

**MARKET CONCENTRATION, RISK-TAKING AND PERFORMANCE OF  
COMMERCIAL BANKS IN KENYA**

**BY**

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## **DECLARATION**

This research project is my original work and has not been presented for an award in any university/ institution.

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This research project has been submitted for examination with my approval as the university Supervisor.

Dr. Peter Muriu

Signature..... Date.....

## **DEDICATION**

I dedicate this research project to my parents Mr. and Mrs. Onyancha, my brothers Okerio and the late Nyatuka and my sisters Nyamoita and Nyang'ate. You made a difference.

## **ACKNOWLEDGMENT**

I sincerely thank my supervisor Dr. Peter Muriu for suggesting this project and for his guidance, support and constant advice to ensure this work is complete. I also thank my parents Mr. and Mrs. Onyancha for ensuring I get the best education and my brothers and sisters for their support and unconditional love.

## **ABSTRACT**

The Kenyan banking system has gone through several adjustments ranging from mergers, acquisitions and structural reforms with an aim to improve efficiency and profitability. To achieve all these changes, banks face risks that affect their performance. This study investigates how concentrated markets and risk absorption affect performance of banks in Kenya using a panel fixed effects estimation technique for the period 2010 to 2018. Empirical findings reveal that Herfindahl-Hirschman index has no significant relationship with bank performance in Kenya and therefore fails to support the structure-conduct-performance hypothesis. We also found that credit risk negatively affects the performance of banks. Capital risk, liquidity risk, overall risk and bank size have no significant effect on bank performance. Banks should aim to minimize credit risk through prudential credit guidelines and avoid pursuing growth strategies since there is no evidence to support economies of scale in the Kenyan banking system.

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## ACRONYMS

<b>CBK:</b>	Central bank of Kenya
<b>CPI:</b>	Consumer price index
<b>DFIs:</b>	Depots taking financial instructions
<b>EACB:</b>	East Africa currency board
<b>GDP:</b>	Gross domestic product
<b>HHH:</b>	Herfindal-hirshman index
<b>IMF:</b>	International monetary fund
<b>KNBS:</b>	Kenya national bureau of statistics
<b>NBFs:</b>	Non-bank financial institutions
<b>NPL:</b>	Non-performing loans
<b>NSE:</b>	Nairobi securities exchange
<b>ROA:</b>	Return on assets
<b>ROC:</b>	Return on capital
<b>ROE:</b>	Return on equity
<b>US:</b>	United States
<b>WB:</b>	World Bank
<b>WDI:</b>	World development indicator



# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the study

Understanding concentration and risk in banking is crucial considering the important role played by banks of resource allocation, provision of capital and stabilization of the financial system. These roles played by banks also have an effect on their performance, overall economic growth and stability (Zhang et al 2013). During the financial crisis in 2007-2008, performance of banks in developed countries declined. Whereas there was shrinkage in financial performance of advanced economies, there was little bank failures in the developing economies especially in Africa. African markets were resilient to the impact of the crisis because most of their financial systems do not hold the risky securities that started and spread the crisis in the international financial system. Only Nigeria experienced greater effects due to its high dependence on oil coupled with local and international market liquidity, (Nyangito 2009). The 2007-2008 financial crisis precipitated policy debates, which include market power (market concentration), bank performance, competition, financial stability, and risk-taking among others (Zhang et al (2013). The relatively little effect from the financial crisis on bank performance in developing economies gives an opportunity of studying these issues in the Kenyan economy.

There are a number of theoretical debates explaining how concentration and performance relate. In the SCP paradigm, performance and market concentration are positively related. When markets are concentrated, large banks are likely to collude in order to reap high profits Bain (1956). Another study affirms this hypothesis that efficient banks gain more profit and therefore, their market share increase leading to more concentration in the market. Efficient banks are better managed, or employ advanced technology, which in turn lower operation cost hence increasing profits (Demsetz 1973). The quiet life hypothesis is another theory; though it provides a negative concentration performance relationship. In this theory; large firm may operate inefficiently through reducing efforts in operations and enjoy high monopoly profits (Hicks, 1935).

Studies conducted on concentration- performance relationship have not achieved unanimity. Tsions and Delis (2009) accept the quiet life hypothesis while Fernandez de Guevara and

Maudos (2007) reject it according to their studies on European banking sector. In the US banking system, studies conducted by Berger and Hannan (1998) reveal evidence that support the quite life hypothesis. At the same time, Koetter et al., (2012) studied the same US system and their study found that cost efficiency has a positive relationship with market power but profit efficiency exhibit negative relationship with market power

Bank intermediation involves several risks; such risks include business risk, market risk, liquidity risk, credit risk, moral hazard among others. Bank operations involve taking risks, which in turn have an impact on their efficiency (Zhang et al., 2013). If banks take excessive risks, there is a likelihood of bank failures and even financial crises with negative effects in the economy. Research on financial performance and stability has led to emergency of two views; competition-fragility and competition-stability view. The former suggest that competition leads to expansion of risks that a bank takes in order to earn higher returns hence undermining stability, monopoly rents improve raising the value and bank charters value hence discouraging taking of risks (Allen and Gale, 2004). In the latter view, large banks operating as monopoly can increase interest rates hence raise the adverse selection and cause instability in the financial system (Boyd and Nicolo, 2005).

