
e	.0014235	.0377288
u	.0001542	.0124179

Test: Var(u) = 0

chibar2(01) = 23.36  
 Prob > chibar2 = 0.0000

**Table 20: Breusch Pagan Results**

## Fixed Effects out Put

The table below show the results of the Fixed effects Model. The R sq for the within panels variation is 22.83%, between Panels 6.73% and the overall Rsq is 10.71%. Additionally The F test for the model is less than 0.05 indicating the model is significant. The correlation between the errors and regressors is -0.3666 and interclass correlation (rho) is 64.89%. The sigma of residuals within the groups is 5.129% while the sigma of the overall error term is 3.77%

Fixed-effects (within) regression		Number of obs = 90				
Group variable: bank		Number of groups = 9				
R-sq:		Obs per group:				
within = 0.2283		min = 10				
between = 0.0673		avg = 10.0				
overall = 0.1071		max = 10				
corr(u_i, Xb) = -0.3666		F(5,76) = 4.50				
		Prob > F = 0.0012				
incomdiv	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
car	-.1431335	.2518037	-0.57	0.571	-.6446441	.358377
npl	-.1641826	.0524951	-3.13	0.002	-.2687357	-.0596294
me	-.1382946	.0897816	-1.54	0.128	-.3171101	.0405209
earngabty	-.0051299	.0017669	-2.90	0.005	-.008649	-.0016108
liq	-.0239721	.0497545	-0.48	0.631	-.1230668	.0751225
_cons	.5832457	.0891425	6.54	0.000	.4057029	.7607885
sigma_u	.05129837					
sigma_e	.03772879					
rho	.64896005	(fraction of variance due to u_i)				

**Table 21: Fixed Effects Results**

From the Hausman test the following is the output results. The P value is <0.05 hence the Null hypothesis was rejected and Fixed Effects Model preferred hence accept the alternative hypothesis.

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) re	(B) fe		
car	.4087185	-.1431335	.5518521	.0463268
npl	-.2324743	-.1641826	-.0682917	.0281539
me	-.1094156	-.1382946	.028879	.
earngabty	-.0021545	-.0051299	.0029754	.
liq	-.0408279	-.0239721	-.0168557	.

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V\_b-V\_B)^(-1)](b-B)  
 = 43.15  
 Prob>chi2 = 0.0000  
 (V\_b-V\_B is not positive definite)

**Table 22: Haussmann Test**

## 4.5 Post Estimation Analysis

### Diagnostics Tests for Fixed Effects Model.

The diagnostics tests or analysis are carried out in order to test the suitability of the model in the study at hand. This helps improve on the robustness's and reliability of the coefficients of the variables. In this study the following diagnostics tests were carried out Time –Fixed Effects, Autocorrelation, Heteroscedasticity, and Normality of residuals.

#### 4.5.1 Testing for Time –Fixed Effects

The purpose of this test was to confirm whether the fixed effects are needed when running the fixed effects model. The output below show the results from time fixed effects test.

```
. testparm i.year

( 1) 2011.year = 0
( 2) 2012.year = 0
( 3) 2013.year = 0
( 4) 2014.year = 0
( 5) 2015.year = 0
( 6) 2016.year = 0
( 7) 2017.year = 0
( 8) 2018.year = 0
( 9) 2019.year = 0

      F( 9, 67) = 4.54
      Prob > F = 0.0001
```

The output shows the p value < 0.05 and all the years under consideration have a dummy value of zero and therefore time –fixed effects exist and will be accounted for.

#### 4.5.2 Testing for Heteroskedasticity

The Modified Wald test was used to test for heteroscedasticity in the fixed effect model. The Null hypothesis (Ho) being Homoscedasticity while the alternative (Ha) is availability of heteroscedasticity. i.e. when the Chi Value > 0.05 it indicates the data is Homoscedastic and if the Chi value < 0.05 there data is heteroscedastic. The table below shows the Modified Wald test output for the model used in the study.

