



**ASSESSING PROFIT DETERMINANTS OF ZAMBIAN-OWNED
BANKS PRE AND DURING THE COVID-19 ERA**

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ABSTRACT

The objective of the study was to assess the factors that influence the profitability of Zambian-owned commercial banks throughout the period from January 2013 to December 2021, with a specific focus on First Alliance Bank (FAB), Indo Zambia Bank, and Zanaco. The study included descriptive statistics and panel data analysis to investigate the link between profitability measures (ROA and ROE) and several factors. Regression models were used to assess the financial features and performance indicators. The key findings indicate that there is a positive correlation between the Debt to Equity Ratio (DER) and Return on Assets (ROA), but this link is not statistically significant. This suggests that the DER may not have a substantial impact on ROA, and other factors such as operational efficiency may be more important. In contrast, a notable inverse correlation between Debt-to-Equity Ratio (DER) and Return on Equity (ROE) suggests that a greater dependence on debt diminishes the returns on equity, highlighting the dangers of excessive leverage. The study also discovered a possible adverse effect of Loan to Deposit Ratio (LDR) on both Return on Assets (ROA) and Return on Equity (ROE), which contradicts the belief that a higher LDR results in increased profitability. In addition, the analysis revealed that an increased proportion of deposits compared to assets (DTAR) did not necessarily improve profitability. Both return on assets (ROA) and return on equity (ROE) exhibited a negative coefficient, although it was not statistically significant. In a similar vein, the study could not uncover robust statistical proof to substantiate the expected positive correlation between Deposits to Assets Ratio (DAR) and profitability. However, a positive inclination was indicated between DAR and Return on Equity (ROE). The text study's policy suggestions and contributions advise that banks should exercise caution when leveraging and managing assets. It proposes that banks should enhance their performance by enhancing operational efficiency instead of solely relying on rising debt or deposits. These findings enhance our understanding of financial parameters and how they affect bank profitability. They question existing financial theories and promote a more comprehensive perspective on the dynamics of the banking sector. The study's thesis asserts that the factors influencing bank profitability in Zambia, specifically in relation to financial ratios such as DER, LDR, DTAR, and DAR, are intricate and do not consistently conform to traditional financial theories. Consequently, banks must reevaluate their approaches to leveraging and asset management in order to improve profitability and asset management.

DEDICATIONS

This paper is lovingly dedicated to my wife, Keresia M Moonga, and our children, Ashar Titan Mwenda, Aiden Eli Mwenda, and Archie Kaiwa Mwenda. The completion of this work came at the cost of time away from them, and I deeply appreciate their patience and support. Without their understanding and sacrifice, this achievement would not have been possible.

I also dedicate this work to the memory of my late grandfather, Mr. Leonard S Mwenda. From the moment I began my studies at the University of Zambia (UNZA), majoring in Economics with a minor in Demography within the School of Humanities and Social Sciences, he envisioned this day. He believed unwaveringly in my potential to reach this milestone. I am forever thankful for his inspiration and the role he played in my journey toward excellence. This achievement is a step toward the greatness he foresaw. May His Soul Rest In Eternal Peace.

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LIST OF ABBREVIATIONS AND ACRONYMS

BOZ	:	Bank Of Zambia
DAR	:	Debt To Asset Ratio
DER	:	Debt To Equity Ratio
DTAR	:	Deposit To Asset Ratio
EAR	:	Equity To Asset Ratio
ECB	:	European Central Bank
FSDP		Financial Sector Development Programme
GDP	:	Gross Domestic Product
LDR	:	Loan To Deposit Ratio

CHAPTER ONE: INTRODUCTION

1.1 Background of Study

The banking sector in all countries has an important effect on the economic movements. The essential role played by banks for improvement of the overall economic activities, including its mediation and its financial activities, are necessary for the economic growth of any country (Monnin and Jokipii, 2010).

A commercial bank is recognized as a bank that provides services such as accepting deposits, making business loans, and offering basic investment products that is operated as a business for profit. The commercial bank is where most people do their banking; as opposed to an investment bank. The general role of commercial banks is to provide financial services to general public and business, hence ensuring economic and social stability and playing pivotal role for sustainable growth of the economy.

The first function of the Commercial banks is to accept various types of deposits from public especially from its clients, including saving account deposits, recurring account deposits, and fixed deposits. These deposits are returned whenever, the customer demands it or after a certain time period. Next, Commercial banks provide loans and advances of various forms, including an overdraft facility, cash credit, bill discounting, money at call etc.

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).

The banking industry plays an indispensable role in fostering *permanent, sustainable, and continuous economic growth*. This complex system, comprised of diverse financial institutions, serves as the lifeblood of a healthy economy.

Within the banking sector, a variety of institutions exist, each fulfilling a specific purpose and contributing to overall profitability. Commercial banks, for instance, focus on providing loans and facilitating everyday financial transactions for businesses and individuals. Investment banks, on the other hand, specialize in raising capital for companies and governments, while central banks oversee monetary policy and ensure the stability of the entire financial system.

Several factors significantly influence the profitability of banks, and these influences manifest in diverse ways. A seminal study by Aburime (2008) highlights the critical nature of bank profitability at both the *micro* and *macro* levels of an economy.

However, the relationship between bank profitability and economic growth is not a linear one. While a healthy level of profitability is crucial for a stable and thriving financial system, both excessively high and excessively low profitability can have detrimental effects. There are Two Sides of the Profit Coin of banking;

At the *micro level*, profitability is the cornerstone of a competitive banking institution. Profits represent not just a desirable outcome, but a necessity for success in today's fiercely competitive financial landscape. They provide the cheapest source of funds for a bank, allowing for continued operation and growth. Furthermore, profitability allows banks to invest in new technologies, human capital, and risk management strategies, ultimately enhancing their ability to serve customers more efficiently and effectively.

On a broader, *macro level*, a sound and profitable banking sector possesses greater resilience against economic downturns. This translates to a more stable financial system overall. Profits generated by banks act as a crucial source of equity, particularly when reinvested back into the business. As Flamini et al. (2009) suggest, this strategy fosters "safe banks," where high profits contribute to enhanced financial stability. A healthy banking sector also facilitates financial intermediation, the process of channeling savings from depositors to borrowers who can invest those funds in productive activities. This process fuels economic growth as it allows businesses to access the capital they need to expand, innovate, and create jobs.

