

THE DETERMINANTS OF BANK PROFITABILITY IN ZAMBIA

By

Naminda Momba

A dissertation submitted to the University of Zambia in fulfilment of the requirements for
the degree of Master of Arts in Economics

The University of Zambia
Lusaka
2019

COPYRIGHT

No part of this dissertation may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, mechanical, photocopy, recovery or otherwise without prior written permission from the author or the University of Zambia.

DECLARATION

I declare that the “The Determinants of Bank Profitability in Zambia” is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Full name: Naminda Momba

Signed :.....

Date :.....

APPROVAL

This dissertation of Naminda Momba has been approved as fulfilling the requirements for the award of Master of Arts in Economics by the University of Zambia.

Examiner 1.....Signature Date.....

Examiner 2.....Signature Date.....

Examiner 3.....Signature Date

Chairperson of
Examiners Signature Date

Supervisor Signature Date

ABSTRACT

Commercial banks perform an important part in financial intermediation. Zambia, like any other nation, needs a stable banking system in order to finance private and public investments. The fruitfulness of the banking system in channelling funds from depositors to lenders is often gauged by examining bank profitability. Although the Zambian banking system continues to grow, the level of profitability remains low. This paper examines the determinants of the profitability of banks in Zambia during the period January 2010 to December 2016. The empirical analysis uses bank specific variables and employs a fixed effect model after carrying out a Hausman test. The study employs panel data of 17 commercial banks obtained from the Bank of Zambia. The measures of profitability used in the study are return on assets (ROA), return on equity (ROE) and net interest margin (NIM). In estimating the models, these measures of profitability were regressed on bank size as measured by the log of asset and on credit and liquidity risk measures and bank efficiency. Empirical findings show that bank size, the ratio of loan loss provision to total assets and total loans to assets significantly affect bank profitability regardless of the profitability measure employed. Results indicate that banks pay more to depositors than they receive from loans and that most of their profit is relatively derived from operational income rather than interest based income. Bank efficiency is observed to have a positive significant impact on NIM only. In light of these finding, it is recommended that banks develop a policy that limits the amount of loans they extend without collateral. This will allow commercial banks to reduce and mitigate the high risk of default observed in this study.

Keywords: Bank profitability, Panel data, Bank specific variables, Zambia.

DEDICATION

My Brothers Munakumbe Momba, Chilemena Momba and Mweetwa Momba and my parents.

ACKNOWLEDGEMENTS

I would like to thank my supervisor Dr C. Mphuka for the continued support rendered while doing the paper. I would also like to express my gratitude to Mr Bright Chizonde for his guidance in the building of the paper and the University of Zambia for according me the opportunity to be able to write the paper.

The study would not have been successful without the data from the Bank of Zambia, Bank Supervision Department as well as the Economics department for the help rendered.

TABLE OF CONTENTS

COPYRIGHT	ii
DECLARATION	iii
APPROVAL	iv
ABSTRACT	v
DEDICATION	vi
ACKNOWLEDGEMENTS	vii
TABLE OF CONTENTS	viii
LIST OF TABLES	xii
LIST OF FIGURES	xiii
ABBREVIATIONS	xiv

CHAPTER ONE 1

INTRODUCTION..... 1

1.1 Background of the study 1

1.2 Problem statement..... 3

1.3 Objectives of the study..... 6

1.4 Research questions..... 6

1.5 Significance of the study..... 7

1.6 Scope of the study 7

CHAPTER TWO 8

OVERVIEW OF BANKING IN ZAMBIA 8

2.1 Introduction..... 8

2.2 Financial Structure since 1964..... 8

2.3 Historical overview of banking in Zambia	10
2.4 Zambian banking sector structure	12
2.5 Profit and performance indicators	13
 CHAPTER THREE	 17
LITERATURE REVIEW	17
3.1 Introduction	17
3.2 Theoretical review	17
3.2.1 Capital Adequacy	17
3.2.2 Liquidity Risk	18
3.2.3 Credit risk	19
3.2.4 Bank size	19
3.2.5 Market Concentration	19
3.2.6 Conclusion	20
3.3 Empirical review	20
3.3.1 Studies on various countries	21
3.3.2 Studies on developed Countries	22
3.3.3 Studies on Developing Countries	23
3.4 Synthesis	26
 CHAPTER FOUR	 28
MODEL SPECIFICATION AND METHODOLOGY	28
4.1 Introduction	28
4.2 Research Methodology	28
4.2.1 Research Design	28

4.2.2 Target Population.....	28
4.2.3 Sample Size.....	28
4.3 Data Collection Techniques.....	28
4.4 Data Analysis	29
4.5 Research Model	29
4.5.1 Model Specification.....	29
4.5.2 Estimation Procedure	30
4.5. 3 Description of Variables	31
4.6 Limitations	33
 CHAPTER FIVE	 34
EMPIRICAL ANALYSIS.....	34
5.1 Introduction.....	34
5.2 Regression Analysis.....	34
5.3 Discussion of findings.....	35
5.4 Diagnostic tests.	39
5.4.1 Test for Multicollinearity	39
 CHAPTER SIX	 41
CONCLUSION AND RECOMMENDATIONS.....	41
6.1 Introduction.....	41
6.2 Conclusions.....	41
6.3 Recommendations.....	42
6.3 Recommendations for further Research.....	43

REFERENCES.....	44
APPENDICES.....	51

LIST OF TABLES

Table 1: Bank Liquidation dates and causes	11
Table 2: Ratings of Bank Performance and Condition	14
Table 3 Financial Performance Indicators	14
Table 4 Regression Analysis.....	35
Table 5 Test for Multicollinearity	40

LIST OF FIGURES

Figure 1: Return on Assets Trend	5
--	---

ABBREVIATIONS

BANKEFF-	Bank Efficiency
BANKSIZE-	Bank Size
BOZ -	Bank of Zambia
CAP -	Capital Ratio
CRDRISK1-	Credit Risk 1
CRDRISK2-	Credit Risk 2
EFCROE-	Efficiency in the Return on Equity
ES-	Efficiency Structure
FGLS-	Feasible Generalised least square
GDP-	Gross Domestic Product
GLS-	Generalised Least Square
HERF-	Herfindahl index of market concentration
LQRISK1-	Liquidity Risk 1
LQRISK2-	Liquidity Risk 2
LSDV-	Least Square Dummy Variable
MP-	Market Power
NIM-	Net interest Margin
OLS-	Ordinary Least Square
PLC-	Public Limited Company
PWC-	PricewaterhouseCoopers
ROA-	Return on Assets
ROE-	Return on Equity
SEE-	South Easter Europe

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Commercial banks play a vital role in the economic resource allocation of countries. They act as financial intermediaries reallocating resources from those with excess (savers) to those who require it (borrowers). It pools resources thus allowing a flow of funds from surplus units to deficit units at a lower transaction cost. Based on the most lucrative investments, the bank is able to allocate resources to investments with higher returns. This allows for those with investment opportunities to access funds which they otherwise wouldn't be able to get. Thus banks enable increased economic activity by promoting investment that brings about economic growth (Mishkin, 2004).

Commercial banks are, however, not charitable or public organisations in most cases and thus their aim is to make profits. This is primarily done by charging a higher interest rate on the borrower relative to the interest rate given to the saver. For any firm to continue to function in the long-run, it has to at least make normal profits. This profit can be used to increase the volume of the business through the expansion and portfolio diversification, which is necessary for further development. It enables the business to grow, helps employee motivation, attracts investors and most importantly gives the clients/customers confidence in the business which ensures a successful business. A business is also subject to many risks, uncertainties, increasing competition, changes in the government policies, and so profits are used to ensure the business continues even in unfavourable conditions. Generally, profitability of commercial banks has been linked to long term survivability as agreed by Maverick (2015). Beyond the intermediation function, the financial performance of banks also has implications on the economic growth of countries. Good financial performance rewards the shareholders for their investment and this, in turn, encourages additional investment which brings about economic growth. On the other hand, poor banking performance can lead to banking failure and crisis which have negative consequences on economic growth (Albertazzi & Gambacorta, 2009).

Profitability of banks can be measured in several ways. The most common measures of profit include return of assets (ROA), return on equity (ROE) and net interest margin

(NIM). ROA is the most basic measure of profit computed as net profit after taxes divided by the total assets. This indicates how efficient the bank is as it gives information on how much profit is made on each unit of the assets as opposed to general profit (income less expenses). ROE is computed by dividing the net profit after taxes with the total equity capital. Since assets are equal to the summation of total equity and liabilities, (therefore equity is less than assets), which implies that ROE is higher than ROA. ROE is of greater interest to shareholders as it indicates how much profit is made per unit of bank capital or their investment. Thus ROA measures how efficiently the bank is run whilst ROE measures how well bank equity investments are performing. NIM is computed by dividing the difference between interest income and interest expenses on total assets. A high NIM implies the bank is able to acquire assets with a high interest income and/or obtain liabilities at a low interest cost. However, interest rate margin may be affected by external forces thus ROA may be more relevant in showing internal bank efficiency.

Studying the determinants of profitability of banks has been of increasing interests as financial inclusion and innovation has grown worldwide. It has also gained more importance after the global financial crisis as this was in a huge part caused by the collapse of commercial banks. Thus, establishing the factors that increase a bank's profitability, which will ensure it is shielded from collapse, cannot be over emphasized (Iacobelli, 2017). For developing countries, though financial inclusion may be low (about 30% in Southern African Development Community SADC by 2014 (European Investment Bank, 2015)), in Zambia, the banking sector makes up 80% of the financial intermediaries (European Investment Bank, 2015) thus the banking sector plays a huge role in financial intermediation. Therefore increased profitability of banks directly implies increased investment through intermediation, growth in the real sector and essentially economic growth. Increased profits also entail increased expansion of the financial sector which directly contributes to Gross Domestic Product. Furthermore, the sector employs a number of people which increases aggregate expenditure and thus Gross Domestic Product (GDP). Financial statistics records a total number of 7999 employees as at 2015 end-of-year (Bank of Zambia, 2015). As seen in Mauritius and Namibia, the growth of financial services can contribute significantly to GDP growth; 23% in Seychelles and 21% in Mauritius whilst Zambia is at about 12%.

The Zambian banking sector has made significant progress from the time the country gained its independence in 1964. With only three commercial banks(all foreign sub diaries) at the time, the sector now has 17 commercial banks with nine of these privately owned by Zambian citizens/organisations or Government owned. The sector has however faced a number of challenges with about ten commercial banks being liquidated between 1995 and 2003. This was mainly due to liquidity problems and inadequate capital. This encouraged the regulatory authorities to put in heavier requirements on capital adequacy, statutory reserves and liquidity insurance to ensure no banks became insolvent. This has since resulted in less bank closures and increased profitability and efficiency (Bank of Zambia, 2014). The sector, however, still remains with significant challenges, i.e. cost management, credit risk, liquidity risk, interest rate risk and cyber security (Price Waterhouse Coopers, 2016).

As observed during the 2008 global financial crisis, the failure of banks can adversely affect economic growth of the real sector. This has increased research on the factors that affect bank profits to ensure banks are provided with information that will build internal shields against changing market trends. Though research for developed countries is wide-ranging, little is available in developing countries. The purpose of this study is therefore to recognize the vital determinants that affect the profitability of the public and private commercial banks in Zambia over the period 2010 to 2016. The determinants of bank profitability in literature can be divided into bank-specific factors, industry-specific factors and macro-economic factors. This study will focus on bank-specific factors as they have been observed to have the most significant influences on bank profitability in past empirical researches.