In the above context, this research will seek to determine how concentrated markets and taking of risks affect how banks perform in the Kenyan banking system. This will lead to filling the literature gap and input to the little literature available from a developing economy perspective.

## **1.2 The banking system in Kenya**

The Kenyan banking system has forty-two commercial banks. 25 banks locally owned while 14 are foreign banks and the Kenyan government has majority shareholding in three banks. Banks in Kenya are licensed, regulated and supervised by CBK. As a public regulatory body, it draws its powers from the national payment system and banking acts and the Kenyan constitution (CBK2015). CBK helps to maintain a sound and safe banking system in Kenya (CBK 2017).

After independence, there were 9 banks operating in Kenya which were all foreign owned. The first bank development was to establish a Central Bank to replace the East African Currency Board (EACB), which lacked authority. CBK was established in 1966 and later in September

1966 a national currency- the Kenyan shilling (Kshs) was introduced at a rate of 1 pound to Kshs. 20.

Implementation of several policies to facilitate new entry into the market, promote local participation and increase competition followed. These policies lead to an increase of banks and NBFs in 1980 to 15 and 23 by 1985. The government between 1974 and 1985, (Macton et al., 2014) controlled most bank operations; it directed where the banks were to open new branches and where to direct their credit to without considering on return or commercial risk. It also determined entities where credit was extended to by commercial banks without considering their credit worthiness and the interest rates to be charged which lead to a decline in economic growth from 5.2% in 1978 to 1.3% in 1984.

In 1989, the process of financial reform began. Its aim was to liberalize interest rates, and this was achieved by 1991. There was also abolition of credit guidelines and formation of Capital Markets Authority and the improvement in the operations of DFIs and their finances. These reforms lead to growth in performance of the financial sector more specifically in banks and stimulated further rise on overall economic performance. According to word bank (1992), the sector adopted low interest rate policy and inflation adjustment to achieve stable positive real rates.

After liberalization of the banking sector, there was a general rise in competition. There were new entrants into the market, this lead to modification of how the banking system was structured. This facilitated an upward growth in the banking sector together with other facets in the economy (Kamau and were, 2013). The banks total profits grew to 89.2billion from 1998 to 2014, which was an increase of over 400% while assets to GDP ratio increased to around 67%. There was also growth in bank branches from 670 in 1997 to around 1664 by 2014 (CBK, 2014). Banks also adopted improved technology hence improving efficiency. Data processing and information sharing such as on credit rating of customers become faster (Kamau and Were, 2013). The banking sector grew faster than other sectors of the economy and even beyond the growth of the general economy CBK (2017).

Data from the CBK report of 2014 indicate that NPLs increased because of an increase in interest rates, NPL level rose to 107.1 billion by December 2014. During the same period, the percentage

of non-performing loans compared to total loans taken declined to 5.4% as compared to the previous level of 5.7%. This suggests a reduction in credit risks. Most banks have continued to record high profits indicating capital adequacy strength. For example, in 2014 they posted a ratio of core capital to total deposits of 18% which was higher than the regulatory requirements.

The central bank classifies banks into different levels. Tier 1 banks: these are banks with a balance sheet of 100 billion and above. Tier 2 banks are those banks whose balance sheet is below 100 billion but above 30 billion while tier 3 have a balance sheet of below 30 billion but higher than 5 billion and finally tier 4 banks comprising of those banks with a balance sheet of below 5 billion but above 1 billion (Kamau and Were, 2013). Today there are two banks under statutory management and one in liquidation process.

### **1.3 Statement of the problem**

Banking in Kenya has gone through several adjustments in the last three decades with an aim to liberalize fully the financial system, debt management and budget reform. This liberalization was to provide avenue for banks to compete. The financial liberalization was to increase deposits, savings, credit and growth (Ngugi 2000). However, the results of these reforms have been shallow and fragile. Statistics from central bank of Kenya (CBK) show that there was growth in NPLs to a high of 41% in 2001. This, together with stringent central bank guidelines has led to bank failures in Kenya.

Reforms such as privatization, ownership, risk taking among others have fueled research in banking to determine the impact they in relation to performance in banks. There is scanty evidence studying on how absorption of risks by banks impact on how they finally perform. Kwan and Eisenbeis (1997) studied the US market and found that market performance and risk taking were negatively associated. Another research on the same market by Berger and Young (1997), also reveals the same result. On the other hand, studies on the European market show no unanimity. Altunbas et al., (2007) investigated the determinants of bank profitability. They found that market performance and risk taking have no relationship. When Fiordelisi studied the same market they found that banks which have low capital risk having a better performance (Fiordelisi et al., (2011). Brissims et al., (2008) reveals that bank performance and liquidity risk are positively related while capital and credit risk have a negative relationship with performance.