However, Garcia-Herrero et al. (2007) observed that excessively high profitability could be indicative of market power, especially by large banks. This market power can arise from a number of factors, including economies of scale, barriers to entry for new competitors, and information

asymmetry between banks and their customers. When banks wield significant market power, they may engage in practices that stifle economic growth. For example, they might offer lower returns on deposit accounts, disincentivizing saving and reducing the pool of funds available for lending. Conversely, they might charge high interest rates on loans, making it more expensive for businesses and individuals to borrow, thereby hindering investment and economic activity.

Furthermore, excessively high profitability can incentivize banks to engage in risky behavior. In an environment where profits are readily available, banks may be tempted to relax lending standards or take on excessive risk in pursuit of even greater returns. This can lead to asset bubbles, financial crises, and ultimately, a significant drag on economic growth.

On the other hand, too low profitability can also have negative consequences. If banks are consistently unprofitable, it can discourage private agents (depositors and shareholders) from conducting banking activities. This can manifest in several ways. Depositors may become hesitant to place their savings in banks with low profitability, fearing for the safety of their funds. Similarly, shareholders may be unwilling to invest in banks that are not generating a healthy return on their investment.

The consequence of low profitability is a capital shortage for banks. Capital serves as a buffer against unexpected losses, allowing banks to absorb financial shocks and continue to operate. Without sufficient capital, banks become more vulnerable to failure, jeopardizing the entire financial system. Furthermore, a lack of capital hinders a bank's ability to lend, as regulatory requirements often tie lending activity to a bank's capital adequacy ratio. This ultimately restricts the flow of credit to businesses and individuals, stifling economic growth.

The optimal level of bank profitability lies in a sweet spot between the two extremes. A healthy banking system requires banks to be profitable enough to attract capital, invest in themselves, and act as efficient financial intermediaries. At the same time, excessive profitability can lead to market power abuses and risky behavior, while excessively low profitability can destabilize the financial system and hinder economic growth.

The early 1990s marked a turning point for Zambia's economic landscape. Following a period of state control and intervention, the country embarked on a path of financial liberalization. This shift aimed to revitalize the Zambian banking sector and, as a consequence, propel the nation's overall

economic development. This journey of transformation has been marked by significant milestones, including the establishment of the Financial Sector Development Programme (FSDP) and a notable rise in the number of commercial banks operating within the country.

Financial Liberalization: A Catalyst for Change

According to Maimbo S (2003) Prior to the 1990s, the Zambian banking sector was characterized by extensive government ownership and control. This interventionist approach stifled competition and limited access to financial services for a large segment of the population. Recognizing the need for a more dynamic and inclusive financial system, the Zambian government initiated a series of reforms aimed at liberalizing the financial sector. These reforms dismantled state control, encouraged private sector participation, and promoted a more market-driven approach to banking. (World Bank, 2015)

The impact of financial liberalization was multifaceted. Deregulation fostered competition among banks, leading to a broader range of financial products and services being offered to customers. This included the introduction of new loan options, improved interest rates, and a greater focus on customer service. Furthermore, the influx of private investment into the banking sector provided a much-needed injection of capital, allowing banks to expand their reach and modernize their operations. (Chileshe P 2005)

In 2004, the Zambian government took a significant step forward with the launch of the FSDP. This comprehensive strategy aimed to build and strengthen the infrastructure of the financial sector, empowering it to play a more robust role in supporting economic diversification and sustainable growth. (BOZ 2009). According to the FSDP report for the period of 2004 to 2009, the Bank of Zambia report encompassed a range of initiatives, including:

Strengthening Regulatory Framework

The program focused on enhancing the legal and regulatory framework governing the banking sector. This included revisions to the Banking and Financial Services Act (2000) to ensure compliance with international best practices and promote financial stability.

Developing Financial Infrastructure

The FSDP aimed to create a more robust financial infrastructure. This involved initiatives to modernize payment systems, improve credit information sharing mechanisms, and expand access to financial services in rural and underserved areas.

Enhancing Financial Literacy

Recognizing the importance of an informed citizenry, the FSDP incorporated programs to promote financial literacy among the Zambian population. These initiatives aimed to educate citizens about various financial products and services, empowering them to make informed financial decisions.

A Growing Landscape: The Rise of Commercial Banks

The liberalization of the financial sector and the implementation of the FSDP have demonstrably impacted the landscape of Zambia's banking sector. In 2006, there were only 13 commercial banks operating alongside the central bank, the Bank of Zambia (BOZ). The Bank of Zambia acts as the regulator and supervisor of the banking sector, ensuring compliance with financial regulations and safeguarding the stability of the financial system. (Zambia Financial Sector Deepening Partnership, 2007)

However, the years that followed witnessed a surge in the number of commercial banks. Foreign investor confidence in the Zambian economy, coupled with a more liberalized environment, paved the way for the entry of new players. Between 2008 and 2012, a total of six subsidiaries of foreign banks were registered with the Bank of Zambia. This influx of foreign capital further strengthened the banking sector and broadened the range of financial products and services available to Zambian businesses and individuals. By the end of 2012, the total number of commercial banks operating in Zambia had risen to 19, signifying a significant expansion of the financial sector.

According to Maimbo S (2003) while the liberalization of the financial sector and the FSDP have yielded positive results, challenges remain. Ensuring financial inclusion and expanding access to financial services in remote areas is an ongoing priority. Furthermore, promoting financial literacy and empowering citizens to make informed financial decisions will be crucial for sustained growth. The regulatory framework must also adapt to evolving trends in the financial landscape, ensuring stability while fostering innovation.