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

**H0:  $\sigma(i)^2 = \sigma^2$  for all  $i$**

**chi2 (9) = 21.63**  
**Prob>chi2 = 0.0101**

From the table above the chi test results is  $< 0.05$  hence the data is suffering from heteroscedasticity. To make the model and coefficient reliable heteroscedasticity was eliminated from the model by incorporating robust errors however most the p values were insignificant. The fitted model employed GLS in order to account for this challenge.

```
Fixed-effects (within) regression      Number of obs   =      90
Group variable: bank                  Number of groups =       9

R-sq:                                  Obs per group:
  within = 0.2283                       min =      10
  between = 0.0673                      avg =     10.0
  overall = 0.1071                      max =      10

corr(u_i, Xb) = -0.3666                  F(5,8)          =       2.17
                                          Prob > F        =     0.1581
```

(Std. Err. adjusted for 9 clusters in bank)

incomdiv	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
car	-.1431335	.1744024	-0.82	0.436	-.5453061	.2590391
npl	-.1641826	.0570356	-2.88	0.021	-.2957068	-.0326583
me	-.1382946	.1223874	-1.13	0.291	-.4205204	.1439313
earngabty	-.0051299	.0027062	-1.90	0.095	-.0113705	.0011107
liq	-.0239721	.0749593	-0.32	0.757	-.1968286	.1488843
_cons	.5832457	.1522159	3.83	0.005	.2322353	.9342561
sigma_u	.05129837					
sigma_e	.03772879					
rho	.64896005	(fraction of variance due to u_i)				

**Table 23: Fixed Effects with Robust Errors**

### 4.5.3 Normality tests of residuals

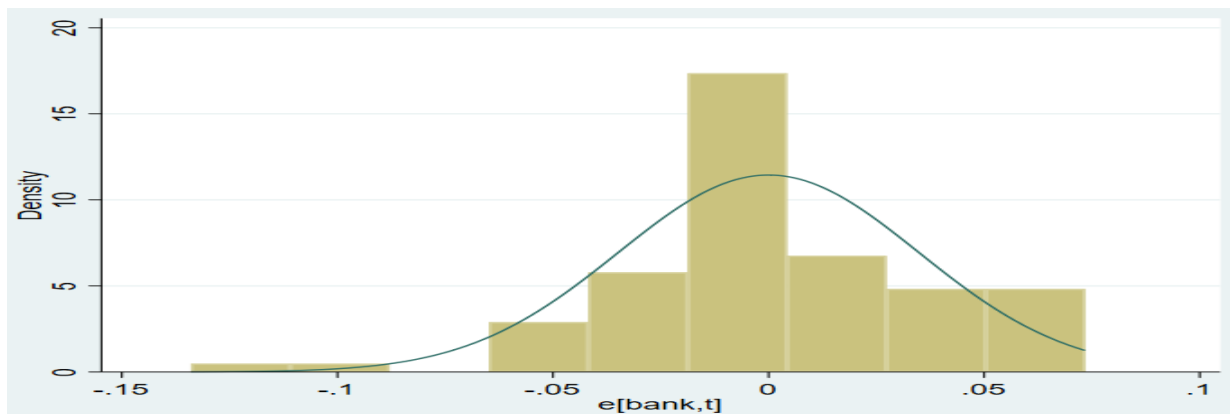
Normality of residuals is a key assumption in regression analysis. To confirm the normality of residuals the normality test was done as part of the post estimation analysis. The study

employed normality of the data test using the Skewness and Kurtosis, QQ plots and the PP plots and Shapiro Wilk Test.

Data Skewness indicates the lack of asymmetry in the data under study while the Kurtosis depicts the shape portrayed by the data under study.

### **Skewness and Kurtosis.**

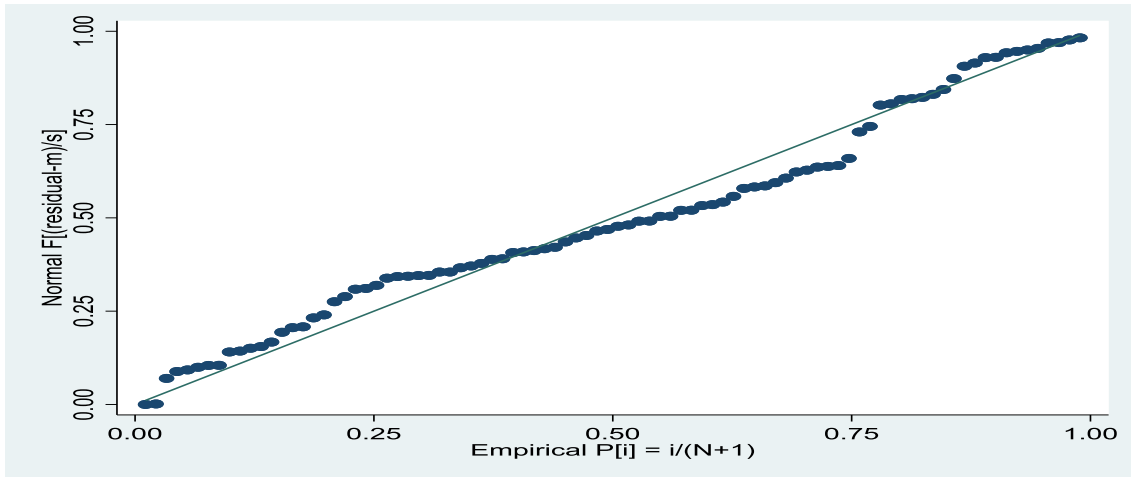
The graph below shows the output for Skewness and Kurtosis. From the graph below the data is normally distributed however it's highly peaked.