Most studies show that banks behave in a different way under a different setting; therefore, studies from one country may not be applicable in another as they experience different structure and organizational setting. Kenya implemented structural adjustment programs in 1980s focusing on debt and budget reform. It also carried out financial liberalization in the 1990s financed by the world bank (WB) to de-regularize interest rates with an aim to improve competition. At the beginning of 2001, CBK issued a guideline for banks to conform to Basle capital accord (Basle 1) capital requirements and other CBK guidelines.

The influence of market concentration on performance is debatable. As it may lead to efficiency and financial depth, it would lead to excessive risk taking, which threatens financial stability; therefore, it is prudent to study concentration performance relationship, which forms the basis of this study. In particular, our objective is to provide insights on how risk taking and concentration of banks affect their performance. This research will be among the few studies investigating how concentrated markets and risk absorption in banking affects their performance by considering a single banking sector. Findings from this study should enable us to draw policies, which will be useful to the management of banking sector and policy makers. Consistent with the research problem, we seek to address the following research questions: What is the relationship between market concentration and bank performance? Is there a nexus between performance of banks and risk taking?

#### **1.4 Objective of the study**

The main objective in this study is to examine the impact of market concentration, risk taking and performance of commercial banks in Kenya. Specifically to:

- Examine the relationship between market concentration and bank performance
- Investigate the relationship between risk taking and bank performance.

#### **1.5 Significance of the study**

There are several contributions following this study. First, it adds to the body of research documenting how concentrated markets and risk absorption affect performance of commercial banks. We empirically test presence of quiet life hypothesis and the ESH in an emerging economy. We also test the SCP hypothesis on the Kenyan banking system.

Secondly, empirical results from the study will present new evidence on the relationship that concentrated market concentration have with performance of bank and how risk taking contribute to performance of commercial banks in Kenya. Studying risks that face bank intermediation in particular capital risk, credit risk, liquidity risk together with overall risk and the effects they have on bank performance will provide a detailed knowledge of those risks and suggest policies that may assist regulators implement necessary measures for banking stability.

Finally, the study has policy implication to the government policy makers and the banks. To the government and policy makers it enables them form policies that guide on mergers and acquisitions as mergers lead to concentration which in turn affect performance. It will also inform on reforms to pursue for overall bank success. To banks, studying of risks gives more insight of their impacts on performance therefore assist them make decisions that reduce risk that affect performance negatively.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

Several studies investigating how concentrated markets and risk absorption impacts on bank performance exist. This chapter evaluates the most appropriate theories that are closely related the statement problem. We evaluate the ESH, the SCP and the quiet life hypothesis. Past empirical studies are also evaluated and finally we review the literature for identification of any gaps.

#### 2.1 Theoretical literature

Three theories exist that explain how concentrated markets and risk exposure affect bank performance. These theories are; the quiet life hypothesis, the SCP and ESH.

##### *The quiet life hypothesis*

This theory postulates that in the existence of market power or concentrated markets leads to generation of higher profits through forgone revenue or cost reduction. When firms enjoy market power, managers may relax their efforts and avoid hard decisions but enjoy quiet profits as opposed to competitive markets where managers should implement strong decisions if they want to stay afloat (Hicks 1937). Similarly, if owners of firms or stock market do not monitor firms efficiently, managers are likely to avoid taking hard decisions or avoid difficult operations to enjoy quiet life profits.

##### *The structure/conduct/performance paradigm*

In this theory, market environment has an effect on how markets are structured. The market structure then affects how firms conduct their economic activities, which in turn affect their performance (Bain 1956). The SCP postulates that the market structure affects conduct of firms that finally affects their performance.

From this theory, supply and demand conditions in the industry determine the market structure. These conditions will then influence how firms behave which will affect their performance in the industry. The theory also suggests that there is perfect information and stable equilibrium in that

their products are homogeneous, there are numerous small firms, which are price takers, no barriers to entry and exit of firms, and finally consumers have perfect information about the market. The theory also postulates that there is a positive concentration-performance relationship, as concentrated firms are likely to collude to earn high profits.

### *The efficient structure hypothesis*

According to this theory, performance affects structure. This theory suggest that firms which improving in efficiency gain more market share as opposed to inefficient firms this in turn increase the level of concentration.

When firms are efficient, their share in the market rise, hence increasing concentration level; ESH also states that profit and concentration are positively related. This is due to efficiency by management hence lowering costs. The differences in efficiency among firms in the market will lead to increased concentration, this concentration in turn increase efficiency therefore creating a high profit (Begger and Hannan 1989). The ESH and SCP hypothesis present a similar view on the concentration-performance relationship. The difference only manifest on the interpretation of the relationship.

## **2.2 Empirical Literature**

Concentration and bank performance relationship has attracted several empirical studies. However, the studies conducted have focused on European and US markets and have yielded contradicting results.

Hakimi et al., (2015) tested how concentration affects performance of banks in Tunisia. They used net interest margin (NIM), ROA and ROE to measure the banks pricing efficiency of its services and gross profitability. They sampled data for 9 Tunisian banks for the period 1980 to 2009 and applied panel data analysis. Their results reveal that concentrated markets and profitability exhibit a positive relationship for the banking sector of Tunisian. This study focused on 9 Tunisian banks only which might not reflect the true results for the entire banking sector in Tunisia.