Despite these challenges, the future of Zambia's banking sector appears promising. The groundwork laid by reforms and strategic interventions has created a more dynamic and competitive environment. With continued commitment to building a robust financial infrastructure and promoting financial inclusion, Zambia's banking sector is well-positioned to play a vital role in driving sustainable economic growth and prosperity for all its citizens. (BOZ 2005)

As of 2012, 19 commercial banks with approximately 280 branches were present in the country. There has been no entry of new banks since then, thus the number remained the same as of December 2014. Of the 19 banks, 8 are subsidiaries of foreign banks, 9 are locally owned and 1 is partly owned by the Zambian, Indian and the Netherlands governments respectively (FSR 2014). As of 2021, the number of locally owned banks reduced to only 5 because, for instance, Finance Bank which was a locally owned was sold to Atlas Mara and is now recognized as a foreign Bank.

The COVID-19 pandemic caused a significant global economic shock, triggering the deepest global economic recession in nearly a century (OECD 2020,). Although the global economy is on the journey to recovery, the rebound is expected to be uneven across countries, with strong growth in major economies even as many developing economies lag (World Bank 2021). Sub-Saharan African countries are among the most severely affected by the pandemic and are expected to have suffered serious setbacks in development and per capita income gains by at least a decade (African Development Bank 2021; World Bank 2021).

The African financial sector has not been spared from the pandemic, which exposed financial institutions to extraordinary operational and financial challenges. The COVID-19 pandemic contributed to a sharp rise in defaults of corporate and household debt, adversely affecting the financial performance of banks and their ability to intermediate credit and support an economic recovery (Barua and Barua 2020).

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. (Naminda Moomba 2019)

There was need to explain the determinants of Bank profitability on selected Zambia-owned banks in light of the COVID 19. The impact that on foreign banks might be different on local banks. We cannot for certain say that they have been affected the same way and we do not have evidence to support that claim. Due to limited empirical evidence on determinants of bank profitability on Zambian-owned banks, there is need to fill this research gap and contribute to a better understanding of the drivers of bank profitability for locally owned banks.

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.

Table 1: Profitability Indicators

Variables	Measurement	Source of data collection	References
Return on asset	ROA% = Net profit after tax/total assets	Banks Audited Financial Statement	Athanasoglou et al., <u>2008</u> ; Masood and Ashraf, <u>2012</u> ;
Return on equity	ROE% = Net profit after tax/ total equity	Banks Audited Financial Statement	Francis, <u>2013</u> ; Perera et al., <u>2013</u> ; Noman et al., <u>2015</u>

Source: Authors Own Table.

The study focused on bank-specific factors as they have been observed to have the most significant influences on bank profitability in past empirical researches. And the measures of profitability focused on ROA and ROE only.

Table 2: Banks' specific factors/variables (internal factors)

Variables	Measurement	References
Debt-to-Asset Ratio	DAR% = Total liabilities/Total assets	Gazi et al., <u>2021a</u>
Equity-to-Asset Ratio	EAR% = Total equity/Total assets	Staikouras and Wood, <u>2004</u>
Loan-to-Deposit Ratio	LDR% = Total loans/Total deposits	Menicucci and Paolucci, <u>2016</u> ; Regehr and Sengupta, <u>2016</u>
Deposit-to-Asset Ratio	DTAR% = Total deposit/Total assets	Rahaman and Akhter, <u>2015</u>
Debt-to-Equity Ratio	DER% = Total Liabilities/Total equity	Pradhan and Khadka, <u>2017</u>

Source: Authors Owned Compilation.

The purpose of this study was therefore to recognize the vital determinants that affect the profitability of the Zambian Owned Banks over the period 2013 to 2021. The determinants of bank profitability in literature can be divided into bank-specific factors, industry-specific factors and macro-economic factors. The study focused on **ONLY** on bank-specific factors as key determinants of bank profitability as they have been observed to have the most significant influences on bank profitability in past empirical researches.

In addition, the study provides policy implications for stakeholders, policy makers and regulators of banks in Zambia.

1.2 Statement of the Problem

Banks are fundamental to ensuring economic sustainability, with their profitability being crucial for impactful economic contributions. However, concerning trends in the Zambian banking sector have emerged, notably a significant decline in the average return on assets from 2.3% in 2019 to just 1.2% by the end of 2020, as reported by the Bank of Zambia. This decline coincides with a rise in non-performing loan ratios from 7.8% to 11.3% during the same period, suggesting a deterioration in asset quality under the strains induced by the COVID-19 pandemic.

Moreover, the pandemic prompted regulatory responses, including loan repayment moratoriums, reductions in interest rates, and enhanced liquidity supports, intended to uphold financial stability and reduce systemic risks.

The problem that this study addresses is the limited understanding of the key factors influencing the profitability of Zambia's locally owned banks during the COVID-19 pandemic. Despite regulatory efforts to stabilize the financial system, a detailed examination of how these banks have been affected remains absent, particularly in the context of Zambia's unique economic challenges.

This escalation is believed to be influenced by various bank-specific factors such as liquidity ratios and market sensitivity, as well as broader macroeconomic changes including significant GDP contraction and sharp increases in inflation during the pandemic period.

Evidenced by the dramatic decrease in the average return on assets among Zambian banks, which fell from 2.3% in 2019 to just 1.2% by the end of 2020, as reported by the Bank of Zambia. Additionally, Zambia's real GDP saw a decline of 2.8% in 2020, while the inflation rate jumped from 9.9% in December 2019 to 21.5% by December 2020, according to the Zambia Statistical Agency.

A critical but understudied issue is the determinants of profitability for locally owned banks in Zambia during both pre-pandemic and pandemic conditions. This gap in research is especially concerning given the strategic importance of these institutions in ensuring economic stability and supporting social progress under extreme economic pressures.

Failure to tackle this problem could have profound consequences on the resilience and adaptability of Zambia's financial sector, potentially leading to prolonged economic recovery times and increased vulnerability to future financial crises. This study seeks to fill the existing research void, providing crucial insights that could help strengthen financial policies and banking practices in Zambia.

This study aims to assess a range of bank-specific factors, including liquidity ratios and capital ratio, alongside macroeconomic indicators such as real GDP, which contracted by 2.8% in 2020, and the inflation rate, which escalated from 9.9% in December 2019 to 21.5% by December 2020 (Zambia Statistical Agency, 2021). By doing so, this paper seeks to uncover the determinants of profitability for locally owned banks in Zambia, both before and during the COVID-19 crisis. This

analysis addresses the current lack of empirical research on how the pandemic has influenced bank performance in developing countries, contributing critical insights into the resilience and adaptability of Zambia's financial institutions.