**Figure 2: Skewness and Kurtosis**

### **The P-P Plots for Residuals**

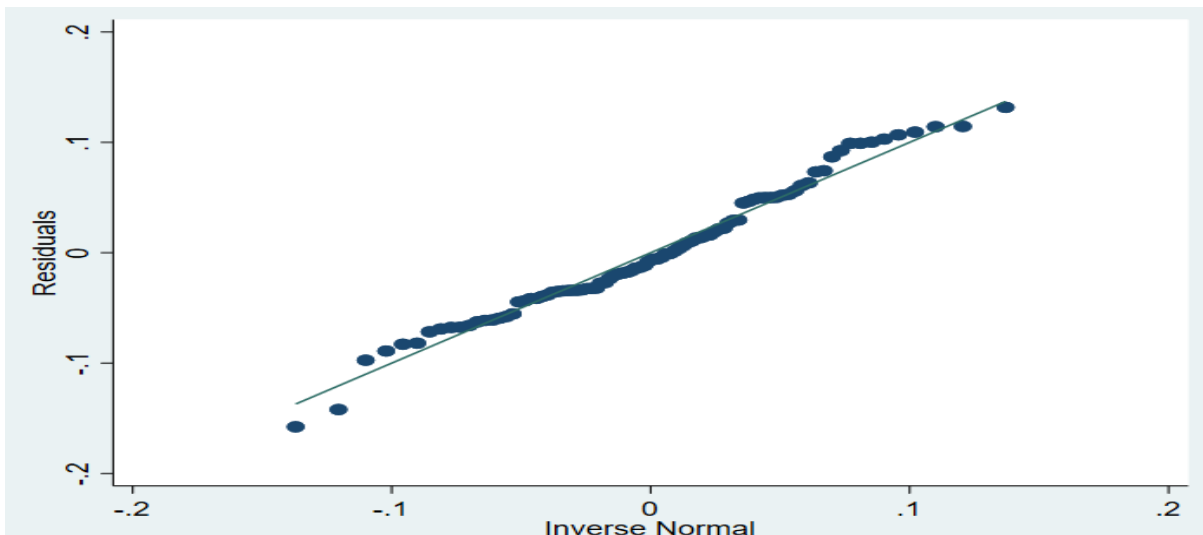
The PP plots are standardized normal probability graphs and usually sensitive to non-normality in the middle range of the data under study. The graph below show the data is almost normal but with non-normality in the middle.



**Figure 3: PP lots for Residuals**

### QQ Plots for Residuals

The QQ graphs plots the quantiles of a variable against the quantiles of a normal distribution therefore its sensitive to non-normality near the tails. The graph below shows the normal distribution of residuals on QQ graph plot.



**Figure 4 : QQ plots for Residuals**

From the graph above, the q norm shows the data is normally distributed however with slight deviation from the normal at the lower and upper tail ends.

## Shapiro-Wilk Test

The Shapiro Wilk test of normality is based on the assumption that data is normally distributed. For P-Value > 0.05 we fail to reject the Null hypothesis and conclude that the data is normally distributed however for P –Value < 0.05 reject the null hypothesis and accept the alternative hypothesis that the data is not normally distributed. The output below show that, according Shapiro-Wilk test we fail to reject the null hypothesis and conclude that the data is normally distributed since the P Value > 0.05.