Rinkevičiūtė and Martinkutė-Kaulienė (2014), studied how concentration affects performance. Using HHI index, ROE, ROA and the top 3 banks market share, they investigated how the



profitability ratios are related to performance in the Lithuanian economy. Their finding shows that concentrated markets do not have a direct relationship with profitability.

Fiona (2006) investigated how concentration affects performance of banks in the US. Data for the year 1994 to 2005 was analyzed using panel data analysis; concentration was measured using data of the largest 2% and the largest 5% market share while Profitability was measured using ROE and ROA ratios. The findings indicate that concentration and performance are positively associated.

Jeon and miller (2002) studied the concentration- performance relationship of the banking system in the US. Data for the first 5 banks, the first 10 banks, the HHI concentration index and ROE was employed. From their findings, concentration and ROE have a positive relation. They also note that the relationship runs from increase in concentration to increase in performance and not increase in performance to increase in concentration implying that market power holds for the US banking sector.

To investigate factors that determine profitability in banks, Molyneux and Thornton (1992), using banking Data for European countries between 1986 and 1989 analyzed a linear equation estimation of pooled data. Their results revealed that there is a positive relationship between concentration and ROC. Government ownership and ROC also exhibits a positive association showing that banks under government ownership have a high ROC than their private counterparts. However, the study focused on developed economies alone and did not include any developing economies.

Bourke (1989) studied on how concentration affected performance of commercial banks in Europe, USA and Australia. Using the top three banks and their concentration ratios their results reveals that concentration is positive and significant in determining bank performance. Their study also focused on developed economies ignoring the developing economies.

Research on how risk-taking affect performance of banks is still is scanty. Studies conducted have yielded contradicting outcomes on risk-taking and bank performance relationship. Magnus (2014) investigated how risk-taking affects efficiency of banks in European banking sector. Using the Z-score as a proxy for overall risk, result from the European banking sector shows a

negative Z-score implying that efficiency and risk are positively associated. Banks, which are more efficient have, lower risk while those with lower efficiency faced a high risk.

Altunbas et al., (2007) studied the effect of capital risk on efficiency of banks in the European banking system from 1992 – 2000. However, they found that inefficiency is negatively associated with risk, although in banks that were least efficient they found that risk and inefficiency had a positive relationship. This positive association is because of the inability of the banks to take more risks due to cost constraints as they are more reserve oriented.

Kwan and Eisenbeis in 1997 researched on how bank risk-taking and capitalization affects operating efficiency to prove the moral hazard hypothesis on US banking system. In their study using simultaneous equations they found inefficiency to have a positive relation not only with capitalization but also on credit risk and interest rate risk suggesting that banks performing poorly face more risks as compared to those that perform better.

### **2.3 Overview of Literature Review**

The theoretical literature provides three theories that explain how concentration and risk-taking affect bank performance; the SCP, the quiet life hypothesis and the ESH.

The empirical literature presents studies conducted both in developed and emerging economies. All studies employed different techniques to analyze the data and there is no unanimity in their results. This makes it difficult to conclude on the nature of the relationship.

Majorly, these studies conducted have been on developed economies, hence the results obtained applies only to a developed economy perspective, which might not be applicable to developing economies such as Kenya.

From the literature review, bank specific, macroeconomic and country specific factors are paramount in determining how concentrated markets and risk absorption impact performance of banks. It is also evident that banks behave different under different economies and institutional setting, therefore results obtained in one country may not be applicable to other countries.

## CHAPTER THREE

### METHODOLOGY

#### 3.0 Introduction

The methodology applied to explain how concentrated markets and risk-taking affects performance in banking is outlined in this chapter. It lays out the theoretical framework, the study variables, together with data sources and the appropriate diagnostic tests were conducted before data was analyzed.

#### 3.1 Theoretical Framework

From the onset of studies on concentration and performance, two distinct approaches have emerged that show how concentration and performance relate: structural and the non-structural approaches. Structural approaches provide that market power or concentrated markets can explain the market structure. Since Performance is a structural phenomenon, studies on performance have employed structural approaches.

Most studies on bank concentration and performance have indicated that concentration is better measured using a concentration ration called the Herfindall-Hirschman index, this index is obtained by taking the square of market share of each bank an then sum the squares i.e. bank sizes.

HHI index is presented as follows:

$$HHI = \sum_{i=1}^N S^2$$

Where: N =is total number of banks while S is the total assets of bank i.

An index ranging between  $\frac{1}{N}$ , banks have equal size while an index of 1 shows monopoly.

If the HHI index is below 0.10, the banking sector will be exhibiting a competitive market structure whereas if the index ranges from 0.01 - 0.10 it will show a market that is un-concentrated, if it ranges from 0.1 - 0.18 it will show a market that is moderately concentrated and an index of above 0.18 shows a concentrated market.