1.3 The Purpose of study

The objective of this study was to assess profit determinants of Zambian Owned banks Pre and During COVID-19 ERA.

1.4 Study Objectives

1.4.1 General objective

To assess the determinants of profitability of Zambian-owned banks Pre and During the COVID 19 Era.

1.4.2 Specific objectives

The specific objectives of the research includes:-

1. To investigate the relationship between **Capital Structure (DER)** and the bank profitability.
2. To examine the relationship between **Loan to Deposit Ratio (LDR)** and bank profitability.
3. To analyze the effects of **Deposit to Asset Ratio (DTAR)** on bank profitability.
4. To investigate the impact of **Equity to Asset Ratio (EAR)** on bank profitability.
5. To determine the relationship between **Debt to Asset (DAR)** and bank profitability.

1.5 Research Questions

1. What is the impact of Capital Structure on bank profitability?
2. How does Loan to Deposit Ratio (LDR) impact on bank profitability?
3. What are the effects of Deposit to Asset Ratio (DTAR) on bank profitability?
4. Does Equity to Asset Ratio (EAR) affect bank profitability?
5. Is there a relationship between Debt to Asset Ratio (DAR) and bank profitability?

1.6 Research Hypotheses

In order to attain the objective of the study, the null hypotheses are developed based on review of relevant and related literatures on the Bank Profitability to be tested. Five testable hypotheses formulated in this study are as follows:-

1. H_{01} = **Debt to Equity Ratio (DER)** negatively affects bank profitability.
2. H_{02} = **Loan to Deposit Ratio (LDR)** positively affects bank profitability.
3. H_{03} = **Deposit to Asset Ratio (DTAR)** positively affects bank profitability.
4. H_{04} = **Equity to Asset Ratio (EAR)** negatively impacts bank profitability.
5. H_{05} = **Debt to Asset Ratio (DAR)** positively impacts and bank profitability.

Rejecting the null hypothesis when it is correct Type I error is committed and accepting the null hypothesis when it is wrong you commit Type II error.

1.7 Significance of the Study

1.7.1 Theoretical Significance

The theoretical significance of this study lies in its contribution to the existing body of knowledge within the banking sector. It aims to uncover the primary factors influencing the profitability of Zambian-owned banks both prior to and during the COVID-19 pandemic. This exploration is crucial for identifying the underlying challenges and opportunities that impact the banking sector's performance. By elucidating these determinants, the research enhances our understanding and theoretical framework of bank profitability, particularly in the context of emerging markets and the unique circumstances presented by global crises.

1.7.2 Practical Significance

From a practical standpoint, this research has the potential to significantly impact the banking profession and the formulation of strategies to address practical challenges. The findings could inform policy decisions within the financial sector, guiding the development of initiatives aimed at improving bank performance and resilience. Additionally, by aiding the Bank of Zambia in identifying the key drivers of bank profitability, the study supports the creation of more effective regulatory frameworks. For banking executives and managers, the insights provided by this research emphasize the importance of managing identified variables, offering actionable strategies to enhance bank performance and sustainability.

1.7.3 Research Significance

The significance of this research within the academic domain can be viewed through three lenses: *continuation, extension, and new inquiry*. Firstly, it continues the exploration of bank

profitability by examining the Zambian context, thereby adding to the ongoing dialogue within financial research. Secondly, it extends previous studies by incorporating the effects of the COVID-19 crisis on bank profitability, offering a timely perspective on how global crises can impact financial institutions. Lastly, the study opens avenues for new inquiry by highlighting areas within bank management and regulatory practices that warrant further investigation, thereby encouraging subsequent research that can build upon its findings.

1.8 Scope of the study

The focus of this study was limited to examining the relationship between the profitability of Zambian-owned banks and their determinants during the period from 2013 to 2021.

1.9 Conceptual Framework

There are many measures that can be used to determine bank profitability. Return on assets (ROA) was used as a proxy of profitability (Bansal et al., 2018). Other researchers also use ROA to measure bank profitability (Garcia & Trindade, 2019). In addition, there are other measures such as the net interest margin ratio (Fidanoski et al., 2018) or net interest margin (Menicucci & Paolucci, 2016). Other empirical evidence states that profitability can be measured by ROE or return on equity (Saif-Alyousfi & Saha, 2021).

The factors that influence profitability of banks have also become an interesting study because there are still mixed results. Bank size is one of the predictors that will affect the level of profitability. Based on the existing literature and banking related concepts, we develop the conceptual framework.

In this study, we used measures of profitability as the dependent variable. All the variables identified for the study are summed up into two types of independent variables; The Bank Specific factors. The Relationships that exist among the variables is shown in the conceptual framework

below;