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
r	90	0.97869	1.612	1.052	0.14629

## 4.5.4 Serial Correlation Test

This problem is associated with macro panels (with very long study period) however it's not very common or a challenge in micro panel. In order to arrest the problem of serial correlation, the author ran an AR (1) for the Fixed Effect model which produced the results as below.

```
FE (within) regression with AR(1) disturbances   Number of obs   =   81
Group variable: bank                           Number of groups =    9

R-sq:
  within = 0.0521
  between = 0.0675
  overall = 0.0658

Obs per group:
  min = 9
  avg = 9.0
  max = 9

corr(u_i, Xb) = -0.0371                       F(5,67)         =   0.74
                                                Prob > F         =   0.5992
```

incomdiv	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
car	.2682768	.2529715	1.06	0.293	-.2366563 .7732099
npl	-.0709845	.0557256	-1.27	0.207	-.1822133 .0402443
me	-.0235301	.0980813	-0.24	0.811	-.2193012 .1722409
earngabty	-.0014704	.0019199	-0.77	0.446	-.0053026 .0023618
liq	.0394349	.0530501	0.74	0.460	-.0664535 .1453234
_cons	.3518291	.0530368	6.63	0.000	.2459673 .457691
rho_ar	.44750871				
sigma_u	.04932666				

**Table 24: Serial Correlation Results**

The table show that the modified overall R-squared is 6.58% with an interclass Autoregressive variance of 44.75% and standard deviation of the overall error term of 4.93%.

## 4.6 Model Fitting

In order to make a summary of the model incorporating all the diagnostics test especially on heteroscedasticity and Autocorrelation, the GLS method was adopted to generate the output of the fitted model. The method appropriately accounts for heteroscedasticity and autocorrelation which is usually not the case with regression i.e. Regression does not allow for proper modelling for the Autocorrelation .Below is a table showing the summary of coefficients, standard errors, number of observations among others.

Cross-sectional time-series FGLS regression

Coefficients: generalized least squares  
Panels: heteroskedastic  
Correlation: no autocorrelation

Estimated covariances	=	9	Number of obs	=	90
Estimated autocorrelations	=	0	Number of groups	=	9
Estimated coefficients	=	6	Time periods	=	10
			Wald chi2(5)	=	85.05
Log likelihood	=	154.6818	Prob > chi2	=	0.0000

incomdiv	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
car	.441716	.2192044	2.02	0.044	.0120833	.8713487
npl	-.2367159	.0430415	-5.50	0.000	-.3210757	-.1523561
me	-.1333036	.0461006	-2.89	0.004	-.2236591	-.042948
earngabty	-.0015619	.0005765	-2.71	0.007	-.0026918	-.0004319
liq	-.0280612	.0221056	-1.27	0.204	-.0713873	.015265
_cons	.4641652	.0498776	9.31	0.000	.3664068	.5619235

**Table 25: Model Coefficient's**

From the output above the fitted model was transformed from the original model as follows;

Original Mathematical Model,

$$Y = B_0 + B_1 X_{1it} + B_2 X_{2it} + B_3 X_{3it} + B_4 X_{4it} + B_5 X_{5it} + \omega_{it}$$

Where,  $X_1$ = Capital Adequacy,  $X_2$ = Assets Quality,  $X_3$ =Management Efficiency,  $X_4$ =Earning Ability,  $X_5$ =Liquidity and  $W_{it}$ =Error Term.

The Fitted Regression model is as follows,

$$\hat{Y} = 0.464 + 0.442X_1 - 0.237X_2 - 0.133X_3 - 0.002X_4 - 0.028X_5$$

The overall model is statistically significant with a P value of  $Chi^2=0.000$  and a Wald Chi of 85.05. The coefficients of the model indicates that capital adequacy has the highest effect on Income diversification, one unit rise in capital adequacy leads to 44.2% increase in income diversification Ceteris Paribas. Asset quality has a negative effect on income diversification whereby one unit increase in non-performing loans leads to decrease in income diversification by 23.7% assuming all other factors a held constant. Management Efficiency and Earning Ability independently have negative effect on income diversification. One unit increase in management efficiency leads to a decrease in income diversification by 13.3% while increase in earning ability by one unit leads to a decrease in income diversification by 0.2%. A unit change in liquidity leads to a 2.8% decrease in income diversification however this effect was not conclusive since the confidence interval range was between a negative and positive value i.e. between -0.71 to 0.15. Lastly holding all the factors in the model constant, income diversification as explained by the Y intercept was at 46.4%.

#### **4.7 Hypothesis Testing**

Hypothesis testing was done using the Table 26 above,

##### **4.7.1 Capital Adequacy has no effect on incomes diversification of listed Commercial banks in Kenya**

The results of the model leads to the rejection of the null hypothesis that capital adequacy has no significant effect on income diversification of listed commercial banks. The hypothesis was rejected at 5% confidence level since the P value( 0.44) was significant and accepted the alternative hypothesis that capital adequacy has a positive significant effect on income diversification. This findings agrees with Nzioki (2011), Ongore & Kusa (2013) and Sikolia

and Miroga (2018) who found out that capital adequacy had a positive effect on bank performance.