This study, makes the assumption that either the SCP, the EHS in which a different direction of causality is provided in that efficient banks attract more profit which make them gain more market power, Therefore, leading to a concentrated market or the quiet life hypothesis exist. Therefore, market concentration and risk taking can affect performance of banks either positively or negatively. Further assumption is that bank operations involve a number of risks; therefore, if they take excessive risks, there would be failures, which can also lead to financial crisis in an economy.

The study relates performance with concentration and risk factors. Market concentration will be presented through the HHI index while capital risk, credit risk, liquidity risk and overall risk will be the risk factors.

### 3.2 Empirical Framework

The empirical model will be as follows:

$$PERF_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 \sum_{b=2}^5 Risk_{it} + \beta_3 \sum_{b=6}^8 control + \varepsilon_i \dots\dots\dots (3.1)$$

Where: PERF is the performance of bank i at time t

$\beta_0$  is a constant of regression

$CR_{it}$  is the concentration ratio

$Risk_{it}$  is the vector of risk variables

Control represents the control variables

$\varepsilon_{it}$  is the error term

$\beta_1, \beta_2$  &  $\beta_3$  are slope coefficients

ROA and ROE are the most important bank profitability ratios. The ROA is a measure of how efficient managers are in conversion of assets of the bank to net profit whereas ROE measures shareholders rate of return on investments.

$$PERF_{it} = \beta_0 + \beta_1 HHI_{it} + \beta_2 CapR_{it} + \beta_3 CrR_{it} + \beta_4 LqR_{it} + \beta_5 OvR_{it} + \varepsilon_{it} \dots\dots\dots (3.2)$$

Performance (PERF) will be the independent variable showing the banks performance. Most studies on bank performance have considered ROA and ROE as determinants of bank profitability. The ratio of net profits to total assets presents the ROA while the ratio of net profit to shareholders equity presents the ROE. ROE measures a banks' financial leverage or debt and is referred to as an equity multiplier of a bank. Therefore, banks that take a higher leverage, their ROE will rise above ROA. When analyzing ROE, risks associated with financial leverage are normally disregarded and the financial leverage is an indicator controlled through regulation, this makes ROA a preferred ratio for evaluation of bank performance Sundararajan et al., (2002). ROA is therefore, considered as an indicator of bank performance in our research.

The regression equation is therefore, written as:

$$ROA_{it} = \beta_0 + \beta_1 HHI_{it} + \beta_2 CapR_{it} + \beta_3 CrR_{it} + \beta_4 LqR_{it} + \beta_5 OvR_{it} + \beta_6 IFL_t + \beta_8 BS_{it} + \beta GDP_t + \epsilon_{it} \dots \dots \dots (3.3)$$

Where  $ROA_{it}$ , measures performance of bank i at time t and is a ratio of net income to total assets.

$HHI_{it}$  is the Herfindahl -Hirschman index showing market concentration of bank i at time t

$CapR_{it}$ ,  $CrR_{it}$ ,  $LqR_{it}$ , and  $OvR_{it}$  are specific variables for capital risk, credit risk, liquidity risk and overall risk.

BS is bank size

$INF_{it}$  is inflation level

GDP - gross domestic product showing the macroeconomic environment

$\epsilon_{it}$  is the random error term

### 3.3 Definition and Measurement of Variables

The response variable is the ROA, which is a proxy to performance of banks.

#### Performance index

Market concentration will be our major explanatory variable and will be measured using Herfindahl-Hirschman index. To calculate this ratio, we sum the market share squares of every

bank. HHI is interpreted by considering the general rule which states that if  $HHI < 0.1$  there is presence of low concentration, when  $HHI > 1.8$  this is high concentration and finally when  $0.1 < HHI < 1.8$  then there is presence of moderate concentration in the market.

### **Bank specific factors**

#### *Bank size*

The natural logarithm of banks' total assets will be a proxy to bank size. With difference in size, banks respond differently to economies of scale. This difference in response, as a result in difference in bank size, be taken care if in empirical analysis of bank profitability therefore; bank size will be employed as a control variable. Empirical studies have found bank size has a positive impact on bank performance (Garcia-Herrero et al., 2009; Chortareas et al., 2011).

#### *Capital Risk*

This is a ratio that will be used to evaluate the how equity affect the profitability in banks. To calculate this risk, a ratio of a banks' total equity to its total assets is considered. Higher equity to asset ratio in a bank indicates that it can withstand failure compared to those with lower equity to assets ratio (Zhang et al., 2013).

#### *Credit Risk*

The most common risk banks face in their daily operations is the credit risk. It helps to determine how non-performing loans (NPL) affect bank performance. Empirical studies reveal a negative association between credit risk bank performance. It normally shows that a bank suffers losses from unpaid loans with high ratio and lower losses in case of lower ratio and it is considered as a ratio of non-performing loans over net loans.

#### *Liquidity Risk*

This risk is used to measures the extent a bank can pay its liabilities when they arise. If this ratio is high, a bank has a lower risk of failing to pay its obligations when they are due (Zhang et al., 2013). Liquidity risk is computed as a ratio of total liabilities over total assets. Empirical results have revealed that liquidity risk and profitability are positively related since banks which are highly liquid are geared towards profitability (Chortareas et al., 2011).