1.2 Problem statement

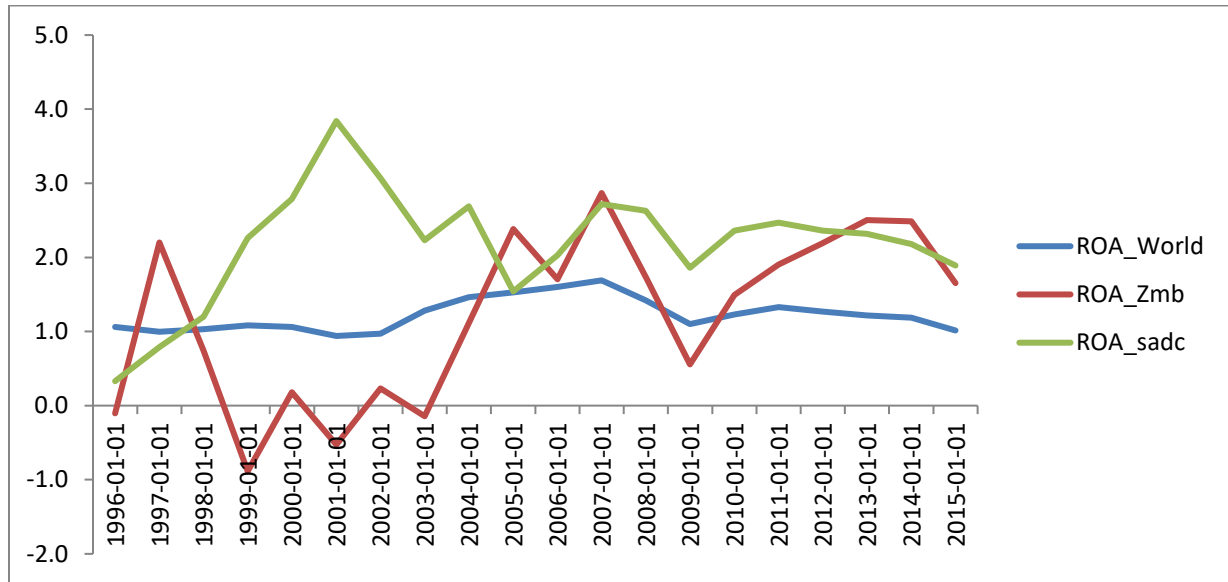
Profitability is the basic aim of establishing a business and banks are no exception. As profitability is an important factor for the smooth running of any business in today's competitive setting it has a significant impact on the performance of the institutions. The financial proficiency of banks can also influence economic development. Therefore, it is crucial to know how far a bank, in its own capacity, is able to increase its

profit by increasing its efficiency so as to avoid macroeconomic effects that may have other multiplier effects.

The Zambian banking sector has been characterised by a lot of fluctuations when it comes to profits. At independence, the country only had a few banks all of which were run by foreign subsidiaries. In an effort to serve the local population, Government owned banks were introduced and stiff regulations put on licensing of private commercial banks. Thus the market continued to be oligopolistic ensuring profits were attained. However, 70% of assets were owned by foreign banks and so they dominated the banking industry. After 1991, the financial sector was liberalised allowing private banks to enter the market. This increased competition but poor regulation led to many of these banks being liquidated (Sandi, 2010).

By 1996, when the liquidation trend began, the average ROA for Zambia was negative. The ROA continued to improve as the Bank of Zambia stiffened regulations on Banks also improving economic growth and the financial sectors contribution to GDP. ROA reached its peak in 2005 when it was recorded at 6% whilst ROE was at 52.8%. There has however been a fall in profitability since 2005. The lowest ROA was recorded in 2009 at 2% and was attributed to the global financial crisis which, unlike other countries, did not severely affect the Zambian economic growth rate (Bank of Zambia, 2006). However, the ROA has not recovered well after the financial crises despite the same regulatory factors surrounding the banking industry. The profitability of the Zambian sector remains below the average of the Southern African Development Community (SADC) bank profitability (European Investment Bank, 2015). Since the conditions that helped the sector thrive in the early 2000s remain, establishing other internal factors that may help the sector grow at least to the SADC average is imperative.

Figure 1: Return on Assets Trend



Source: Authors own computations

Figure 1 shows trends in profitability for the Zambian economy, SADC regional group and the world at large. As can be seen, Zambia has performed generally well relative to the world average apart from the late 1990s when the sector was faced with numerous challenges. The sector however remains below the SADC average. In 2005 and 2014, the Zambian sector performed better than the SADC average showing its potential to thrive. Thus the sector needs more investment to be able to reach and exceed its potential.

Additionally, Bank of Zambia (2016) indicates that eight out of 19 banks recorded losses in 2014 and this number increased to nine in 2015, but it however reduced to five banks at the end 2016. Of the 19 commercial banks one was not operating by December 2016 following the possession of Intermarket Banking Corporation Zambia Limited by the Bank of Zambia on 29 November 2016. This was attributed to the slowed economic activity recorded in 2015 (3.2% from 5% in 2014) and 2016 due to falling copper prices. It can be observed that the commercial banks' profits are usually affected by external factors showing the commercial banks' emergent need to build internal structures that will enable adaptability to changing macroeconomic environments.

Based on the authors' knowledge, no study has been done in Zambia to determine bank-specific factors that determine bank profitability. However, PWC (2017) in their banking survey were able to establish some key challenges facing the banking sector today. These include; Credit risk (due to increase in non-performing loans), liquidity risk (due to increased regulation), cyber security (due to poor technology), cost management (due to increased prices) and interest rate risk (due to increased policy rate). Several empirical studies find these variables to be cardinal in determining bank profitability. Aremu (2013) found liquidity to negatively affect profitability whilst Mohammad et al (2015) found it to positively affect profits. Other authors go further to suggest a non-monotonic relationship may exist between liquidity and profits (Eichengreen & Gibson, 2001). These discrepancies further warrant the need to determine the factors affecting bank profits in Zambia.

This study therefore estimates bank-specific factors affecting commercial bank profits in Zambia. It focuses on the period 2010 to 2016 when there were fewer bank closures. Thus a panel data analysis of 17 commercial banks existing in that period is carried out.

1.3 Objectives of the study

The main objective of the study is to identify the key factors that determine bank profits in Zambia. The specific objectives are:

- i. To determine the relationship between the size of the bank and bank profits.
- ii. To determine the relationship between credit risk and bank profit.
- iii. To determine the relationship between liquidity risk and bank profits.
- iv. To determine the relationship between capital ratio and bank profits.

1.4 Research questions

Some of the questions to be addressed in this study include:

- i. To what extent does bank size affect Bank profits?
- ii. What is the effect of liquidity and credit risk on bank profits?

- iii. What is the relationship between capital ratio and bank profits?
- iv. How do bank-specific factors affect different measures of profit?

1.5 Significance of the study

There is limited number of empirical studies on bank profitability in Zambia despite the fact that keeping banks afloat must be a primary concern of the country. A highly efficient banking system entails a reliable pool of funds for small scale business, medium enterprises, the government projects and households that pave the way for economic growth. Therefore identifying profit determinants provides an opportunity for management to know which variables influence banks' profit so that they can focus their attention on those determinants when making decisions. The results of this study will therefore be used to provide appropriate advice to the Bank of Zambia for prudent financial regulation and commercial banks in their efforts to improve the bank performance and build capacity to survive negative macroeconomic conditions.

1.6 Scope of the study

This study is confined to the period from 2010 to 2016. For the purpose of data manipulation the data was specific to the periods 2010 to 2016. However, references are made to other dates outside this scope using Bank of Zambia reports.

CHAPTER TWO

OVERVIEW OF BANKING IN ZAMBIA

2.1 Introduction

This section contextualizes the study by outlining the Zambian banking sector and its developments since attaining independence in 1964. The section will begin with a brief history of the financial sector and then zero in on developments in the banking sector. The structure of the banking sector and its performance will then be given.

2.2 Financial Structure since 1964

The Zambian financial sector has undergone various changes since attaining independence in 1964. At the time of independence, only 3 commercial banks existed all of which were foreign owned. With the government intending to address the needs of the citizens, state-owned banks were established after failed attempts to nationalize the foreign owned banks. In the 1970s, the financial sector had grown considerably with a number of commercial banks and non-bank financial institutions (NBFI) such as Credit Guarantee Schemes, Building societies, Insurance Firms and Pension scheme companies. These institutions primary aim was to enable the citizens access credit particularly the farmers and small scale industries. The financial sector was characterized by financial repressive policies such as fixed interest and exchange rates, controlled credit allocation and price controls. The economy was heavily controlled by government with several restrictions on the licensing of financial institutions. The financial policy after independence was generally nationalization of foreign owned institutions, development of more financial institutions and administrative controls over interest rates and loan allocation (Sandi, 2010).

The financial restrictions did not however bring desired results in the financial sector. In the 1970s, deposit interest rates averaged five percent and lending rates averaged 10% whilst inflation rates averaged 10% implying almost zero real interest rate. The late 1970s were characterized by falling copper prices, copper being Zambia's main export and major source of foreign exchange, leading to increased inflation rates. The restrictions on

financial markets exacerbated the decline in economic performance as the government had to put up measures i.e. borrowing to ensure controlled interest and exchange rates. As the situation worsened, the government implemented a stabilization policy in 1984 that allowed for a small rise in interest rates and eventually the decontrol of interest rates later that year. The real interest rates were then negative with lending rates shooting above 30%. There was also a fall in credit allocated to the private sector, consistent Balance of Payments (BOP) deficits, and increased inefficiencies in payment systems. Given the declining macroeconomic environment, the decontrol of interest rates caused them to shoot upwards. This led to public outcry and consequently the reinstatement interest rate controls in 1987. With the economic situation worsening as inflation rates spiralled, the interest rates were raised in 1989 but the rise did not reflect the declining financial status. With growing discontent among the locals, a new government was voted in in 1991 which fully liberalized the financial sector (Brownbridge & Harvey, 1998).

In 1991, the new government fully embraced the International Monetary Funds' (IMF) Structural Adjustment Policies (SAPs) which required full liberalization of the financial sector. Interest rates were liberalized in 1992 and exchange rates in 1993 leaving them to be completely market determined. This led to a further rise in the inflation rate, reaching an all-time peak of 191% in 1992. However, with the many other adjustments i.e. privatization, decontrol on prices, fiscal prudence, the economy began to recover in 1994. The nationalism policy was also abolished and a free market economy adopted which saw an increase in the private sector. The Central Bank also aimed to remove obstacles in the financial sector so as to encourage competition and efficiency. This saw the establishment of several private owned and foreign owned financial institutions in the early 1990s and early 2000s (Banda, 2010).

The financial sector has since remained liberalised and continued to grow. It currently comprises of 17 commercial banks and several non-bank financial institutions which include eight Leasing Finance Institutions, four Building Societies, 73 Bureau de Change, one Savings and Credit Institution, 34 Microfinance Institutions, one Development Finance Institution and one Credit Reference Bureaux. The Bank of Zambia (BOZ) regulates commercial banks and NBFIs licensed by BOZ. The Pensions and Insurance Authority

(PIA), Securities and Exchange Commission (SEC) and Lusaka Stock Exchange (LUSE) regulate the insurance firms, capital markets and stock market respectively (Bank of Zambia, 2017).

2.3 Historical overview of banking in Zambia

Prior to independence, 3 Commercial Banks existed in Zambia. The first was Standard Chartered bank which was established in 1906, the second was the Barclays Bank established in 1918 and the third was the Grindlays Bank which was established in 1956. The sole purpose of these banks was to serve the interests of the mining sector and foreigners living in Zambia. The majority of the local people had little to no access of loans or other available financial services (BrownBridge & Harvey, 1998).

After independence, Zambia had its first economic reforms in 1968 where it was decided that all foreign banks be nationalised so that they could serve the local population. Unfortunately, the government failed to nationalise any of the banks as they threatened to withdraw their expatriate management which the country lacked (Brownbridge & Gayi, 1999). Therefore, the government established its own bank called the Zambia National Commercial Bank (ZANACO) to serve local needs. A new Banking Act was also enacted in 1965 replacing the 1959 Act. The new Act however did not change much of the contents of the previous Act but only reflected a new government perspective. In 1972, another Banking Act was enacted to replace the 1965 Act. This new Act reflected the new nationalism policy adopted by the government at the time. The Act allowed for increased government influence in commercial banks' activities and regulation. Several other institutions were established thereafter i.e. Cooperative Bank, Zambia National Building Society, Lima Bank, National Savings and Credit Bank etc. leading to reduced monopoly in the market (Mushota, 2002). The Banking Act of 1994 was slightly amended in 2000 to include other upcoming financial institutions i.e. Microfinance institutions.

After liberalisation of the financial sector in 1992, a new Banking Act was introduced in 1994 that allowed for more independence and proper regulation of commercial banks. The Act requires that banks have sufficient capital, competent management, run a profitable business, prudent financial history and serve the local needs. The roles and activities of

commercial banks are also stipulated in this Act to prevent fraud and mismanagement. Most importantly, the Act gave the BOZ authority to issue prudential directives such as capital adequacy essentially allowing them to be the official regulatory body over commercial banks unlike prior to the Act when government exercised most control. The 1996 BOZ Act also changed the Central Banks' mandate to formulating and implementing monetary policy that ensures price stability and financial systems stability. This essentially changed BOZs position from merely ensuring compliance to regulation of financial sector (Chiumya, 2004).