#### **4.7.2 Asset Quality has no effect on the income diversification of listed commercial banks in Kenya.**

The second null hypothesis was Asset Quality has no effect on the income diversification in listed commercial banks in Kenya. From the model output the hypothesis was rejected at 5% confidence level and accepted the null hypothesis implying that Asset Quality has a significant negative effect on the income diversification. This outcome disagrees with Tennant & Lutherland (2014) as quoted by Kamande (2017) who argued that there was no relationship between Asset quality and non-interest income diversification. Additionally the results contradict the outcome and conclusion by Sikolia and Miroga (2018) and Sakwa et al (2019) who argued that asset quality was positively but insignificantly correlated to the banks performance.

#### **4.7.3 Management efficiency has no effect on income diversification of listed Commercial banks in Kenya.**

This null hypothesis was rejected at 5% level of confidence and concluded that management efficiency has a negative significant effect on income diversification. The output of this study however differs or contradicts Sang (2017) and Olerewaju et al (2017) who found out that operational efficiency as measured by cost to income ratio had positive income diversification.

#### **4.7.4 Earning ability in banking has no effect on income diversification of listed Commercial banks in Kenya.**

From the results above the calculated p value for earnings ability was 0.007 which is less than the critical p value of 0.05 with a negative interval. Therefore the Null hypothesis was

rejected and conclude that Earning Ability has a weak negative effect on income diversification.

#### **4.7.5 Liquidity has no effect on the income diversification of listed commercial banks in Kenya.**

In this particular hypothesis the model was inconclusive on the effect of liquidity on the income diversification. This is because despite the negative coefficient of the liquidity and the insignificant p value of 0.204 against the critical p value of 5%, the confidence interval coefficients range led to inconclusive effect. It can be positive, negative or no effect at all based on the coefficient of confidence range (-0.071-0.015). Therefore the study failed to reject or accept the hypothesis. Therefore the study does not contradict or agree with results from previous studies by Weeresainghe and Raviwa, (2013), Ongore and Kusa (2013) who concluded that liquidity has an inverse relationship to the bank profitability and Larteyl et al (2013) who concluded that liquidity has insignificant relationship with financial performance or Nyamasege et al, (2014) who concluded that liquidity has a strong positive correlation to the profitability.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter entail the summary of the findings as depicted from the analysis of the empirical study with respect to research objectives and hypothesis guiding the study. The chapter also entails conclusions and recommendations for further research.

#### **5.2 Summary of the findings and Conclusions**

##### **5.2.1 Capital Adequacy and Income diversification.**

The first objective was to determine how the capital adequacy influence's the income diversification in commercial banks. The findings of this study revealed that, there was positive and significant association between the capital adequacy and the income diversification of commercial banks. This implies that banks that meet the capital adequacy levels and probably exceed are able to invest in diversified sources of income thus increasing their capacity to generate more revenue. Additionally it may imply that the banks are able to invest the excess capital in order to reduce costs of holding idle capital.

##### **5.2.2 Asset Quality and Income Diversification.**

The second objective of the study was to find out the effect of Asset Quality on Income diversification in listed commercial banks. The study revealed that Asset quality had a negative significant association with income diversification. This implied that banks with poor quality assets as measured by NPLs had poor ability to diversify incomes sources. This also implied that banks with high asset quality as measured by low NPLs ratios were able to diversify incomes more hence they are more profitable compared to banks with high NPLs ratios.

### **5.2.3 Management Efficiency and Income Diversification.**

The third objective of the study was to appraise the effect of the Management efficiency on Income diversification in listed commercial banks. This objective was measured by the ability of the senior management to reduce cost in an environment that required income diversification as measured by cost to income ratio. The study revealed that management efficiency negatively but significantly affected the ability of the commercial banks to employ income diversification.

### **5.2.4 Earnings Ability and Income Diversification.**

The fourth objective was to evaluate the effect of earning ability on income diversification of listed commercial banks. The study found out that earnings ability had a weak significant negative effect on income diversification.

### **5.2.5 Liquidity and Income Diversification.**

The Fifth and last objective of the study was to Assess the effect of liquidity on income diversification in listed commercial banks. The study was inconclusive on the effect of liquidity on income diversification and hence did not reject nor accept the null hypothesis.