### *Overall Risk*

This ratio shows how able a bank absorbs losses as result of non-performing loans before its capital is eroded. It is calculated as a ratio of loan reserve to NPLs. Banks with a lower ratio have a high risk of being bankrupt while those with a higher ratio have an ability to withstand losses from NPL.

### **Macroeconomic Variables**

#### *Gross Domestic Product*

To control for macroeconomic conditions, GDP growth rate is used. According to Flemini et al., (2009), during periods of recession, the quality of credit goes down and there are high chances of default. Therefore, bank profitability reduces.

#### *Inflation Level*

Changes in inflation rate have significant effects on profitability of banks. When inflation rate increases, firms and households' ability to pay loans decreases, this is due to stretched budgets hence increases in NPL levels.

**Table 3.1 Definitions and measurement of variables**

<b>Variable</b>	<b>Measure</b>	<b>Expected sign effect</b>	<b>Source</b>
ROA	Net profit/ total assets		CBK
Credit risk (CrR)	Nonperforming loans /net loans.	Negative	CBK
Capital risk (CapR)	Equity/assets ratio	Positive/Negative	CBK
Liquidity risk (LqR)	Total liabilities/total assets	Positive	CBK
Overall risk (OvR)	Loan loss reserve to NPLs	Positive	CBK
Bank size	The natural log of total assets	Positive	CBK

(BS)			
Market concentration (HHI)	Herfindahl-Hirschman index	Positive	CBK
Gross domestic product (GDP)	Annual GDP growth	Positive	WDI
Inflation (INF)	Annual change in consumer price index	Negative	KNBS

### 3.4 Econometric Approach

To determine how concentrated markets and risk absorption affect bank performance, the estimated model is:

$$PERF_{it} = C + \beta_1 \sum X_{it}^J + \beta_2 \sum X_{it}^L + \beta_3 \sum X_{it}^M + \varepsilon_i$$

Where:

$PERF_{it}$  is performance of bank  $i$  at time  $t$ ,  $C$  represent a constant of regression;  $Xs$  are the independent variables while  $\varepsilon_{it}$  is the error term.

$\varepsilon_i = v_i + \mu_i$  and captures the idiosyncratic error and unobserved bank effects respectively:

$$v_i \approx N(0, \sigma_v^2), \mu_i \approx N(0, \sigma_\mu^2)$$

In the estimation, the panel data method is applied, the Hausman tests will be applied to select which estimator to apply between the random effects and the fixed effects model. Diagnostic tests will also be conducted before performing the regression analysis. To determine if data used is homoscedastic, we run the Breusch-Pagan test, while to establish presence of autocorrelation, the Wooldridge test for serial autocorrelation in panel data is performed. Other tests include stationary and normality tests.

According to Bourke (1989), bank performance functional forms are qualitatively equivalent to linear and therefore the assumption of linearity is not binding. This study employs a panel data for Kenya commercial banks for nine years. 2010 - 2018 yearly data is used for this analysis.



This period is suitable in order to give better results since it is post the 2007- 2008 financial crisis and the aftermath of the 2007-2008 post-election violence, which slowed economic operations, and hampered bank performance in Kenya. Data for commercial banks is also readily available during this period.

### **3.5 Data Sources**

Data for this research is sourced from annual the annual statements of the banks financial position and income statement as reported to the central bank of Kenya for nine years starting from 2010-2018. GDP and inflation data will be drawn from Kenya national bureau of statistics database.

## CHAPTER FOUR

### EMPIRICAL FINDINGS

#### 4.0 Introduction

The empirical result for the study is presented in this chapter. It includes the descriptive statistics, correlation matrix and the fixed effect estimation results.

#### 4.1 Descriptive statistics

The results in the table below present the descriptive statistics. ROA had a mean of 2.6% for the period 2010 to 2018. This reveals that averagely banks in Kenya are profitable. The standard deviation of ROA is 2.45% showing small variability in ROA over time. The minimum ROA during the period was -9.8% while the maximum ROA was 7.7%. This reveals that whereas some commercial banks were performing well, there are other banks performing below average. A median of 2.66% indicates that most of the observations fall below the mean and only few observations fell above the mean.

**Table 4.1: Summary statistics**

Variable	ROA	HHI	Credit risk	Capital risk	Liquidity risk	Overall risk	Bank size	GDP growth	Inflation
N	333	333	333	333	333	333	333	333	333
Mean	0.0198	0.0649	0.1179	0.1609	0.8326	0.3938	24.28	5.8778	7.17
Median	0.02	0.066	0.08	0.16	0.84	0.4	23.98	21.4	6.35
SD	0.0304	0.0028	0.1357	0.0565	0.0575	0.1845	1.4752	1.033	2.89
Min	-0.24	0.058	0.01	-0.11	0.62	0.01	20.77	4.6	3.96
Max	0.08	0.67	1.34	0.38	1.11	0.9	35.55	8.4	14.02

The mean HHI was 6.49% showing that the market is relatively competitive. When the HHI is low, there is an increased level of competition. The credit risk had a mean of 1.179% while mean of capital risk was 1.609%. Liquidity risks had a mean of 8.4% and overall risk a mean of 3.938%. The standard deviation of credit risk was 1.357% while that of capital risk was 5.65%; this indicates the variables of the specific banks fell around the mean. The standard deviation of

liquidity risk was 5.75% and that of overall risk was 1.84% showing a low variability over the study period.