Unfortunately after this Act, many commercial banks collapsed due to various reasons. It was however mainly due to the influx of commercial banks after 1991 as the private sector boomed. By 1994, the country had 18 commercial banks from 10 in 1990. The licensing criteria for entry of these banks was not explicit and thus most were either unable to run efficiently or were deregistered for failure to comply with the Act. Below is a list of commercial banks with liquidation dates and few reasons why they failed.

Table 1: Bank Liquidation dates and causes

Name of Bank	Liquidation Date	Few causes of Liquidation
Meridien BAIIO Bank	19 May, 1995	Insider trading, poor credit management, high expenses, failure to recapitalize
Africa Commercial Bank	13 th November, 1995	Non-performing loans, low liquidity, failure to recapitalize, insider trading, no depositor insurance.
Commerce Bank	29 th November, 1995	High default on loans, failure to recapitalize, non-performing loans.
Zambia Export and Import Exim	19 th February, 1997	Failure to recapitalize.
Prudence	18 th October, 1997	Failure to recapitalize, heavy external borrowing, poor management,
Credit Africa Bank	28 th November, 1997	High number of outstanding loans, low depositor security, fraudulent transactions.

Manifold Investment Bank	4 th December, 1997	Liquidity problems, failure to meet capital requirements, low deposit security.
First Merchant Bank	2 nd February, 1998	Poor depositor security, Adverse Press reports, failure to meet obligations.
Union Bank	13 th February, 2001	Non-performing loans, insider trading, failure to meet capital obligations.
United Bank of Zambia	24 th May, 2006	Failure to recapitalize.
Intermarket Banking Corporation	29 th November, 2016	Reposessed by the BOZ due to financing problems.

Source: Bank of Zambia Annual Reports

From the table above, it can be observed that most banks were liquidated for similar reasons. With the BOZ taking its regulatory role, the capital requirements and deposit insurance were revised upwards to protect the depositors and reduce liquidity risk. Most banks were unable to meet these obligations particularly because most had been established without these restrictions and others were involved in fraudulent activities. The poor economic stance at the time also increased the number of non-performing loans making it difficult for most banks to continue running (Mushota, 2002). The situation has since improved with many commercial banks now adhering to the regulations set by BOZ. However most locals have increased preference for foreign banks relative to local ones as only one foreign bank has been liquidated (Sandi, 2010).

2.4 Zambian banking sector structure

The Banking Sector is governed by the Banking and Financial Services Act (BFSA) of 1994 which gives the BOZ the mandate to regulate commercial banks and other financial services. The licensed banks are represented by an organisation called Bankers Association of Zambia (BAZ) representing the banks' interests. There are currently 17 commercial banks operating in Zambia where eight are subsidiaries of foreign banks, seven are locally owned private banks and two partially government owned. Subsidiaries of foreign banks imply banks that are locally incorporated by are subsidiaries of foreign banks whilst locally owned private banks imply banks with at least 51% equity shares are owned by a Zambian citizen or entities incorporated in Zambia. There are also two banks created by an Act of

parliament and thus outside the financial system regulatory system. These are the Development Bank of Zambia (DBZ) and National Savings and Credit Bank (NATSAVE) (Bank of Zambia, 2017).

Foreign subsidiaries have largest share of the market based on total assets, loans, deposits and profitability. They are followed by banks partly owned by government. As at end of 2016, foreign subsidiaries had 70.8% of assets, 68.1 of loans, 70.4% of deposits and a profit share of 97.2% with government owned banks taking 8.9% and local banks, -6.1%. From this we can see that the foreign owned banks have continued to perform far better than local banks and hence attract more customers. The foreign subsidiaries also possess majority of the bank branches in the country i.e. 60% of total bank branches in 2016 most of which are located in Lusaka and the Copperbelt (Bank of Zambia, 2017).

Generally the commercial banks assets are composed of mainly net loans and advances, taking up about 40% of total assets. This is followed by balances with foreign financial institutions and Bank of Zambia which are each average 17% of total assets. Investments in government securities take about 15% and others about 13%. The liabilities structure has deposits accounting for the largest share; 83% on average. In 2016, Demand deposits made up 66.7% of deposits followed by time deposits which accounted for 23.8% and savings deposits that accounted for 9.5%. Other liabilities include balances to financial institutions abroad; 6% and balances due to financial institutions in Zambia; 1.2% (Bank of Zambia).

2.5 Profit and performance indicators

Commercial banks have continued to perform satisfactory in that all are able to meet the minimum requirements set by the BOZ. On 2 January, 2014, the BOZ revised the capital requirements upwards from a minimum of k12million to k108 million for local banks and k520 for foreign banks with at least 80% in form of paid-up common shares. This saw the shift of 6 of the foreign banks to local privately owned banks (Bank of Zambia, 2014).

The performance of banks is generally measured by its capital adequacy, liquidity, asset quality, earnings and risk absorbing ability. As at 2016, only one bank was noted to fail to

meet the minimum requirements, a reduction from two in 2015. The table below shows the ratings of bank performance and condition.

Table 2: Ratings of Bank Performance and Condition

Performance Rating	Capital adequacy				Asset Quality				Earnings				Liquidity			
	Dec-13	Dec-14	Dec-15	Dec-16	Dec-13	Dec-14	Dec-15	Dec-16	Dec-13	Dec-14	Dec-15	Dec-16	Dec-13	Dec-14	Dec-15	Dec-16
Satisfactory	18	15	14	11	12	11	11	8	10	8	7	7	9	8	10	14
Fair	0	0	2	3	4	3	1	4	2	4	5	6	8	9	6	2
Marginal	0	0	0	1	2	4	5	4	4	4	5	3	1	1	2	1
Unsatisfactory	1	4	3	3	1	1	2	3	3	3	2	2	1	1	1	1
Total	19	19	19	18	19	19	19	18	19	19	19	18	19	19	19	18

Source; Bank of Zambia Annual Reports (2015 & 2016)

Table 3 Financial Performance Indicators

Indicator	Dec-2010	Dec-2011	Dec-2012	Dec-2013	Dec-2014	Dec-2015
Primary capital adequacy ratio	19.1	16.8	19.4	24.5	24.6	19.2
Total regulatory capital adequacy ratio	22.1	19.2	21.3	26.8	27.0	21.2
Net non-performing loans to regulatory capital	11.2	10.2	8.7	3.5	4.3	7.2
Gross non-performing loans to total loans	14.8	10.4	8.1	7.0	6.1	7.3
Net non-performing loans to total loans	2.9	2.4	2.1	1.1	1.4	2.2
Provisions to non-performing loans	80.3	76.7	73.5	83.2	90.2	67.9
Non-interest expenses to total assets	8.6	7.4	7.3	6.9	7.0	6.7
Provision for loans losses to total assets	1.1	0.1	0.4	0.5	0.4	0.5
Net interest income to total assets	6.4	6.1	6.1	6.1	6.3	5.5
Net interest Margin	9.0	8.1	8.4	8.3	8.5	8.2
Return on assets	2.5	3.7	8.9	3.4	3.7	2.8
Return on Equity	12.1	25.5	20.8	18.2	17.3	13.1
Efficiency ratio	71.8	68.1	65.5	66.0	64.6	69.2
Liquid assets to total assets	43.7	40.3	48.6	38.9	35.8	34.8
Liquid assets to deposit and short term liabilities	52.3	48.6	44.4	49.3	45.7	42.7

Source: Bank of Zambia Annual Report (2013) and (2016)

From Table 2 above, it can be observed that banks have continued to perform well as the number of banks unable to meet requirements continued to drop except with respect to asset quality where number has increased to three in 2016 from one in 2013. This is attributed to the increase in non-performing loans as can be seen in table 3 caused by fall

in economic activity in 2015 and 2016. However, since the revision of the capital requirements upwards; banks have been able to meet the minimum required amount indicating a good capital covering and lower risk position (Bank of Zambia, 2017).

The capital adequacy of the banks has improved over the past decade. The minimum capital ratio is at 5% and 10% respectively and as shown in the tables above, the ratio has been way above the minimum in the recent past indicating a good capital position. According to a survey by PWC (2017) capital adequacy is not seen to be an issue of concern in the Zambian banking sector.

The asset quality of the banks looks at the risk and return of assets acquired by the banks. Thus it is usually measured by the ratio of non-performing loans (non-performing loans to total loans) in 2016, an increase in this ration was observed from 6.1% in 2014 to 9.7% in 2016. This came very close to the benchmark of 10% and has been attributed to the prevailing high interest rates. The agriculture, forestry, fishing and hunting industry accounts for the largest proportion of these non-performing loans. The ability to absorb these losses is also cardinal for bank performance. Overall, this ability continues to rise with the ratio being at 70% in 2016 from 60% in 2012. This indicates an increased risk management position from the banking sector (Bank of Zambia, 2017)

Liquidity risk is seen to be one of the major issues in the banking sector. Though improvements have been observed, banks still have challenges ensuring they are liquid due to high policy rates and statutory reserve ratios which is one of the highest in Southern Africa. In 2016, the liquidity market started out with K711 billion increasing to K 2,207 billion in March, 2016 then falling to k 668 in July, 2016 (PWC, 2017). According to the PWC (2017) survey, five of the top six banks were said to have liquidity risk despite meeting the minimum requirement.

Earning (profits) by commercial banks have generally been declining since 2013. There were only 10 banks in the satisfactory region in 2013, and the number reduced to seven in 2016 as can be seen in Table 2. The Return on Equity (ROE) on average for banks fell in 2016 just as in other industries. However, the ROE in foreign banks actually rose from 17% in 2015 to 23% in 2016 whilst in other banks it was negative. The Net interest Margin

(NIM) also fell for all the banks in 2016 to an average of 60% from 64% in 2015. The Net Profit Margin (NPM) also fell recording a negative result in local banks. Thus generally, the profitability of Banks has declined with foreign banks doing much better than locally owned banks (PWC, 2017).

CHAPTER THREE

LITERATURE REVIEW

3.1 Introduction

This chapter reviews theoretical and empirical literature on the determinants of commercial bank profitability. The first section looks at the various theories proposed on variables that affect bank profitability and how profits are affected by these variables. The second section reviews empirical studies done in developed and developing countries on variables that affect commercial banks' profits using different measures of profit.

3.2 Theoretical review

This section gives the theoretical expectations of various factors' effect on a commercial banks' profitability. The factors that affect banks profitability can be split into internal and external factors. An internal factor generally refers to a variable that arise from management decisions and policy objectives whilst external factors are those that are outside the control of the banks' management. This research paper focuses on internal factors which include variables such as bank size, credit risk, capital adequacy, liquidity risk and market concentration. (Aremu, Imon, & Mustapha, 2013).

Profit is basically defined as the difference between total revenue and total costs. Thus profit will generally increase as when there is an increase in revenue or decrease in cost of production. In the case of banks, increases revenue may imply an increased value of assets, higher return assets, increase access to credit for investment (deposits) etc. Reduced costs may be as a result of fall in non-performing loans, economies of scale, lower expenses and lower reserve ratios. This provides a general picture of how balance sheet items are expected to affect the bank's profitability. The theories below detail how the internal factors will affect the profits earned by banks.

3.2.1 Capital Adequacy

The relationship between capital adequacy and profitability has been suggested to be non-linear by some researchers (Sufian & Chong, 2008) as it has been observed to be ambiguous. An increase in capital adequacy occurs when banks are mandated to increase

the capital maintained so as to reduce risk. This is said to have a negative impact on earnings since this means a lower return on the banks capital as money which could be used to earn more profits is kept away. According to the Modigliani-Miller theorem there exists no relation between capital structure (debt or equity financing) and the market value of banking. In this context there is no relationship that exists between the equity-to-asset ratio and funding costs or profitability. However information asymmetry and transaction costs distort money market's perfect market. Therefore when the perfect market does not hold there could be a possible explanation for a negative relationship between capital structure and profitability (Modigliani & Miller, 1958).

On the other hand, the signalling hypothesis can serve to explain the positive relationship between capital ratio and earnings. Here, the symmetric information assumption is relaxed, allowing managers to have private information about the future stream of cash flows. Therefore, managers might be willing to signal this information through capital decisions (Myers and Majluf, 1984). As a result, a signalling equilibrium may exist; in which banks that expect to have improved future performance have higher capital. Empirical studies like Iacobelli (2017) find a positive relationship between profitability.