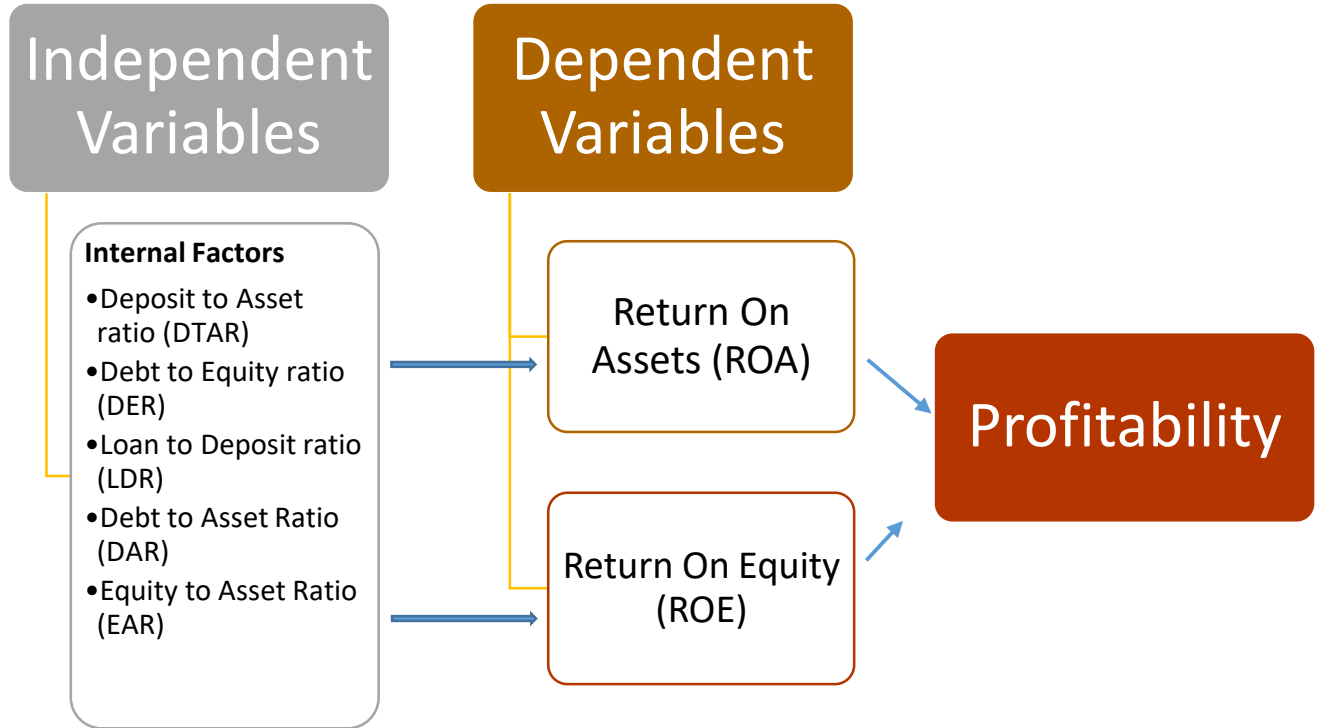


Figure 1: Conceptual Framework

Source: Authors Own Design.

Variables	Measurement	Source of data collection	References
Profitability indicators			
Return on asset	ROA% = Net profit after tax/total assets	Bank scope	Athanasoglou et al., <u>2008</u> ; Masood and Ashraf, <u>2012</u> ; Francis, <u>2013</u> ; Perera et al., <u>2013</u> ; Noman et al., <u>2015</u>
Return on equity	ROE% = Net profit after tax/ total equity	Bank scope	

Table 3: Description of dependent variables.

Source: Authors' own explanations.

Variables	Measurement	References
Banks' specific factors		
Date-to-asset ratio	DAR% = Total liabilities/Total assets	Gazi et al., <u>2021a</u>
Equity-to-asset ratio	EAR% = Total equity/Total assets	Staikouras and Wood, <u>2004</u>
Loan-to-deposit ratio	LDR% = Total loans/Total deposits	Menicucci and Paolucci, <u>2016</u> ; Regehr and Sengupta, <u>2016</u>
Deposit-to-asset ratio	DTAR% = Total deposit/Total assets	Rahaman and Akhter, <u>2015</u>
Debt-to-equity ratio	DER% = Total Liabilities/Total equity	Pradhan and Khadka, <u>2017</u>

Table 4: Description of independent variables.

Source: Authors' own explanations.

The above Objectives in 0 can be summarized as follows;

1. To assess the impact of *Bank Specific* on the profitability of selected Zambian-owned banks Pre and during COVID-19 ERA.

CHAPTER TWO: LITERATURE REVIEW

The preceding chapter outlined the study's background, problem statement, objectives, hypotheses, scope, and significance. This chapter delves into the literature pertaining to bank profitability, structuring the review into two main sections. The initial section explores the theoretical underpinnings of the study, including an overview of Zambia's banking industry, the economic importance of banks, and the determinants of bank performance. The subsequent section reviews empirical research on commercial bank performance, encompassing studies focused on individual countries as well as comparative analyses across multiple countries.

2.1 Overview of Banking in General

2.1.1 What is a Bank?

Banks hold a pivotal role as critical financial institutions within the economy, operating as fundamental businesses in thousands of communities, from small towns to bustling cities. Their influence is integral to the economic development of a nation, helping to strengthen the overall financial fabric of various sectors. This vital role encompasses supporting the growth of trade, commercial activities, and the industrial sector, which are the backbone of economic infrastructure.

The term "bank" has its etymology rooted in languages such as Latin ("Bancus"), French ("Banque"), and Italian ("Banca"), all referring to a bench or table used by money lenders and exchangers in marketplaces for the transactions of lending, exchanging, and handling money or coins. This historical context underscores the foundational role of banks in facilitating financial transactions and services that have evolved significantly over centuries.

Zambia, a small, landlocked country characterized by its modest per capita income of less than \$650, presents a unique context for the banking sector. Despite the challenges of literacy, with a significant portion of the Zambia's population unaware of banking services and their importance, banks play a crucial role in enhancing the economic scenario. By promoting better utilization of monetary resources and channeling the savings of the populace into productive sectors, banks are instrumental in fostering economic growth and development. Moreover, their services extend support to various government initiatives, further underlining their indispensable role in the national economy.

The concept of banking and the role of a banker have been subjects of analysis and definition by various scholars. One notable definition comes from Geoffery Crowther, who articulated that, “A banker is a dealer in debt, his own and others'. The essence of the banking business is to accept the debts of other people in exchange for his own, thereby creating money.” (Crowther, G., "An Outline of Money," p.417). This definition captures the essence of banking - the transformation and management of debt, which is central to the creation of money and the facilitation of financial transactions in the economy.

The multifaceted role of banks extends beyond the basic understanding of deposit and loan services. They are key players in the mobilization of resources, facilitating the flow of funds from savers, who have excess funds, to borrowers, who require funds for various purposes. This intermediary role is crucial for the efficient allocation of resources, which in turn drives economic development and growth. By pooling the savings of individuals and entities, banks can invest in a diversified portfolio of assets, mitigating risks and ensuring the availability of funds for investment in productive ventures.

Moreover, banks are instrumental in the development of the financial markets, providing various financial instruments and services that cater to the diverse needs of their clients. These services include, but are not limited to, savings accounts, loans, mortgages, and investment products. Through these offerings, banks facilitate financial inclusivity, enabling individuals and businesses to participate in the economic system, access credit, and invest in opportunities that contribute to wealth creation and economic stability.