## **5.3 Conclusions and Recommendations**

The study aimed at establishing the effect of bank specific factors on income diversification of listed commercial banks at the Nairobi Securities Exchange. The factors considered were capital adequacy, Asset quality, Management efficiency, Earnings Ability and Liquidity. The dependent variable was Income Diversification as measured by the HH index. Below is a discussion on the conclusions and recommendations based on the study outputs.

Capital adequacy is major factor considered in determining the health of bank institution. The bank supervisory authority has set minimum levels of capital adequacy that a bank must meet in order to stay afloat which is set at 14.5 % of core capital. From the study most of the banks had achieved this minimum and surpassed it implying they held excess capital. Capital

adequacy has positive significant effect on income diversification and therefore banks should invest such excess capital in income diversifying sources since idle capital attracts costs which may affect the efficiency of the bank. Additionally capital provides a buffer in case of liquidity challenges and as such should be efficiently invested in income diversification to generate more incomes.

Asset Quality had negative significant relationship to income diversification. This implies that rise or growth in non-performing loans reduces income diversification in a bank while improvement in NPAs favor's income diversification. Therefore it is deemed important that banks invest in credit risk measures, technology and recoveries in order to reduce exposure to non-performing loans and hence improve their capacity to diversify incomes.

Management efficiency had a negative significant effect on income diversification. This implied that rise in costs negatively affected income diversification for the listed commercial banks in significant manner. Therefore it's prudent that senior management of banks cascades workable solutions to manage costs and bring the costs to manageable levels as incomes grow. Management of costs and growth in incomes improves management efficiency as measured by the cost to income ratio.

Earning Ability was measured by the EPS and the study found that the parameter had a weak negative association to income diversification or almost no relationship with income diversification. This implied growth in value of shareholders had weak negative association with income diversification.

Liquidity is a major parameter in bank examination and supervisory tool. In this study liquidity effect on income diversification was inconclusive. This implies that liquidity in banking positively, negatively and in some instances has no effect on income diversification. This creates a dilemma on the effect of liquidity on income diversification. The study recommends further research on this parameter in order to establish the actual effect of

liquidity on income diversification considering liquidity is a non-negotiable necessity in banking.

#### **5.4 Suggestions for Further Studies.**

The study employed bank specific factors based on the CAMEL model and their effects on the income diversification, however it's prudent to note that banks specific factors are wide and many. It is therefore important that future studies can employ other factors not considered in this study and test their effects on income diversification. The study measured the dependent variable based on HH index formula however future studies can employ other methods to measure diversification like geographical diversification, product diversification or share of Non-Funded Incomes against Total Incomes among others. In the current study, some parameter like earning ability as measured by EPS had weak significance levels to income diversification and therefore future studies can consider using a different metric and test the effect. It is also prudent to note that the current study did not moderate the variables either with other internal factors or macro factors that equally influence income diversification. Therefore future studies can consider moderating the effect of bank specific variables on income diversification with either internal factors like bank size or macro factors like inflation rate or monetary policy like interest rate among others. As recommended above further studies on effect of liquidity in income diversification are encouraged probably using wider scope or a bigger sample if not all the banks. The study employed micro-panel data analysis technique, probably a similar study can be done based on time series approach for the entire banking industry or macro-panel data analysis technique.

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

The current study required a lot of secondary data which despite the availability in journals and published reports required a lot of internet data to access. Secondly the study covered data collection for a period of 10 years which demanded substantial amount of time to collect

and analyze before making the final conclusions. Literature on bank specific factors and their effect on income diversification was not available and this created a gap in this study hence relying heavily on materials discussing effect of bank specific factors on financial performance of banks. Lastly the study did not consider the financials for the year 2020 despite their availability. This was because of the COVID 19 pandemic which affected the banks and the entire financial system as such various regulations and policies were relaxed by the regulators during the year hence the reports were considered not to reflect the actual status during that period.



## APPENDIX 2; LISTED COMMERCIAL BETWEEN 2010 AND 2021

NB: Bank Code is arbitrarily allocated from 1-13 as follows

ABSA/BBK	1
STAN BIC	2
I&M	3
DTB	4
HF	5
KCB	6
NBK	7
NCBA	8
STANCHART	9
EQTY	10
COOP	11
BK PLC	12
NIC	13

### APPENDIX 3 SAMPLED COMMERCIAL BANKS

ABSA/BBK	1
STAN BIC	2
DTB	3
HF	4
KCB	5
NBK	6
STANCHART	7
EQTY	8
COOP	9

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