Some authors argue that this effect is short term since in the long run banks take on more risky assets or better quality assets which increase their earnings when they know a high capital is available to cushion their activities and reduce cost of bankruptcy (Iacobelli, 2017). Thus capital adequacy can be said to have a negative effect on earnings but this effect may be positive at higher levels of capital. Empirical studies like Khizer (2011) find higher capital to reduce profitability.

3.2.2 Liquidity Risk

Liquidity refers to the ease of selling a financial asset for cash (Mishkin, 2004). The bank requires liquid assets to meet daily expenses and depositors' withdrawals. Liquidity risk therefore arises from inability of the bank to accommodate decreases in liabilities. A strong negative relationship is thus theorized as increased liquidity implies less money for interest earning assets (Iacobelli, 2017). However, it can also be said to have a positive impact on earnings as it reduces risk (Sufian & Chong, 2008). This positive impact is observed in Abdus (2015) study on bank profitability.

3.2.3 Credit risk

Credit risk is usually associated with higher return assets. The banks management has to ensure high return assets with low risk of default thus generally credit risk is usually associated with reduced profitability. Poor quality assets and low liquidity levels are said to be the major reasons banks fail therefore their negative impact on profits can be said to be dominant and significant (Iacobelli, 2017). Financing theory suggests that increasing risks, by increasing leverage and thus lowering the equity-to-asset ratio (increasing leverage), leads to a higher expected return as entities will only take on more risks when expected returns will increase; otherwise, increasing risks have no benefits. This theoretical explanation is known as the risk-return trade off (Aremu 2013). Empirical studies by Iacobelli (2017), Khizer (2011) and Abdus (2015) found credit risk to have a negative impact on bank profits whilst Bukhari & Qudous (2012) found a positive relationship.

3.2.4 Bank size

The size of a bank has been found to significantly affect profits in various researches. Bank size is found to have a positive effect on earnings as it allows for economies of scale and asset diversification reducing risk. When the size of a bank increases, more deposits can be obtained at lower costs thus increasing profits. The size will also encourage technological advances which will improve efficiency and consequently profits. Empirical studies like that of Abdus (2015), Khizer (2011) and Nayeem & Kumruddin (2014) found bank size to positively affect profitability. Other authors; Hoffmann (2011), however find that increase in bank size could have diseconomies of scale. This could be due to increased bureaucratic processes increasing inefficiency (Hoffman, 2011).

3.2.5 Market Concentration

Berger (1995) in his research on bank profitability established a bank profitability theory based on the market structure of the banking industry. Three main hypotheses emerged, i.e. Market Power Hypothesis (MP) also referred to as Structural Conduct Performance Hypothesis (SCP), Relative Market Power Hypothesis (RMP) and Efficient Structure Hypothesis (ESX). SCP hypothesis suggests a positive relationship between market concentration and profitability as it asserts that banks are able to extract monopolistic profits as they can charge lower deposit rates and higher loan rates. Thus the theory is based

on monopolistic markets where banks can easily make cartels implicitly or explicitly. The more concentrated the banking industry, the more profitable it will be (Staikouras & Wood, 2004). RMP hypothesis also supports the SCP notion but goes further to state that an individual bank will earn more profits when it increases its market share. With a larger market share and well-differentiated product, a bank can adjust its pricing and increase profits. ESX hypothesis asserts a positive relationship between market concentration and profitability as increased market share will increase ability to make profits or efficiency resulting in increased market concentration. This hypothesis is based on managerial efficiency which is difficult to proxy objectively hence RMP and SCP are more commonly applied empirically (Iacobelli, 2017).

Empirical studies by Hoffmann (2011) and Nayeem & Kumruddin (2014) found market concentration to have a positive impact on bank profits.

3.2.6 Conclusion

The theoretical arguments presented above are consistent with several empirical finding in both developing and developing countries. However, only some are expected to hold in the Zambian banking industry. Modigliani-Miller theorem is based on a perfect money market which may not hold in a developing country. Thus increased capital adequacy may positively affect bank profitability and reduce bank failure. The banking industry market structure is said to be monopolistic based on Simpasa (2013) and thus increase in market share and/or bank size is expected to positively affect bank profitability. Liquidity risk and credit risk are expected to have negative impact on profitability as seen in the past due to low financial development.

3.3 Empirical review

This section reviews various empirical studies done on the determinants of bank profitability in both developing and developed countries. The studies focus on either the effect of internal factors only or both internal and external factors on bank profitability. The studies also use various measures to represent bank profitability such as Return on Assets (ROA), Efficiency in the return on Equity (EFCROE), Return on Equity (ROE), Capital ratio (CAP) and Net Interest Margin (NIM). The empirical literature will be

reviewed beginning with panel studies, then developed countries and finally those focusing on developing countries.

3.3.1 Studies on various countries

Iacobelli (2016) studied the factors determining bank profitability of top 16 global banks using a panel over the period 1980-2015. This study looked at the effect of bank characteristics, industry structure and macroeconomic variables on profitability and using Fixed Effects and Generalised Method of Moments (GMM), all factors were found to be important in explaining bank profitability. However, Bank specific factors are found to have the most significant effect on profits. Bank capital has a positive impact on profit, measured using ROA and ROE, whilst credit risk and operating efficiency have a negative impact.

Demirguc-Kent & Huizinga (2000) analysed the determinants of bank profitability in 43 developing and developed countries. The study covers the period 1990-1997 with profitability measured as net interest margin over total assets. The studies' aim was to determine the impact of financial structure on bank profitability. The results showed that increased financial development reduces profit as it increases competition and efficiency resulting in lower profits. The results also show that bank specific factors have the most significant effect on bank profitability.

Hassan & Abdel-Hameed (n.d) did a paper on the determinants of Islamic bank profitability. The purpose of the study was to examine the relationship between profitability and the banking characteristics after controlling for economic and financial structure indicators. The results showed that the regulatory tax factors are significant in the determination of bank performance whilst reserve requirement do not have a huge impact on the profitability measures. GDP growth rate have a strong positive impact on the performance measures, while, per capita GDP seems to have limited effect on performance. Inflation rate and its interaction term with GDP do not seem to have a significant impact on bank performance. The study also found that the size of the banking system had a negative impact on the profitability except net non-interest margin which is peculiar because it goes against prior expectations.

3.3.2 Studies on developed Countries

Hoffmann (2011) examines the determinants of the profitability of the US banks during the period from 1995-2007. The analysis combined bank specific (endogenous) and macroeconomic (exogenous) factors and used a panel on 11,777 US banks. The efficiency in the return on equity (EFCROE) is used as dependent variable and regressed against the capital ratio (cap) and other endogenous factors like bank size, market concentration, loan capacity, demand for deposits, interest expenses, investment in securities, the bank's risk, plus a series of control variables like the USA Federal Reserve Bank discount rate, the NASDAQ bank Index and the bank's reputation. Bank size is measured as the natural logarithm of total assets. The study had two measures of market concentration namely the Herfindahl index of market concentration and the bank's share of market deposit per year and per state. Moving on to loan capacity, the measure was total gross loans and leases over total assets and demand for deposits was measured by total deposit over total assets. Hoffmann (2011) stressed that investment in securities should have a positive relationship to the bank's performance, in which case this variable was measured as the investment in security at market value over total assets. To measure the bank's risk, the analysis used the standard deviation of return on equity over the time span. The USA Federal Reserve Bank discount rate appears as an external determinant for the cost of intermediation. Lastly the proxy for bank reputation is the natural logarithm of the number of years since the foundation of the bank. The results showed that there was a statistically significant negative relationship between the size of the bank and its profitability in the pooled, fixed effect, and in the system estimator regressions. This could be because diseconomies of scale come to play when the bank size increases. Both measures of market concentration had a positive and statistically significant impact on profitability. The demand for deposits has a negative relationship with the bank's profitability implying intermediation may be a cost on profits. Hoffmann (2011) explains that the results show that the ex-post asset substitution problems originated by the deposit increase in the agency cost of external sources of funds. These higher agency costs lead to a lower profitability. The interest expenses have a negative connection with profitability.

3.3.3 Studies on Developing Countries

Mohammad (2013) discusses the management controllable factors that determine bank profitability of the Jordanian commercial banks listed in Amman Stock Exchange ASE. Mohammad (2013) derives the bank specific variables from income statements and balance sheets of commercial banks published in ASE set from 2005 to 2011. The study used descriptive analysis, financial ratio analysis, Pearson correlation analysis, regression analysis and Analysis of Variance (ANOVA) to test the hypotheses. The major outcome of the paper was that profitability of the Jordanian commercial banks is influenced by operational efficiency (cost to income) the other variables liquidity risk, credit risk, credit composition (net credit to total assets), capital adequacy (equity to assets) and bank size did not show any statistical effect on profitability. Unlike other studies, this study used only one measure of profit ROA, which may have led to most variables being insignificant.

The study by Khizer (2011) analysed the profitability of the banking sector of Pakistan for the period from 2006 to 2009. On the micro independent variables front, profitability seemed to have been positively affected by bank size, operating efficiency, portfolio composition, asset management and negatively by capital and credit risk in the case where profitability is measured by ROA. When profitability was measured by ROE, profit was found to be positively affected by capital, portfolio composition and asset management whilst size, operating efficiency and credit risk had a negative impact on profit. On the macroeconomic variables, GDP was found to have positive effect on profitability (when profit was measured by both ROA & ROE).

Bukhari & Qudous (2012) also studied the banking sector in Pakistan. Their study used panel data for the period 2005 to 2009 that was taken on a quarterly basis for 11 banks in Pakistan and used only ROA to measure profit. Analysis is done using a random and fixed effects model, regressing profitability against 11 independent variables; bank size, advances (loans), deposits (liability), non-interest income, credit risk, interest income, expense management, discounted rate, imports, exports and CPI. Multicollinearity was found between deposits and size of the bank (0.916046) and in imports and exports (0.890318) thus deposits and imports are dropped from the model. It was found that unlike Khizers' (2011) study, size had no impact on profit probably due to the different measures

of profit employed. Similarly, non-interest income, expenses, exports, CPI and discount rates have an insignificant relationship with profitability of the banks. However, advances, interests and credit risks were found to have a significant relationship with profitability of banks, where advances and credit risk have positive impact on the profitability of banks (contrary to Khizers' study) and interest has negative impact on the profitability of the banks. Providing an approach of using ratios could have eliminated the presence of multicollinearity in the model. Therefore, the present study will use ratios to eliminate the presence of Multicollinearity and avoid loss of variables that may be important.

Nayeem & Kumruddin (2014) found that bank size, higher cost efficiency, capitalization, and higher concentration tend to increase the profitability of Bangladesh banks. On the other hand, higher taxation, higher banking assets to GDP tend to decrease profitability in the Bangladeshi banking sector. There were mixed findings about the effect of credit risk, loan to total asset, non-traditional activity, labour productivity and inflation on banking profitability in terms of ROA and NIM. Lower credit risk appeared to increase the NIM, while higher NIM could also be explained by a lower loan to total asset ratio. Higher labour productivity and higher non-traditional activity seemed to lead to a higher ROA. The study also identified a negative relationship between inflation and profitability in terms of ROA. This may be due to underlying economic policy factors yet to be identified and critically evaluated through empirical research.

Abdus (2015) also discussed the impact of bank specific characteristics and macroeconomic variables in determining bank profitability of the Bangladesh banking industry. This study used panel data consisting of 42 Bangladesh commercial banks for the period 2009-2011. The dependent variable, profit, was measured using ROA and ROE. The independent variables included liquidity risk; measured by total loans as a percentage of total assets and loan as a percentage of deposits, credit quality; measured by loan loss provision as a percentage of total assets and non-performance loan as a percentage of total loan, bank operational efficiency; measured by the net interest margin as a percentage of total operating expenses and operating expense to total assets, capital efficiency; measured as bank's equity capital as the percentage of total assets, bank size; measured as log of assets and deposits and macroeconomic factors. The study revealed that all bank specific

variables are statistically significant and key in determining bank profit whereas macro-economic variables were not contrary to Nayeem & Kumruddin (2014) study. Bank size was found to be positively related to profit (the log of deposits was dropped off but log of total assets maintained) as found but Nayeem & Kumruddin (2014). Loan to deposit ratio was positively related to profit, indicating that increased liquidity risk increases profit. Loan loss provision to assets was the only variable negatively related to profit.