The role of banks in supporting entrepreneurship and innovation cannot be understated. By providing financial resources and advisory services to start-ups and established businesses, banks play a crucial role in fostering a conducive environment for innovation and economic diversification. This support is vital for the creation of jobs, the development of new products and services, and the stimulation of economic growth.

Furthermore, banks contribute to the stability of the financial system through prudent risk management practices and adherence to regulatory standards. By managing risks associated with lending and investment activities, banks ensure their own stability and the stability of the broader financial system. This is critical for maintaining confidence among depositors, investors, and the public, which is essential for the smooth functioning of the economy.

In the context of Zambia, the banking sector faces unique challenges and opportunities. Given the country's geographical constraints and the disparities in financial literacy among its population, banks have a significant role to play in promoting financial inclusion and literacy. By extending their services to underserved and rural areas through traditional branches and digital banking platforms, banks can reach a wider segment of the population, facilitating access to financial services and contributing to the reduction of poverty and economic inequality.

The potential for banks to impact the economic development of Zambia is vast. Through initiatives aimed at enhancing financial literacy, supporting small and medium enterprises (SMEs), and investing in sectors that have a high potential for growth and job creation, banks can play a transformative role in the economy. Additionally, by adopting sustainable banking practices, they can contribute to the achievement of broader social and environmental goals, aligning their operations with the principles of sustainable development.

The role of banks in the economy extends far beyond their traditional functions of accepting deposits and extending loans. As critical financial institutions, banks are central to the mobilization of resources, the development of financial markets, the support of entrepreneurship and innovation, and the promotion of financial stability and inclusivity. In the context of Zambia, the banking sector has the potential to be a catalyst for economic development, offering solutions to the unique challenges faced by the country and contributing to its growth and prosperity. The evolution of banking services, coupled with a commitment to sustainable and inclusive financial practices, will continue to be vital for the economic development of nations worldwide.

2.1.2 History of Banking

The history of banking is extensive and complex, reflecting the evolution of finance, trade, and economy across different civilizations and epochs. Banking, in various forms, has been integral to economic systems for thousands of years, evolving from simple loan systems in ancient cultures to the sophisticated global banking network we know today. This historical overview outlines key developments in the history of banking, underpinned by references to scholarly sources and historical records.

Ancient Beginnings

The origins of banking can be traced back to ancient civilizations. In Mesopotamia, around 2000 BCE, the temples and palaces of Sumer were centers for the storage of grains and other commodities, serving as an early form of banking. This system facilitated agricultural loans and credit, crucial for the economy of the time (Hudson, 2004).

Classical Antiquity

In classical antiquity, banking activities became more sophisticated. Ancient Greece and Rome developed banking practices, including money lending, currency exchange, and the holding of deposits. In Rome, argentarii (bankers) played a vital role in managing financial transactions, both for the state and for private individuals (Andreau, 1999).

Medieval Banking

The medieval period saw the rise of merchant banks in Italy, particularly in cities like Florence, Venice, and Genoa, in the late middle Ages. These banks were involved in financing international trade, including the issuance of bills of exchange, lending, and currency exchange, marking the beginning of modern banking practices (De Roover, 1948).

The Emergence of Modern Banking

The 17th and 18th centuries saw significant developments in banking, with the founding of the Bank of England in 1694, which began as a private institution acting as a banker to the government. This period also saw the emergence of central banks in other European countries, laying the groundwork for the modern central banking system (Quinn, S., & Roberds, W., 2007).

The 19th to 21st Centuries

The 19th century was marked by the expansion of banking in the United States, with the establishment of the Federal Reserve System in 1913, which provided a central banking framework to oversee monetary policy and regulate banks. The 20th century witnessed further evolution, with the introduction of computer technology in the 1960s, revolutionizing banking operations and leading to the development of electronic and online banking in the late 20th and early 21st centuries (Bátiz-Lazo, 2018).

The history of banking reflects the growth and complexities of economies worldwide. From ancient grain loans to digital banking, this institution has continuously evolved, shaping and being shaped by the economic and social landscapes of its time. The cited works provide a deeper exploration into each era's unique contributions to the development of banking as a cornerstone of financial systems globally.

2.1.3 Types of Banks

Banks play a vital role in the world's economic systems, offering a wide array of financial services to individuals, businesses, and governments. They are classified into various types based on their functions, clientele, and operational focus. Understanding these different types of banks helps in appreciating the breadth of services available and how different sectors of the economy are supported. Here's an overview of the primary types of banks:

1. Retail Banks

Retail banks are the most common type of banks that the general public interacts with. They provide banking services to individual consumers and small businesses rather than to large corporations or other banks. Services offered include checking and savings accounts, personal loans, mortgages, credit cards, and safe deposit boxes. Retail banks are accessible to the general public and are focused on meeting the financial needs of individual customers.

2. Commercial Banks

Commercial banks cater to the needs of businesses and corporations, offering services like business loans, asset management, and savings accounts. They play a crucial role in providing credit for the commercial sector, thereby facilitating business operations, expansion, and economic growth. Some commercial banks also offer retail banking services, making them full-service banks. The commercial bank is where most people do their banking; as opposed to an investment bank. The general role of commercial banks is to provide financial services to general public and business, hence ensuring economic and social stability and playing pivotal role for sustainable growth of the economy.

The first function of the Commercial banks is that it accepts various types of deposits from public especially from its clients, including saving account deposits, recurring account deposits, and fixed

deposits. These deposits are returned whenever, the customer demands it or after a certain time period. Next, Commercial banks provide loans and advances of various forms, including an overdraft facility, cash credit, bill discounting, money at call etc. They also give demand and term loans to all types of clients against proper security. In most countries commercial banks are heavily regulated and this is typically done by a countries central bank. In Zambia, the commercial banks are regulated by the Bank of Zambia. They will impose a number of conditions on the banks that they regulate such as keeping bank reserves and to maintain minimum capital requirements.

Commercial banks can play a vital role in giving a direction to economic development by financing the requirement of trade and industries in the country. They draw the community saving into organized sector that can then be allocated among the different economic activities according to the priorities laid down by planning authorities in the country.