## 4.2 Correlation analysis

Bivariate correlation is relationship between data sets. Correlation analysis helps to determine if multicollinearity exist between the data sets. Multicollinearity problem arises if the correlation coefficients exceed 0.7, Kennedy, (2008).

Table 4.2 presents the correlation analysis, which we obtain through running a pairwise correlation test. The problem of multi-collinearity arises if regressors are highly correlated. The coefficient of standard errors is inflated hence affecting the predictors Gujarat, (2004).

ROA has a positive correlation with HHI, capital risk, overall risk, bank size, GDP growth rate and inflation. Banks with market power, those highly capitalized and those with a high ability to absorb losses due to NPL are profitable. As bank size also increase, profitability also improves. ROA has a negative correlation with credit risk. The negative correlation between performance of banks and credit risk indicates that profitability of banks decrease as the level of non-performing loans increase. Finally, ROA has negative correlation with liquidity risk. The negative correlation indicates that when the level of liquidity increase bank performance decreases.

**Table 4.2: Pairwise correlation matrix**

Variable	ROA	HHI	CrR	CpR	LqR	OrR	BS	GDP	INF
ROA	1								
HHI	0.0181	1							
CrR	-0.4171	0.1852	1						
CpR	0.1587	0.0349	-0.2083	1					
LqR	-0.1825	-0.0315	0.2240	-0.8649	1				
OrR	0.0704	-0.0859	-0.1780	0.0180	-0.0387	1			
BS	0.3869	0.0031	-0.1414	-0.2305	0.2421	0.1870	1		
GDP	0.1500	0.3983	-0.0226	-0.0337	-0.0136	0.0291	-0.1093	1	
INF	0.1109	-0.2968	-0.1752	-0.0718	0.0570	0.1043	-0.0739	-0.2668	1

### Hausman specification test

Table 4.3 presents the result from the Hausman test. The test result shows that the p-value is below 0.05. The alternative hypothesis is therefore accepted and we estimate a fixed effects model.

**Table 4.3: The Hausman specification test**

ROA	Notation	Coefficients		
		Fixed Effects (b)	Random Effects (B)	Difference (b-B)
Herfindahl-Hirschman Index	HHI	0.1591946	0.1183336	0.040861
Credit risk	CrR	-0.0504074	-0.0601881	0.0097807
Capital risk	CapR	0.101432	0.0575344	0.0438975
Liquidity risk	LqR	-0.1204886	-0.0914069	-0.0290817
Overall risk	OvR	-0.0005993	-0.0122645	0.0116651
Bank size	BS	0.0024977	0.008995	-0.0064973
GDP	GDP	0.0058832	0.0071028	-0.0012196
Inflation	INF	0.0017376	0.00199	-0.0002524

Chi-sq. =27.66, Prob. = 0.0005

### 4.3 Estimation results and discussion

In empirical analysis, the estimated equation should fit the model applied well for optimum result our estimated equation best fits the model. The result of our P value is below 5%, which leads to rejection of null hypothesis that our coefficients of the regressors are zero. To determine if the value of the residuals were homoscedastic, a diagnostic test for heteroscedasticity is performed. From the results, our model suffers the heteroscedasticity problem; the modified wald test for GroupWise heteroscedasticity for fixed effect model reported a p value below 5% therefore we rejected the null hypothesis that our data is homoscedastic. To correct for heteroscedasticity problem, our estimation applies robust standard errors.

The study findings reveal that concentrated markets have no significant effect when determining performance of banks. Therefore, market concentration is not important in determining bank performance. Concentrated markets do not translate to increase in profitability for Kenyan banks. Our findings contravenes the empirical work by Zhang et al.(2013) who found that concentrated markets had a positive effect on bank performance of BRICS banking sector.

We also found credit risk has a significant but negative effect on bank performance. When banks raise the level of their credit risk, there is a likelihood of failure. From this result, we confirm the finding of Zhang et al (2013) who also found that credit risk has a negative impact to bank performance of BRICS banks. We conclude that the bad luck hypothesis hold in the Kenyan banking system.

Capital risk is positive but insignificant in determining bank performance showing that profitable banks do not depend on equity to finance their operations. Our results indicate that reliance on equity financing does not translate to improved performance. Our results contravenes the work of Zhang et al.(2013) who found increase in equity positively affect performance of banks in BRICS market.

Our estimation results also indicate that liquidity risk has no significant effect on bank performance; it is therefore not influential when ascertaining bank profitability. This confirms the work of Ongore and Kusa (2013), who provides that liquidity management is only geared towards achieving obligations of depositors.

The result of the overall risk is insignificant and therefore does not contribute when ascertaining bank performance. This insignificant results postulate that overall risk does not influence the performance of banks in Kenya. This result asserts that overall risk does not matter when determining bank performance. We cannot confirm the work of Altunas et al., (2007) who found overall risk and bank efficiency with a positive and significant relationship.