Aremu (2013) applies the econometric analysis of co-integration and Error Correction technique in order to find out what factors determined profitability in the banking sector of the Nigerian economy by using First Bank of Nigeria PLC as a case study. The study covered the period, 1980 to 2010. The internal determinants included total annual assets, loans, total annual non-interest income, total annual loan loss provisions, total annual overhead expenses. The study consisted of three measures of profit ROA, ROE and NIM. Results from this particular study revealed that contrary to views of other authors that ventured in similar research, bank size (natural logarithm of total assets and number of branches) and efficiency management(cost-to-income ratio) did not significantly determine bank profitability in Nigeria. This indicated that banks in Nigeria have neither benefited from economies of scale or diseconomies of scale arising as a result of ownership of large assets and increasing branch networks in the long run. However, credit risk (loan loss provision-total assets) and capital adequacy (equity-total assets) was found to be significant drivers of bank profitability both in the long run and short run whilst liquidity only affected bank profitability in the short run and labour efficiency (human capital return on investment and staff salaries-total assets) only in the long run. This study only used one particular bank which may have not represented the actual bank profitability of the banking sector in Nigeria, since in 1980 there were at least six of 22 commercial banks that were operational by end 2010 that could have been included in the research.

Zawadi (2014) examines the effects of bank specific as well as macroeconomic factors on banks' profitability in Tanzania. The study used panel data consisting of 23 banks for the period 2009-2013. The independent variables included bank size, capital adequacy, assets quality, expenses management and liquidity management as bank specific factors and

GDP, inflation rate and real interest rate as macroeconomic factors. The results suggested that larger banks and improved bank capital, assets quality, efficient management of banks expenses as well as liquidity management contribute to larger profits in Tanzanian banks. On the other hand, macro-economic factors were found to have no significant effect on profitability. Overall, results of this study show that the profitability of banks in Tanzania is mostly affected by bank specific factors rather than external factors.

In a study on the price-concentration relationship of commercial bank deposits in Zambia, Sandi (2009) found that there exists an equilibrium relationship among consumer weighted deposit interest rates (i.e. prices) and concentration ratio, per capita income and deposits held by commercial banks. The study found that per capita income, market share, concentration ratio and the growth of deposits play a significant role in determining changes in deposit interest rates in Zambia. The low per capita income of Zambia compared to other Sub-Saharan countries was found to be the reason why few people hold bank accounts with commercial banks. Zambian commercial banks, therefore, have a tendency of offering low interest on deposit accounts as opposed to the interest rate they charge on loans in order to make profits. Commercial banks concentration ratio was also found to be the major contributor to low deposit interest rates. This was attributed to the collapse of the banking system in the 1990s and the dominance of the sector by a few banks; Barclays Bank, ZANACO and Standard Bank. These banks were leading in all portfolios included in the study such as loans and advances, deposits and total assets among others. It was concluded that Zambia's highly concentrated banking market is "bad" for depositors. The study, however, looked at the determination of deposit rates but this study investigates the determinants of bank profitability in Zambia.

3.4 Synthesis

The literatures reviewed above provide a lot of insight for this research particularly on the variables to include. One thing common to the literature that has been reviewed on bank profitability is whether the impact of bank expansion (bank size) on profitability has been inconsistent in different parts of the world. For instance; Pilloff and Rhoades (2002) examines the positive relationship of the size with bank's profitability. Molyneux and Seth (1998); Ramlall (2009); Sufian (2009) found there is a positive relationship between the

banks size and bank profits and concludes that the bank size depends on the economies of scale because the larger banks were more profitable than smaller banks. On the other hand Hassan & Bashir (n.d) did a paper on the determinants of Islamic bank profitability and their results showed that the size of the banking system has negative impact on the profitability. This shows that this variable can have different effects in different countries and thus it should be included in the model.

Most studies included the both bank-specific and macroeconomic determinants of bank profitability in their model. However, most studies in developing countries i.e. Zawadi (2014); Abdus (2015) find the macroeconomic factors to be insignificant whilst the bank-specific factors are significant. Thus this study will consider bank specific factors only as done by Mohammad (2013).

Additionally, studies like Aremu (2013) found different results on the different measures of profit which implies the various factors may affect the various measures differently. Therefore this study will use all three measures of profit.

CHAPTER FOUR

MODEL SPECIFICATION AND METHODOLOGY

4.1 Introduction

This chapter describes the variables and the methodology used in the study. The chapter will first outline the methodology applied in this study then present the model to be used for analysis with each variable explicitly defined.

4.2 Research Methodology

4.2.1 Research Design

This research study employed the use of quantitative data only.

4.2.2 Target Population

The target population in this study was the Zambia banking sector over the period 2010 to 2016. All commercial banks were included in this study as commercial banks account for more than 80% of the banking sector in Zambia.

4.2.3 Sample Size

For the purpose of a balanced panel data set, of the 19 commercial banks running in 2016, the sample size consists of 17 banks as they were the total commercial banks fully operational and accrued profits in the study period 2010-2016. These include: Zambia National Commercial Bank PLC (ZANACO), Stanbic Bank Zambia Limited, Standard Chartered Bank PLC, Barclays Bank, Bank Of China Zambia limited, Finance Bank, Citibank Zambia Limited, First National Bank Zambia limited (FNB), Indo-Zambia Bank Limited, BancABC, Investrust Bank PLC, Ecobank Zambia Limited, Cavmont Bank Limited, United Bank for Africa Zambia Limited (UBA), First Alliance, Access Bank Zambia limited and Intermarket Banking corporation Limited. Therefore first capital bank and AB bank were not part of the sample.

4.3 Data Collection Techniques

Secondary data was considered given the nature of the study. The source of this data was the Bank of Zambia (BOZ) Reports, Balance sheets, Income statements and non-performing loans statement of all 17 commercial banks.

4.4 Data Analysis

The study used E-views and Microsoft excel for data manipulation and statistical inferences. Regression analysis was used to derive the relationship and significant effect of performance indicators on profitability.

4.5 Research Model

4.5.1 Model Specification

17 commercial banks were used in the analysis of the determinants of commercial banks' profits. The study considers bank behaviour over the period 2010 to 2016 and so a balanced panel is collected. The general consensus from the literature reviewed on bank profitability was that the appropriate functional form for analysis is the linear form. Short (1979), and Bourke (1989) considered several functional forms and concluded that the linear model produced results as good as any other functional form. In support of this, Williams et al (1994) and Molyneux et al (1994) had also considered a linear model in their studies on bank profitability. Therefore in this study a linear model was used to analyse cross-sectional time series data (panel) to determine the profitability of commercial banks in Zambia. Three alternative measures of bank profitability were used to estimate the model, focusing only on bank specific factors as done by Olweny & Shipho (2011), are specified below:

$$\begin{aligned}
 Bf_{it} = & \beta + \beta_1 BANKSIZE_{it} + \beta_2 CRDRISK1_{it} + \beta_3 CRDRISK2_{it} \\
 & + \beta_4 LQRISK1_{it} + \beta_5 LQRISK2_{it} + \beta_6 BANKEFF_{it} \quad (4.1) \\
 & + e_{it}
 \end{aligned}$$

Bf_{it} is measured as ROA_{it} ROE_{it} and NIM_{it}

Where:

ROA-	Return on assets
NIM-	Net Interest Margin
ROE-	Return on Equity
BANKSIZE-	log of total asset
CRDRISK1-	non-performing loans to total loans
CRDRISK2-	loan loss provision to total assets
LQRISK1-	total loans to total deposit
LQRISK2-	total loans to total assets
BANKEFF-	Equity to total assets

4.5.2 Estimation Procedure

This model can be estimated using Pooled OLS (POLS), Fixed Effects model (FEM) or Random Effects model (REM). The pooled OLS essentially ignores all cross-section effects and pools all the observations together then applies Ordinary least squares (OLS) method. Given the nature of the banking sector, where some banks are significantly bigger than others, this assumption may be unrealistic. Thus the use of Pooled OLS is likely to lead to inconsistent estimators and has not been used (Gujarati, Porter, & Gunasekar, 2012).

Fixed effects model (FEM) on the other hand assumes the cross-section effects (individual banks) have significant individual effects on bank profits. It assumes the cross-section effect is fixed to the explanatory variables, differing over the individual characteristics but not over time. Thus in this model, the effect of each character, in this case the bank, can be estimated. This model is more realistic in regards to macro panels where a smaller group of characters is observed over a long period of time. It has the benefit of consistent estimators as opposed to the Pooled OLS model (Cameroon & Trivedi, 2005).

The last to be considered is the random effects model (REM). This model is similar to the fixed effect model in that cross-section effects are not ignored but differ in that it assumes these effects are random and not fixed to explanatory variables. Therefore in this model the

cross-section effects cannot be estimated as they are random for each bank. Since the effects are considered random, there is likely to be correlation between the effects and the errors. To ensure consistent and efficient estimators, Feasible Generalised Squares (FGLS) is used to estimate this model (Baltagi, 2005).

Though the random effects model presents an attractive option with efficient estimators, application of the REM on a model that is actually an FEM will lead to not only inefficient estimators but inconsistent estimators. Thus a test, the Hausman test, was carried out to determine whether the REM model is the appropriate model or not (Gujarati, Porter, & Gunasekar, 2012)

4.5. 3 Description of Variables

Dependent Variables: According to the literature that has been reviewed, bank profits can generally be measured in three ways, Return on Assets (ROA), Return on Equity (ROE) and Net Interest Margin (NIM). Amongst some of the studies that use all the three as measures of bank profit include Aremu et.al (2013) and Mungly et.al (2016).

Return on Assets (ROA) is expressed as net income over total assets. ROA is a financial indicator of how profitable a bank is relative to its total assets. It gives a picture as to how efficiently management is using its assets to generate earnings. The drawback of using ROA as profit measure is that off balance sheet items are excluded (Mishkin, 2004).

Return on Equity (ROE) is expressed as net income over total equity. It calculates how many kwachas of profits a bank generates with each kwacha of shareholders' equity or in other words, it measures the return of the shareholders on a unit of their capital. It indicates how well banks management is deploying the shareholders' capital. ROE on the other hand have a disadvantage in that banks with low levels of capital will generate high ROE. Low levels of capital imply that the bank's leverage is high indicating high risk (Mishkin, 2004).

Net Interest Margin (NIM) is expressed as net interest income (interest income less interest expenses) over interest income. It is a measure of the difference between the interest income generated by banks and the amount of interest paid out to the depositors, relative to the amount of their interest earning assets. NIM is performance metric that examines how successful a bank's investment decisions are compared to its debt situations. NIM is

a good measure of profit since the core business of banks is to give out loans where interest comes from and take in deposits; however it neglects non-interest sources of income and expenses such as fees, commissions, bank statement charges, advertisement and so on (Mishkin, 2004).

Independent variables: Three major determinants of bank profit as indicated in the literature review include bank size, risk (credit and liquidity) and efficiency.

Bank size is expressed as the log of total assets. Bank size account for the existing economies or diseconomies of scale. According to Goddard et al (2004) scale economies exist at low asset size levels but as size increases they become exhausted. EichenGreen & Gibbon (2001) further state that the impact of size on profitability will depend on whether the larger banks are still enjoying economies of scale due to their decreased fixed cost per unit or whether bureaucratic costs has smothered the advantages that they were previously enjoying. On the other hand Berger & Humphrey (1997) suggest that large banks on average are more efficient than small banks and that it is unclear whether large banks benefit significantly from economies of scale. Profitability is more likely to be enhanced by emulating industry best practice in terms of technology and management structure than by increasing size per se.

Efficiency/capital ratio (BANKEFF) is expressed as banks equity capital as percentage of total assets. Capital ratio is an important instrument for analysing profitability of banks as it reveals the general protection and reliability of a bank. Research shows that banks with high intensity of capital produce better results as compared to low intensity banks. Berger & Humphrey (1987) conclude that well capitalised banks suffer a little price of bigger investments and as such leads to the higher profitability. An excessively high capital ratio could also denote that a bank is operating conservatively and ignoring potentially profitable investment opportunities. High levels of capital imply that the bank is unlikely to earn high profits but is less liable to risk and therefore shareholders should be willing to accept a lower return on equity.

Risk generally creates difficulty in running a bank and its general operations. It can be split into two types' credit risk and liquidity risk.