In ordered to collect the saving and put them into productive channels, financial institutions like banks are a necessity. In the absence of such institutions, the saving will not be safely and profitably utilized within the economy and will either be diverted abroad or used for unproductive consumption or speculative activities.

Due to increasing competition banks are forced to innovate new products to their customer and they are also shifting from traditional service procedure to various sophisticated services like Automatic Teller Machine (ATM) card , debit card, housing loan ,educational loan, vehicle financing.

3. Investment Banks

Investment banks specialize in large and complex financial transactions such as underwriting, acting as intermediaries in mergers and acquisitions, and facilitating the issuance of securities. They provide strategic advice to companies and governments on how to meet their financial goals and grow their finances. Unlike retail and commercial banks, investment banks do not accept deposits.

4. Central Banks

Central banks are national institutions that manage a country's currency, money supply, and interest rates. They oversee the banking system of their country and act as the bank of last resort in times of financial crisis. Central banks also implement monetary policy to control inflation, unemployment, and the overall stability of the financial system. Examples include the Federal Reserve System (the Fed) in the United States, the European Central Bank (ECB) in the Eurozone, and the Bank of England in the United Kingdom.

5. Cooperative Banks

Cooperative banks are owned and operated by their members, with profits being returned to members in the form of lower borrowing costs or higher savings rates. These banks provide their members with a wide range of banking and financial services. Cooperative banks are prevalent in rural areas and often focus on agricultural financing, but they also serve urban areas, focusing on personal banking and small-scale businesses.

6. Savings and Loan Associations

Savings and loan associations (S&Ls) specialize in savings accounts and mortgage loans but may offer other services found in retail banks. They were traditionally established to provide homebuyers with access to mortgages but have since broadened their services.

7. Credit Unions

Credit unions are not-for-profit organizations that provide many of the same services as retail banks but are owned by their members, who are also their customers. Credit unions typically offer higher savings rates and lower loan rates compared to traditional banks. Membership is often based on commonalities such as working in the same industry or living in the same geographic area.

8. Development Banks

Development banks are government or internationally funded agencies that provide financial support for large infrastructure projects, economic development, and poverty reduction projects in developing regions. They offer long-term capital for economic development projects that are deemed critical for the development of a region or a country. Examples include the World Bank, the Asian Development Bank, and the African Development Bank.

9. Online Banks

Online banks operate exclusively on the internet without any physical branch network. They offer traditional banking services but often with lower fees and higher interest rates on deposits due to lower overhead costs. Online banks have grown in popularity due to their convenience and competitive offerings.

Each type of bank plays a specific role in the financial system, catering to different segments of the economy or offering specialized services. Together, they form a comprehensive financial network that supports economic development, manages financial risks, and provides individuals and businesses with the financial tools necessary for growth and stability.

2.1.4 Importance of Banking

The significance of banking in the contemporary economic landscape cannot be overstated. As the backbone of financial stability and economic growth, banks play a pivotal role in the mobilization of resources, facilitation of transactions, and fostering of innovation. This essay delves into the multifaceted importance of banking, covering its role in economic development, financial stability, globalization, and societal welfare.

Economic Development and Growth

Banks are crucial catalysts for economic development. By accepting deposits and providing loans, they facilitate the flow of money within the economy, ensuring that financial resources are allocated efficiently. This process not only supports businesses by providing them with the necessary capital to invest and grow but also aids individuals in achieving their financial goals through loans and mortgages.

The relationship between banking and economic growth is symbiotic. A robust banking sector can enhance economic growth by improving the allocation of capital, which in turn leads to more efficient production and distribution of goods and services. Moreover, banks contribute to the creation of a more inclusive financial system by extending credit to underserved sectors of the economy, such as small and medium-sized enterprises (SMEs) and individuals with limited access to financial services.

Financial Stability

Banks are central to the stability of the global financial system. They manage risk through the diversification of their asset portfolios and by acting as intermediaries in the financial markets. Through these activities, banks help to mitigate the impact of financial shocks and contribute to the overall resilience of the economy.

Regulatory frameworks and banking policies, such as the Basel Accords, have been developed to ensure that banks maintain adequate capital and liquidity levels. These measures are designed to prevent bank failures that can lead to systemic crises, safeguarding the economy and protecting depositors' interests.

Support for Innovation and Technological Advancement

Banking institutions are at the forefront of adopting and implementing new technologies, which drives innovation across the financial sector. The rise of digital banking, mobile payment systems, and Fintech startups has revolutionized the way consumers and businesses interact with financial services, making transactions more convenient, faster, and often more secure.

By financing new business ventures and technological advancements, banks play a vital role in supporting economic innovation. This not only leads to the development of new products and services but also promotes efficiency and productivity growth across various sectors of the economy.

Globalization and International Trade

Banks facilitate international trade by providing a range of services, including foreign exchange transactions, international payment processing, and trade finance. These services are essential for businesses that operate across borders, enabling them to manage currency risk, finance export and import activities, and navigate the complexities of international markets.

Moreover, the global presence of multinational banks supports economic integration and the flow of capital across borders. This connectivity contributes to global economic stability by spreading risk and allowing for more efficient allocation of resources worldwide.

Enhancing Quality of Life and Economic Welfare

Beyond their economic functions, banks play a significant role in enhancing the quality of life and economic welfare of individuals. Savings and investment products offered by banks help people to manage their finances, plan for the future, and secure their retirement. Access to credit enables individuals to invest in education, healthcare, and housing, contributing to improved living standards and social mobility.

Banks also support community development through microfinance services, extending credit to individuals and small businesses in underserved communities. This not only aids in poverty reduction but also promotes gender equality by empowering women entrepreneurs.

The importance of banking in the modern economy extends far beyond its traditional roles of accepting deposits and extending loans. Banks are integral to economic development, financial stability, innovation, and the facilitation of international trade. They play a crucial role in improving the quality of life and promoting economic welfare across the globe.

As the financial landscape continues to evolve, the role of banks will undoubtedly expand and adapt to meet new challenges and opportunities. Ensuring the resilience, inclusivity, and integrity of the banking sector will remain essential for supporting sustainable economic growth and development in the years to come.