The empirical results also provide that bank size does not have an impact on the performance of commercial banks. The coefficient of bank size is positive but insignificant at 5% level. This postulates that banking sector in Kenya lacks economies of scale. This insignificant result also indicates that a strategy to enhance growth may not be in favor of the interest of shareholders

confirming the agency theory of the firm. This results diverges from the work of Kamau and were (2013) whose' finding reveal that bank size affects profitability positively.

Our result also reveals that GDP has positive impact on bank performance. This means that when the economy grows the general income levels increase leading to increase in profitability. Growth in GDP drives growth in loans and deposits this in turn contributes to bank performance. Our result is consistent with Pervan et al., (2015), but it is inconsistent with that of Tan and Floros (2012) as theirs found GDP negatively affect bank performance.

Finally, inflation reveals a positive effect on bank performance. Inflation anticipation, leads to adjustment of interest rates accordingly therefore interest revenue to interest expense spread rise leading to increase in profitability. His confirms the work of Guru et al., (2012) who found similar results.

**Table 4.4: Fixed effects estimation results**

Variable	Coefficient	Std. Err.	t –statistic	Prob.
Constant	-0.0080191	0.0687667	-0.12	0.908
HHI	0.1591946	0.649374	0.25	0.808
Credit risk	-0.0504074	0.0095311	-5.29	0.000
Capital risk	0.101432	0 .0930018	1.09	0.283
Liquidity risk	-0.1204886	0 .0845886	-1.42	0.163
Overall risk	-0.0005993	0 .0153821	-0.04	0.969
Bank size	0.0024977	0 .0019956	1.25	0.219
GDP growth rate	0. 0058832	0 .0019227	3.06	0.004
Inflation	0.0017376	0 .0005186	3.35	0.002

## CHAPTER FIVE

### CONCLUSION

#### 5.1 Introduction

This research investigates how concentrated markets and risk taking can affect bank profitability in Kenya. This study uses the fixed effect model in analyzing panel data for a period of nine years using the banks data. We use ROA as a response variable while HHI, risk factors, macroeconomic determinants and bank size are the independent variables.

#### 5.2 Summary of key findings

Our estimation result points out that market concentration does not matter in determining bank performance in Kenya. This result diverges from the concept of structure- conduct- performance hypothesis. For credit risk, there is a negative influence on bank performance. Therefore, banks should reduce their credit risk in-order to remain profitable.

Capital risk is positive not significant to determine performance of bank performance. Capitalization in banks therefore, does not matter in determining bank performance in Kenya. This is also similar with liquidity risk. It does not contribute to bank performance in Kenya. Interpretation to this may be that the banking system in Kenya may not be having resources enough to meet liquidity standards of a developed banking system. Overall risk is not significant in relation to determination of bank performance as shown from the estimation result; its coefficient is positive but insignificant.

Empirical result also reveals an insignificant relationship between bank size and performance while GDP growth has a significant and positive effect. When there is an improvement in the economy there is a general increase in income levels leading to improvement in bank performance.

Finally, inflation is positive and significant in determining bank performance. This indicates that bank income increase more over bank costs with inflation. Bank customers may fail to predict inflation in future as compared to banks, leaving banks to earn more profits from this asymmetric information.

### **5.3 Conclusion**

Based on the research finding, we have revealed that market concentration, capital risk, liquidity risk, overall risk together with bank size are insignificant in explaining bank performance. We have also ascertained that credit risk is negative but statistically significant in explaining bank performance hence, a comprehensive credit risk mitigating policy should be in place. Finally, GDP and inflation have a significant positive relationship with bank performance in Kenya.

### **5.4 Policy implications**

From the research results of this study, we draw policy recommendations to policy makers and bank management. To bank management, they should lay more emphasis to credit risk management. This is because credit risk has a negative effect on bank performance. They should be able to recognize the non-performing loans to enable them create reserves which will be used to write-off these loans. To assist in mitigating this, there should be enhanced transparency in the financial system. This will enable banks to effectively evaluate credit risk to avoid failure as a result of hazardous exposure.

Banks should also not pursue growth strategies since bank size is not significant in determining bank performance. There is no evidence of economies of scale to support increased performance due to increased growth.

To CBK and the National treasury, since market concentration not significant in determining bank performance, there should be stringent guidelines to discourage mergers and acquisitions, but instead encourage diversification and offering of quality services hence improving bank performance.

The national treasury and CBK should also come up with policies, which enhance macroeconomic stability and GDP growth. GDP growth affects various elements in the economy, which directly link to the demand for and supply of loan leading to improved bank performance while monetary policies of price stability enhance reduction of household liquidity and therefore the risk of default decrease, which in turn improves bank performance.

### **5.5 Areas for further research**

For improvement on this analysis, the researchers suggest further studies on the topic by focusing on other financial organizations such as savings and credit cooperatives (SACCOs) and



microfinance institutions. There can also be extension of the study by focusing on other risk factors such as market risk. Bank size, can also be considered as total deposits or the size of credit for future studies on the topic instead of total assets.

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