Liquidity risk (LQRISK1 and LQRISK2) is expressed as total loans to total deposits ratio and total loans to total assets ratio. Liquidity risk is the risk that occurs when a bank may be unable to honour financial obligations on demand. This occurs due to the inability to convert a security or assets to cash without loss of income in the process. Although there is an opportunity cost of holding liquid assets, liquidity risk leads towards having problems in generating funds and failure to handle unexpected variation in the sources of financing. Different results have been found as to whether liquidity risk has a positive or negative impact on profit. Bourke (1989) found that there is a positive link between liquidity risk and bank profit while Molyneux & Thornton (1992) came to the conclusion that there is a negative relationship between the two.

Credit risk (CRDRISK1 and CRDRISK2) is expressed as non-performing loans over total loans and loan loss provision over total assets. Credit risk is most simply defined as the potential that a bank borrower or counterpart will fail to meet their obligations in accordance with the agreed terms. For most banks, loans are the largest and most obvious source of credit risk thus changes in credit risk may reflect changes in the health of a bank's loan portfolio (Cooper, Jackson, & Patterson, 2003). Previous studies regarding credit risk show a mixed picture about its relationship with profitability. Studies by Davydenko (2010), Ali et al. (2011), Sufian (2011), and Ramlall (2009) show that credit risk has a strong negative significant effect on profitability. On the other hand Zhang et al. (2013) and Syafri (2012) find a positive effect between credit risk and profitability.

4.6 Limitations

- i. The variables; quality of customer service could not be included in the model due to lack of an objective proxy variable. Similarly, cyber risk could not be included as data on a suitable proxy was unavailable.
- ii. Bank names were not indicated on the data collected from the BOZ due to policy regulation. Instead labels were given for each bank implying that no reference could be made on the type of ownership and observed results.

CHAPTER FIVE

EMPIRICAL ANALYSIS

5.1 Introduction

This chapter gives the analysis undertaken to estimate the determinants of commercial bank profitability in Zambia. This chapter begins by giving the descriptive statistics of each variable then proceeds to estimate the relationship between the various measures of bank profit and bank specific determinants. Finally, diagnostic tests were carried out to ensure reliability of results.

5.2 Regression Analysis.

Regression analysis allows the researcher to estimate the impact of independent variables on a dependent variable. It not only gives the impact but also the statistical significance of each independent variable. In this case, the impact of bank specific factors on the 3 various measures of profit is of interest. Since a panel was used, regression analysis will require use of a specific regression method depending on the characteristics of the panel.

A macro panel, a panel with larger time series relative to cross section observations, ideally has time series observations that are greater than 20. These panels are most likely to have fixed effects where the cross-sections are fixed over time as the individuals are sampled over a large period. Micro-panels in contrast have greater cross-sections observations made over a short period. For these panels, the cross-sections are likely to be random given the large sample of individuals sampled over a small time period (Baltagi, 2005)

To establish the appropriate regression model, the Hausman test was carried out. The results of this test for each of the three dependent variables are shown in Appendix, A1. The test results for each profit measure show the null hypothesis of cross-section effects being random is rejected at 1% level of significance. This entails the random effects model is not appropriate and therefore the fixed effects model should be adopted. Thus for this study, where a macro-panel is used, a fixed effects model may be more appropriate. This is confirmed with the Hausman test results.

The fixed effects model can be estimated using the covariance model, within estimator, individual dummy variable model or the least squares dummy variables model. To obtain the estimators required, the Least Squares dummy variable model will be use due to its ease and ability to assess the cross-section individual effects. This model gives consistent results only if the cross-section effects are actually fixed. The regression results are shown in table 3 below

Table 3 Regression Analysis

Independent variables	Dependent variables		
	ROA	ROE	NIM
Bank size	0.012819***	0.035183***	-0.001350***
Credit Risk1	-0.001250***	0.078570***	-0.004032***
Credit Risk2	-0.896003***	1.849147***	0.021478
Liquidity Risk1	-0.001794**	-0.014863*	-0.001064***
Liquidity Risk2	0.013511***	0.094496***	0.008688***
Bank Efficiency	0.003620	0.039159	0.005857***
Constant	-0.085120***	-0.261047***	0.010091***
R-squared	0.470202	0.173448	0.358470
Wald chi-square(6)	617.9***	47.58***	159.27***
Hausman chi-square	26.94***	23.95***	92.255***

Significance * p<0.10, ** p<0.05, ***p<0.01

5.3 Discussion of findings

Each of the equations were estimated using the fixed effects model implying the cross-section effects are fixed to the explanatory variables and cross-section effects can be estimated. The goodness of fit is estimated at 44%, 15.9% and 34.9% for ROA, ROE and NIM respectively. This implies less than half of the variation in profits is explained by bank specific effects. For a panel, this R-squared level is relatively good. Though the R-squared is not very high, the Wald test, which tests the significance of the coefficients, shows all the coefficients are simultaneously significant implying the model is suitable for measuring bank profit.

Time dummies were also added to the model to estimate the impact of changing macroeconomic environment annually. This will allow for deseasonalization of the data so that the coefficient do not represent any effects which may have occurred that year (mostly macroeconomic effects) (Gujarati, Porter, & Gunasekar, 2012). Since the period of study was 7 years (2010 to 2016), 6 dummies were included to avoid the dummy variable trap with the intercept representing 2016. The results for these dummies are shown in the Appendix A4.

The results show that the ROA decreases significantly in 2016. The other dummies show that in previous years, the time effect differed significantly as it is statistically from 2016 except for 2015. Similarly, 2015 had no significant impact on ROE and NIM from 2016s' effect. This could be due to the similar changes in macro economy that occurred in 2015 and 2016 as exchange rates depreciated. However, for NIM, the intercept is positive implying increase in average profits that year. The other time dummies show that the average profit does not differ much from the 2016 effect except for 2013. This could be due to changes in capitalization (increase in capital requirement) which occurred in 2012 leading to a fall in return on equity. Similarly, ROE in 2012 is also observed to have a statistically similar impact on ROE in 2016 where profits decreased as it is not statistically significant. Generally, the time effects seem to have less impact on the NIM profit measure as opposed to ROA and ROE.

The results show that there is a positive and significant relationship between bank size and two profit measures, ROA and ROE. Bank size is theorised to have a positive impact on profit as an increase in the size implies economies of scale, increasing profit as observed by Zawadi (2014) and Abdus (2015) study in developing countries. However, for NIM, which is measured as net interest income as a ratio of the total assets, it is observed to be negative. This could be due to increased inefficiencies with increased bank size. As the banks engage in more lending and borrowing, their risk reduces and thus there is likely to be a reduction in the net interest margin. This may reduce income from this sector relative to the growing assets as shown by Saona (2011) who focuses on other measures of profit. NIM generally shows profitability based on loans and investment ignoring other profit

activities like commissions. This shows bigger banks may not be making more profits from investments but other profit making activities as shown by positive ROA and ROE. All the profit measures are significantly affected by changes in bank size implying increasing the size of the bank may be desirable for most banks. However, the inefficiency arising from increasing bank size is clearly depicted by NIM changes and thus caution is necessary as banks seek to increase their size.

Credit risk 1 is observed to have a negative impact on profit for two of the profit measures used. This credit risk is measured as ratio of non-performing loans to total loans and thus is generally expected to have a negative impact on profits as observed by Nayeem & Kumruddin (2014) and Zawadi (2014). The negative impact of the non-performing loans ratio to ROA and NIM are very similar as increasing in non-performing loans directly implies less income for the banks and thus the income relative to the assets diminished. However, theory suggests increase in this credit risk is due to acquisition of increase high return assets. Thus for ROE, which is a measure of return on the equity and not the assets, increase in high return assets though high risk, implies greater return on equity as a higher return is expected on a lower investment. This effect seems to be significant as the impact of non-performing loans on the ROE is observed to be negative and statistically significant.

The second measure of credit risk also has a negative impact on ROA but a positive impact on ROE and NIM. This measure of credit risk looks at the ratio of loan loss provision to total assets and thus the increase in the loan loss is expected to reduce the return on assets (ROA).

To explain the existence of the positive impact on ROE and NIM, the definition of loan loss provision is considered. Loan loss provision is the money that a bank sets aside to cover potential losses on loans. For instance, if a bank gives out a loan of K100 at an interest rate of 20%, the income at end of year is K120. If after six months the bank believes that the borrower will default it creates a provision for the estimated loss say K60. If the K60 is paid (no default by the borrower) then the profit is made (ROA, ROE and NIM have positive reaction as there is increase in interest income and the income expense is reduced). However, if part or the entire remaining loan is defaulted, the loss will be considered

income expense which directly affects the ROA. The interest income remains unaffected as the loss is considered under the income expense when the loan loss provision increases. Thus increase in the ratio of loss loan provision to assets increases ROE and NIM as assets are allocated to income expense increasing liabilities while equity and interest income stays the same. Additionally, loan loss provision implies in high risk assets and therefore an increased interest income and higher return on equity made. Thus increase in loan loss provision, though an increase in expenditure, implies increases expected return and thus has a positive impact on the returns of the equity holders. It may also be true for Zambian banks that when the allocation to loan loss increases, banks resort to lower risk assets such as government securities that may instead increase the profit leaves.

The first measure of liquidity risk, the ratio of total loans to total deposits, has a negative impact on all measures of profit. Ideally, an increase in this ratio indicates an increased proportion of available funds being given out in loans thus reducing the liquidity available. The results shown indicate that when banks increase the amount of loans made from their deposits, the profitability of the bank reduces. Increasing liquidity risk implies less money is available for other high return activities thus reducing the profit margins. This indicates banks in Zambia may be making higher returns from other securities or operational activities as opposed to that obtained from loans. This result is however only statistically significant when observed in relation to NIM and ROA. It could be due to the fact that NIM focuses on interest earning assets and thus it is more likely to reflect the loss of interest income incurred when liquidity increases (loans to deposit ratio increases) as opposed to profit relative to equity.

The second measure of liquidity risk is the ratio of total loans to total assets, where loans are assumed to be illiquid so that increasing this ratio increases liquidity risk. For all the profit measures used, this measure of liquidity risk is observed to have a statistically significant positive impact on profit. As stated by Sufian and Chong (2008), increased liquidity increases consumer confidence which increases deposits and additionally reduces loan loss provision. The ratio of loans to assets as opposed to ratio of loans to deposits shows its increase leads to increased bank profits. This shows that loans play a key role in

providing interest income relative to all the assets increasing the banks' profits. But when these loans are measured against the money used to the loans (deposits), the loans do not increase profits. This suggests loans in the Zambian banking sector carry a huge proportion of deposits used to create money but relative to all the banks' profits, loans do not provide the largest return. This again suggests other interest earning activities such as government securities may be proving Zambian banks with greater profits (Mlachila & Yabara, 2013).

Lastly, the efficiency ratio i.e. capital to total assets is observed to have a positive impact on profit on all profit measures. In relation to NIM, efficiency has a strong positive impact on profit as observed by Mohammad et al (2014). These results indicate that the banks that finance different projects using their own equity and assets are earning higher returns on their investments because they have to pay nothing (to depositor) as cost of the financing, hence interest earning goes up. The positive relationship observed in the second model is in line with the works of Goddard (2014), Berger (1995) and Zawadi (2014).

5.4 Diagnostic tests

Diagnostic tests are carried out to ensure reliability of the results obtained in the regression model above. They encompass stability tests, normality tests, tests for autocorrelation, heteroscedasticity and multicollinearity. In most cases, the presence of heteroscedasticity and autocorrelation may lead to inefficient and inconsistent estimators. However use of fixed effects model ensures the estimators are consistent. Therefore only test for multicollinearity is carried out.

5.4.1 Test for Multicollinearity

Multicollinearity is a phenomenon in which two or more independent variables in a multiple regression are highly correlated, meaning that one can be linearly predicted from the others with a substantial degree of accuracy. High multicollinearity, ideally above 0.8 correlation between or amongst variables, will lead to high standard errors and thus insignificant t-ratios. Therefore, it is important that we conduct a correlation analysis to check for the presence of multicollinearity.

Table 4 Test for Multicollinearity

	CRDRISK1	CRDRISK2	LQRISK1	LQRISK2	BANKEFF	BANKSIZE
CRDRISK1	1	-0.00198	-0.0324	0.005867	-0.3208	-0.19527
CRDRISK2	-0.00198	1	0.05483	0.08953	-0.03356	-0.027499
LQRISK1	-0.03234	0.05483	1	0.714098	-0.04881	-0.01904
LQRISK2	0.005867	0.08953	0.714098	1	-0.2549	0.10559
BANKEFF	-0.3208	-0.03356	-0.04881	-0.2549	1	-0.2249
BANKSIZE	-0.19527	-0.027499	-0.01904	0.10559	-0.224963	1

As is shown in Table 4 above, none of the figures is greater than 0.8. This shows that multicollinearity is not high enough to warrant any concern in this model.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The study examined the determinants of the profitability of commercial banks in Zambia. An important point was to establish what banks, in their own capacity, can do to increase their profits. Some theoretical and empirical reviews were employed to support the relationship between banks' profitability and determinants of banks' profitability. A panel was used to analyse the profitability of 17 commercial banks for the period January 2010 to December 2016. To measure profit, three different measures were used, i.e. ROA, ROE and NIM as they represent different factors of concern in commercial banks.

6.2 Conclusions.

Based on the literature reviewed, most commercial banks have their profits significantly affected by internal factors such as liquidity ratio, capital ratio, bank size and credit risk. According to the PWC (2017) banking survey, most Zambian banks are well capitalised and solvent. Thus it is expected that capital inadequacy and liquidity risk be of little worry to Zambian banks. The capital adequacy ratio is slightly above the sub-Saharan average of 12% at 14.5%. The average ratio of non-performing loans to total loans is lower also lower for Zambian banks than the sub-Saharan average of 8% (Mlachila & Yabara, 2013). To determine if these factors are significant determinants of profitability in Zambian banks, a Fixed effects model (FEM) was adopted after the Hausman test was carried

The Return on Assets is observed to be significantly determined by the size of the bank, credit risk and the liquidity. Increased bank size and liquidity risk (loans to assets ratio) seem to have a positive effect on the profit while increased capital adequacy has no significant impact on the ROA. This suggests the existence of economies of scale in the banking system and little impact of increased capitalization on assets return (bank efficiency is insignificant). Credit risk, as expected, diminishes the ROA as the probability

of default increases. Liquidity risk has both negative and positive impacts on profit when considered in relation to deposits and assets respectively. This could further explain why ROA is lower than the other profit measures as loans in relation to deposits may be high but relative to assets, is low. Thus much of the total assets available to the bank (through capital) may be allocated to other operating costs that have no interest income.

ROE is observed to be determined significantly and positively by the bank size, credit risk and liquidity risk. This again indicates economies of scale and acquisition of higher return assets increasing the return on equity as expected. The increase in loans also increases the return on capital investment however increased capitalization has not significantly increased return on equity. Based on the conclusion drawn from the ROA model, these results are expected since the focus is on the return on capital invested and not the total assets where a significant amount may be allocated to other expenses.

Finally, NIM is significantly determined by all the variables included i.e. bank size, bank efficiency, liquidity risk and credit risk. Here, economies of scale are not observed as focus is on the return on the investments made. When bank size increases, loan default is more likely to increase as screening measures may be strained thus reducing the return from loans and other investments. Capital adequacy in this case has a positive significant impact on profit. Though it has no significant impact on the other profit measures, increasing capital may increase the return on investments. This could be due to increase in other potential securities like government securities which form about 60% of securities purchased by commercial banks in sub-Saharan (Mlachila & Yabara, 2013). The results also suggest higher profits may be coming from other investments as opposed to loans so that liquidity risk (measured as loans ratio to deposits or assets) appears to have a positive impact on profit.

6.3 Recommendations

Based on the results found in this paper, it is advised that banks continue to increase their bank size but at the same time invest in credible portfolios to avoid loan default and increase in the non-performing loans and consequently reduce loan loss provision

In view of the findings, the following recommendations are made;

- i. With reference to the table in the appendix B from Bank of Zambia, personal loans make up about 24.2% of total loans making it the highest form of disbursed loans. Most of these loans are not commission based loans and thus no collateral is given on them. It is recommended that bank develop a policy regulation that limit the percentage that banks can lend out without any form of collateral. This will allow for commercial banks to be protected from the high default observed in this study.
- ii. More efficient banks produce higher profits than less efficient banks however the range of percentage of assets being financed by equity is 35% to as low as 7%. This indicates that banks use more of people's money (deposits) to convert to investment assets despite the increase in capital adequacy. It is recommended that banks create a policy that limit the percentage of assets that are being financed by depositors to 80% and try not to go beyond that percentage.
- iii. It is also recommended that banks find more efficient ways to run their day to day activities to reduce on their expenses made. This will increase the total assets allocated to investments thus increasing their profitability.
- iv. Basic financial literacy should be given to potential investors and thorough screening processes introduced to reduce on loan default.

6.3 Recommendations for further Research

It is projected that the study will fill the gap of empirical studies on the determinants of bank profitability in Zambia. Researchers intending to further study this area are advised to consider bank specific as well as industry specific and macroeconomic determinants of bank profitability, this study can also be extended to cover longer time periods. Industry specific variables like government securities should also be considered as they seem to play a key role in commercial banks' profits. Other studies can consider bank specific factors measured differently and employ use of other econometric procedures like Generalised method of moments (GMM).

REFERENCES

- Abdus, S. (2015). *Determinants Bank profitability: Empirical Evidence from Bangladesh Commercial Banks*, International journal of financial research, 6(3).
- Aburime, U. T. (2009). *Impact of Political Affiliation on Bank Profitability in Nigeria*. *African Journal of Accounting, Economics, Finance and Banking Research*, 4 (4), 61-75.
- Albertazzi, U., & Gambacorta, L. (2009). *Bank profitability and the business cycle*. *Journal of Financial Stability*, 5, 393-409.
- Alexiou, C., & Sofoklis, V. (2009). *Determinants of Bank Profitability: Evidence from the Greek Banking Sector*. *Economic Annals*, 54 (182), 93-118.
- Anthanasoglou, P. P., Brissimis S., Delis M. D. (2005). *Bank-specific, Industry-specific and Macroeconomic Determinants of Bank Profitability*, Bank of Greece, Working Paper No.25.
- Athanasoglou P. P., Brissimis, S. N., & Delis M. D. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *International Financial Markets Institutions & Money*, 18, 121-136.
- Aremu, M. A., Imon, C., & Mustapha, A. M. (2013). Determinants of Banks' Profitability in a Developing Economy; Evidence from Nigerian Banking Industry. *Interdisciplinary Journal of Contemporary Research in Business*, 4(9), 155-181.
- B, E., & D, G. H. (2001). *Greek Banking at the Dawn of a New Millenium*. CEPR Discussion Paper.
- Baltagi, B. H. (2005). *Econometric Analysis of Panel Data*. (3, Ed.) West Sussex, England: John Wiley & Sons, Ltd.
- Banda, C. M. (2010). *The Determinants of Banking Sector Interest Rate Spread in Zambia*. Lusaka: University of Zambia.
- Bank of Zambia, B. (2006). *Bank of Zambia Annual Report 2005*. Lusaka: Bank of Zambia.

- Bank of Zambia, B. (2014). *Annual Report 2013*. Lusaka: Bank of Zambia.
- Bank of Zambia, B. (2017). *Annual Report 2016*. Lusaka: Bank of Zambia.
- Berger, A. N., Hanweck, G. A., & Humphrey, D. B. (1987) *Competition viability in banking; scale, scope and product mix economies* Journal of Monetary Economics.
- Berger, A. (1995). *The Profit –Structure Relationship in Banking: Tests of Market-Power and Efficient-Structure Hypotheses*. Journal of Money, Credit and Banking, 27 (2), 404-431.
- Bourke, P. (1989). *Concentration and other determinants of bank profitability in Europe, North America and Australia*. Journal of banking and finance 13(1) 65-79.
- Bourke, P. (1989). *Concentration and other determinants of bank profitability in Europe, North America and Australia*. A journal on banking and Finance pp 65-79
- Brownbridge, M. & Gayi, S. (1999). *Competition in Africa banking industry*, London UK, James currey ltd
- Bukhaari, S. & Quodous, R. A. (2012). *Internal and external determinants of profitability of banks; Evidence from Pakistan*, Interdisciplinary Journal of Contemporary Research in Business 3(9).
- Cameroon, C., & Trivedi, P. (2005). *Microeconometrics; Methods and Applications*. New York: Cambridge University Press.
- Chiumya, C. (2004). *Banking Sector Reform and Financial Regulation; Its Effect on Access to Financial Services by Small Income Households*. Manchester: Institute for Development Policy and Management.
- Cooper, M. J., Jackson, W, E. & Patterson, G. A. (2003). *Evidence of predictability in cross-section of bank stock returns*. Journal of Banking and Finance 27(5), 817-850
- Davydenko, A. (2010). *Determinants of Bank Profitability in Ukraine*, Undergraduate review 7(1)

Demirguc-Kunt, A., & Huizinga, H. (2000). *Financial Structure and Bank Profitability*. Development Research Group, Department of Economics. World Bank.

Dietrich, A., & Wanzenried, G., (2011). *Determinants of bank profitability before and during the crisis: Evidence from Switzerland*. Journal of International Financial Markets, Institutions and Money, 21 (3), 307-327

Eichengreen B. and Gibson H. D., (2001). *Greek Banking at the Dawn of the New Millennium*. CEPR Discussion paper No. 2791.

European Investment Bank, E. (2015). *Recent Trends in Banking in sub-Saharan Africa; From Financing to Investment*. Luxembourg: European Investment Bank.

Goddard, J., Molyneux, P. & Wilson, J., (2004). *Dynamics of Growth and Profitability in Banking*, Journal of Money, Credit and Banking 36, 1069-1090

Gujarati, D., Porter, D., & Gunasekar, S. (2012). *Basic Econometrics*. (5th, Ed.) New Delhi: McGraw Hill.

Javaid, S., Anwar, J., Zaman, K. & Gafoor, A., (2011). *Determinants of Bank Profitability in Pakistan: Internal Factor Analysis*, Mediterranean Journal Of Social Sciences, 2(1)

Iacobelli, A. (2017). *Determinants of Profitability; Empirical Evidence from the Largest Global Banks*.

Khizer, A., Muhammad, F. A., & Ahmed, H. Z., (2011). *Bank-Specific and Macroeconomic Indicators of Profitability - Empirical Evidence from the Commercial Banks of Pakistan*. International Journal of Business and Social Science, 2(6); April 2011.

Khrawish, H. A. (2011). *Determinants of Commercial Banks Performance: Evidence from Jordan*, International Research Journal of Finance and Economics, issue no. 81.

Kosmidou, K., Pasiouras, F., Doumpos, M. & Zopounidis, C., (2006). *Assessing Performance Factors in the UK Banking Sector: A Multicriteria Approach*. Central European J. Operations Res. 14(1): 25-44

Kumbhakar, S. C. & Knox, L. C., (2000). *Stochastic Frontier Analysis*, Cambridge University Press.

Hassan, M. & Bashir, A., (n.d), *Determinants of Islamic Banking Profitability*.

Hoffman, P. S. (2011). Determinants of the Profitability of the US Banking Industry. *International Journal of Business and Social Science*, 2(22), 255-269.

Maverick, J. B., (2015). *What is more important for a business profitability or growth?* Short paper

Miller, S. & Noulas, A. G., (1997). *Portfolio mix and large-bank profitability in the USA*. *Applied Economics*, 29, 505-512.

Mishkin, F. (2004). *The Economics of Money, Banking and Financial Markets* (7 ed.). Boston: Addison-Wesley.

Mlachila, M. P., & Yabara, M. (2013). *Banking in Sub-Saharan Africa: The Macroeconomic Context*. New York: International Monetary Fund.

Modigliani, F. & Miller, M., (1985). *The cost of capital, corporation finance and the theory of investment*. *The American Economic Review*. 48, pp 261-297

Mohammad, A. A., (2013). *Impact of Managerial factors on commercial bank profitability: Empirical evidence from Jordan*. *Journal of academic research in accounting, finance and management sciences*. 3(3) pp 298-310

Mohammad, N. A., Parve, K & Ayreen, S., (2014). *Bank Specific, Industry Specific and Macroeconomic Determinants of Commercial Bank Profitability: A Case of Bangladesh*, *World Journal of Social Sciences* 4(3). 82 – 96

Molyneux, P. & Thornton, J., (1992). *Determinants of European Profitability; A note* *Journal of Banking and Finance* 16 pp.1173-1178 North-Holland

Mushota, M. (2002). *Cause of Collapse of Banks in Zambia; A Legal Perspective*. Lusaka: University of Zambia.

Mulenga, C. M.,(2012). *An investigation of the determinants of intra-industry trade between Zambia and its trading partners in the southern Africa Development community SADC*. Trade and industrial policy strategies.

Mungly, Y. B., & Seetanah, K., Seetanah, R., Bhuthu B, Marge, N B., (2016). *Determinants of Mauritian Commercial Banking profitability*, Proceedings of the fifth Asia-pacific conference on global business, economics finance and social science Art louise, Mauritius.

Mwaba, M., (2002). *Cause of the collapse of banks In Zambia: A legal perspective*. University of Zambia.

Myers, S. & Majluf, N. (1984). *Corporate financing and Investment decisions when firms have Information that investors do not have*, Journal of Financial Economics 13, 187-221.

Naceur, S. B., & Goaid, M. (2002). *The relationship between dividend policy, financial structure, profitability and firm value*. Applied Financial Economics, 12, 843-849.

Olweny, T. & Shipho, T. M. (2011). *Effects of Banking Sectoral Factors on the Profitability of Commercial Banks in Kenya*. Economics and Finance Review, 1(5), 01-30.

Ommeren, S. V., (2011). *An Examination of the European Banking Sector*, An Unpublished M.Sc. Thesis, Department of Accounting and Finance, Erasmus School of Economics Erasmus University, Rotterdam

Pilloff, S. J., & Rhoades, S. A. (2002). *Structure and Profitability in Banking Markets*. Review of Industrial Organization, 20, 81-98

Price Waterhouse Coopers, P. (2016). *2016 Zambian Banking Industry Survey; Adapt to Thrive*. Lusaka: Price Waterhouse Coopers.

Ramlall, I. (2009). *Bank-specific, industry-specific and Macroeconomic determinants of profitability in Taiwanese banking system: Under panel data estimation*, international Research Journal of Finance and Economics pp 34 160-167.

Sandi, S. (2010). *The Price-Concentration Relationship in the Commercial Bank Deposit Markets in Zambia*. Lusaka: University of Zambia.

Saona, P. H, (2011). *Determinants of the Profitability of the US Banking Industry Business and Economics* Department Saint Louis University – Madrid Campus, Madrid, Spain. *International Journal of Business and Social Science* 2(22)

Short, B. K., (1979). *The relationship between commercial Banks profit rates and banking concentration in Canada, Western Europe and Japan*. Pp 209-219

Smirlock, M., (1985). *Evidence on the (Non) Relationship between Concentration and Profitability in Banking*. *Journal of Money, Credit, and Banking*, 17 (1), 69-83

Sufian, F., & Chong, R. R. (2008). *Determinants of Bank Profitability in a Developing Economy; Empirical Evidence from the Phillipines*. *Asian Academy of Management Journal of Accounting and Finance*, 4(2), 91-112.

Sufian, F., (2011). *Profitability of the Korean Banking Sector: Panel evidence on bank-specific and Macroeconomics Determinants*, *Journal of Economics and Management*, 7(1), 43-72.

Syafri, (2012). *Factors Affecting Profitability in Indonesia*, The International Conference on Business and Management, 6 – 7 September 2012, Phuket – Thailand.

Staikouras, C. K., & Wood, G. E. (2004). The Determinants of European Banks Profitability. *International Business & Economics Research Journal*, 3(6), 57-68.

Tan, Y. & Floros, C., (2012). *Bank profitability and inflation: the case of China*, *Journal of Economic Studies*, 39(6).

William, D. M. L., Molyneux, P. & Thornton, J., (1994). *Market structure and performance in spanish banking*. *Journal of banking and finance* 18, 433-443

Zawadi, A. (2014). Determinants of Banks' Profitability in a Developing Economy: Empirical Evidence from Tanzania. *European Journal of Business and Management*, 6(31), 363-375

Zhang, J., & Jiang, C., Qu, B., & Wang, P., (2013). *Market concentration, risk-taking, and bank performance: Evidence from emerging economies*. International Review of Financial Analysis, 30, 149-157.

APPENDICES

APPENDIX A (RESULTS FROM ESTIMATES)

A1. HAUSMAN TEST

FOR NIM

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	46.170093	6	0.0000

FORROA

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	26.937286	6	0.0001

FOR ROE

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	23.954971	6	0.0005

A2. FIXED EFFECTS EVIEWS OUTPUT

ROA

Dependent Variable: ROA
Method: Panel Least Squares
Date: 09/24/18 Time: 14:21
Sample: 2010M01 2016M12
Periods included: 84
Cross-sections included: 17
Total panel (unbalanced) observations: 1426

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LQRISK1	-0.001794	0.000706	-2.542512	0.0111
LQRISK2	0.013511	0.002344	5.764990	0.0000
CRDRISK1	-0.001250	0.001724	-0.725038	0.4686
CRDRISK2	-0.896003	0.045601	-19.64862	0.0000
CAPEFF	0.003620	0.002329	1.554797	0.1202
BANKSIZE	0.012819	0.001007	12.72947	0.0000
D1	0.004910	0.000736	6.675048	0.0000
D2	0.005297	0.000661	8.009918	0.0000
D3	0.003658	0.000596	6.139956	0.0000
D4	0.003038	0.000547	5.558615	0.0000
D5	0.002090	0.000503	4.151092	0.0000
D6	0.000861	0.000482	1.785890	0.0743
C	-0.085120	0.006443	-13.21187	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.470202	Mean dependent var	0.000200
Adjusted R-squared	0.459583	S.D. dependent var	0.006512
S.E. of regression	0.004787	Akaike info criterion	-7.825647
Sum squared resid	0.032014	Schwarz criterion	-7.718623
Log likelihood	5608.686	Hannan-Quinn criter.	-7.785676
F-statistic	44.28044	Durbin-Watson stat	1.534154
Prob(F-statistic)	0.000000		

ROE

Dependent Variable: ROE
Method: Panel Least Squares
Date: 09/24/18 Time: 14:23
Sample: 2010M01 2016M12
Periods included: 84
Cross-sections included: 17
Total panel (unbalanced) observations: 1426

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LQRISK1	-0.014863	0.007754	-1.916765	0.0555
LQRISK2	0.094496	0.025755	3.669064	0.0003
CRDRISK1	0.078570	0.018950	4.146129	0.0000

CRDRISK2	1.849147	0.501115	3.690067	0.0002
CAPEFF	0.039159	0.025588	1.530351	0.1262
BANKSIZE	0.035182	0.011066	3.179175	0.0015
D1	0.015111	0.008083	1.869375	0.0618
D2	0.030130	0.007268	4.145807	0.0000
D3	0.008512	0.006547	1.300094	0.1938
D4	0.013017	0.006006	2.167378	0.0304
D5	0.013930	0.005533	2.517809	0.0119
D6	0.009498	0.005300	1.792089	0.0733
C	-0.261047	0.070799	-3.687138	0.0002

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.173448	Mean dependent var	0.004320
Adjusted R-squared	0.156881	S.D. dependent var	0.057292
S.E. of regression	0.052606	Akaike info criterion	-3.031849
Sum squared resid	3.866035	Schwarz criterion	-2.924825
Log likelihood	2190.708	Hannan-Quinn criter.	-2.991878
F-statistic	10.46977	Durbin-Watson stat	1.591330
Prob(F-statistic)	0.000000		

NIM

Dependent Variable: NIM

Method: Panel Least Squares

Date: 09/24/18 Time: 14:38

Sample: 2010M01 2016M12

Periods included: 84

Cross-sections included: 17

Total panel (unbalanced) observations: 1426

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CRDRISK1	-0.004032	0.000880	-4.583471	0.0000
CRDRISK2	0.021478	0.023261	0.923338	0.3560
LQRISK1	-0.001064	0.000360	-2.957233	0.0032
LQRISK2	0.008688	0.001195	7.267568	0.0000
BANKEFF	0.005857	0.001188	4.930976	0.0000
BANKSIZE	-0.001350	0.000514	-2.628143	0.0087
D1	5.02E-05	0.000375	0.133893	0.8935
D2	-1.60E-05	0.000337	-0.047533	0.9621
D3	-0.000437	0.000304	-1.438130	0.1506
D4	-0.000560	0.000279	-2.007505	0.0449
D5	-0.000264	0.000257	-1.027775	0.3042
D6	0.000393	0.000246	1.599124	0.1100
C	0.010091	0.003286	3.070461	0.0022

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.358470	Mean dependent var	0.005138
Adjusted R-squared	0.345612	S.D. dependent var	0.003019
S.E. of regression	0.002442	Akaike info criterion	-9.171971

Sum squared resid	0.008330	Schwarz criterion	-9.064947
Log likelihood	6568.615	Hannan-Quinn criter.	-9.132000
F-statistic	27.87877	Durbin-Watson stat	1.057953
Prob(F-statistic)	0.000000		

A3 CROSS-SECTION EFFECTS

CROSSID	Effect (NIM)	EFFECT (ROA)	EFFECT (ROE)
1	0.000398	-0.003844	0.003912
2	0.001939	-0.003249	-0.000525
3	0.001073	-0.001690	0.023469
4	7.61E-05	-0.003873	-0.003986
5	0.001575	0.004434	0.022960
6	0.001909	0.000412	0.004708
7	0.000143	0.001153	0.020106
8	-0.001017	0.001564	0.031218
9	0.000320	0.004703	0.005757
10	-3.83E-05	0.000967	0.010492
11	-0.000292	-0.000483	-0.038456
12	-0.002069	-0.001068	-0.013954
13	-2.07E-05	0.002939	0.011339
14	-0.000903	0.003083	0.002215
15	-0.001129	-0.004892	-0.031777
16	-0.001196	-0.002062	-0.040375
17		0.001881	-0.007433

A4. TIME DUMMIES

	ROA	ROE	NIM
2010	0.004910***	0.015111*	0.0000502
2011	0.005297***	0.030130***	-0.000016
2012	0.003658***	0.008512	-0.000437
2013	0.003038***	0.013017**	-0.000560**
2014	0.002090***	0.013930**	-0.000264
2015	0.000861*	0.009498*	0.000393
2016	-0.085120***	-0.261047***	0.010091***

APPENDIX B

B1 RESULTS FROM OTHER SOURCES

BANKING SECTOR - DISTRIBUTION OF LOANS AND ADVANCES	Dec 16		Jan 17		Feb 27	
	K'000	%	K'000	%	K'000	%
Personal Loans (Others)	5,651,005	24.2	5,840,090	25.6	5,655,877	24.8
Personal Loans (Home Mortgages)	723,500	3.1	801,266	3.5	913,288	4.0
Agriculture, Forestry, Fishing and Hunting	3,957,705	17.0	4,305,109	18.9	3,963,731	17.4
Manufacturing	2,977,924	12.8	3,087,251	13.5	2,862,830	12.6
Wholesale and Retail Trade	2,379,362	10.2	2,417,894	10.6	2,351,193	10.3
Financial Services	418,197	1.8	596,638	2.6	535,816	2.4
Transport, Storage & Communications	1,064,684	4.6	1,077,470	4.7	1,025,933	4.5
Mining & Quarrying	1,476,545	6.3	1,404,538	6.2	1,445,287	6.3
Construction	898,165	3.9	974,612	4.3	868,630	3.8
Restaurants and Hotels	323,439	1.4	338,608	1.5	275,767	1.2
Electricity, Gas, Water & Energy	515,756	2.2	473,487	2.1	391,961	1.7
Others	2,929,527	12.6	1,475,250	6.5	2,501,900	11.0
Total Gross Loans	23,315,809	100.0	22,792,213	100.0	22,792,213	100.0
Allowance for Loan Losses	1,610,900		1,615,574		1,625,873	
Total Net Loans	21,704,909		21,176,638		21,166,339	
Gross non-performing loans	2,253,456		2,310,530		2,439,402	

Bank of Zambia reports

B2. GROWTH OF COMMERCIAL BANKS IN ZAMBIA

Period	Bank
Colonial period	Standard chartered
	Barclays
	Grindlays (now Stanbic)
1965-1985	ZANACO
	Citi bank
	Indo Zambia Bank
	Meridien Bank BIAO*
1986-2005	African Commercial Bank*
	Finance Bank
	First Capital Bank
	Bank of Credit and Commerce*
	Manifold Investment *
	Zambia Export and Import Bank*
	Union Bank*
	Commerce Bank*
	Credit Bank*
	Prudence Bank*
	Safe deposit Bank* (merged First Merchant)
	First Merchant Bank*
	Cavmont
	First alliance
	New capital Bank
2005-2017	AB bank
	Access Bank
	BANCABC

	ECO Bank
	First National Bank Zambia
	Intermarket Bank Corporation
	Investrust
	United Bank For Africa Zambia

*failed Banks