2.2 Overview of Banking in Zambia

2.2.1 History of Zambian Banking

The history and evolution of the banking sector in Zambia is a rich narrative marked by initial foreign dominance, government interventions, and a shift towards liberalization and increased competition. Standard Chartered Bank Zambia Plc, founded in 1906, was the first bank in the country, setting the stage for the financial sector's development. Throughout the colonial era and into independence in 1964, foreign banks like Barclays and ANZ Grindlays, alongside Standard Chartered, dominated the Zambian banking landscape. The government had planned in 1971 to nationalise the foreign banks by purchasing 51 per cent share holdings, but this plan was not implemented. (Brown bridge M, 1996).

After independence in 1964, the Zambian government adopted the import substitution industrialisation strategy as an economic development strategy. As part of this strategy, the

government of Zambia announced its desire to nationalise financial institutions except foreign commercial banks which dominated the industry (Brown bridge 1996; Harvey 1973). Part of the reason why foreign banks were spared was because the threatened to remove their management staff from Zambia, a move the Zambian government feared would compromise the industry. However, these foreign owned banks largely favored the expatriate community and foreign owned companies. In order to serve the interests of indigenous businesses and parastatal companies, the Zambian government established Zambia National Commercial Bank in 1969, which was fully owned by the government (Brown Bridge 1996).

To encourage local companies to borrow money at lower cost, the Zambian government pursued a policy of low interest rates between 1970s and 1980s periods. This resulted in economic distortions in the financial sector such as the huge foreign debt, which was necessitated by low interest rates in an economy that depended on foreign savings. Since inflation rates were high, real interest rates remained negative for the larger part of this period leading to low domestic savings and thus, the financial sector remained generally underdeveloped (Mankolo & Kasonde 2008).

During the 1970s and 1980s when the economy was dominated by state ownership, regulations governing the operations of the banking system were outdated leading to delinquent lending practices (Simpasa 2010). The poor state of banking supervision and prudential regulatory framework was the main cause of undercapitalization of the banking sector. This saw the capital-to-assets ratio fall below the internationally recommended threshold. Worse still, interest rate controls meant that banks could not adequately make allowance for loan maturity or risk.

Between 1980 and 1990, the spread between deposit and lending rates averaged 5% and both rates were negative in real terms because of the high inflation rate. Accordingly, prudence was weakened and by the early 1980s, banks had amassed huge non-performing assets due to non-repayment of loans by state enterprises whose investments were in commercially unsuccessful ventures (Simpasa 2010).

Several other banks and non-bank financial institutions were set up by the government to serve various purposes.

The Indo Zambia Bank was established in 1984 as a joint venture between the government and three state owned Indian banks, and in 1987 the Zambia Export and Import Bank was founded to supply trade finance. Development finance institutions were set up to provide concessional and/or long term finance to priority sectors with funds mobilised from the government or external sources. These included the Zambia Agricultural Development Bank and Agricultural Finance Company, which were amalgamated to form the Lima Bank in 1987, and the Development Bank of Zambia.

The liberalization of the financial sector saw an increase in the number of local private (non-government owned) banks. For example, between 1992 and 1996, 12 new commercial banks entered the market and by mid-1996, the number of local banks operating in Zambia had increased to 13 increasing the total number of banks to 26. The reason for this rapid increase in the number of banks between 1992 and 1996 was that the entry requirements such as real paid up capital were low (Simpasa 2010).

Despite their good intentions, most of the government policies and programs failed to create the financial system government envisioned as the financial system remained small and undiversified. Government involvement in the financial sector coupled with deteriorating macroeconomic conditions, resulted in an inefficient system. Only a few banks therefore entered the market between 1970 and 1990 as it was not profitable (Maimbo & Mavrotas 2003).

The regulatory authorities also imposed minimum nominal capital requirements for both domestic and foreign banks. However, these requirements did not have much impact because they were never revised even when inflation rates were high. Brown bridge (1996) argues that the reduction in real capital requirements affected the safety and soundness of the financial system.

Financial liberalisation, which was initiated in 1992, offered an opportunity for a revival of the Zambian banking industry. Mindful of the fact that a well-functioning and competitive financial system is critical to the country's overall economic development, several major obstacles in the banking sector were eliminated. This made it possible for new private banks to enter the sector with ease. The resulting competition from many banks improved efficiency in the sector (Simpasa 2010).

Barclays and Standard Bank retained significant shares of the banking market (approximately 20 per cent and 16 per cent respectively of total bank deposits in 1991) but their market share had been reduced by the growth of ZANACO, Meridien and other local banks. Both had nation-wide retail branch networks, although Standard Chartered Bank, in line with its global policy, is now retrenching in Zambia to concentrate on corporate and trade finance, and announced the sale of some of its branches to Finance Bank (a bank owned by local private sector investors) in 1995. Grindlays was purchased by Stanbic in 1992: it had a much lower market share and focuses on the corporate sector.

During the early 1980s two more foreign banks established subsidiaries in Zambia: Citibank, which has concentrated on corporate finance and Bank of Credit and Commerce International (BCCI). The latter - known as Bank of Credit and Commerce Zambia (BCCZ) - expanded rapidly by offering innovative services and attracting business from parastatals to capture 7.5 per cent of total bank deposits by 1989. It was purchased by Union Bank (another local private sector bank) in 1991 after its parent company was closed down.

Despite the bad experiences that banks had, the liberalization of the financial sector brought about an increase in competition mainly because of the stable macroeconomic conditions experienced since 2002. Inflation continued declining from 18.7% in 2001 to 8.9% in 2007 thereby leading to a decrease in lending rates or interest rates on loans. Further, banks were able to compete for the customer deposits and credit that has low risk of default (Mankolo & Kasonde 2008).

The performance of the banking sector between 2006 and 2008 was sound compared to the 1980s and early 1990s when there were several bank failures. When we measure performance of the banking sector, we mean positive performance of its key profit indicators such as Return on Assets and Return on Equity. During the 2006-2008 period, the financial sector was more profitable with positive growth in total assets, high liquidity ratios and better asset quality (BOZ 2008). Non - performing loans to total gross loans and advances reduced from 11.3% in 2006 to 8.8% in 2007. Total assets also grew by 24.4% between 2007 and 2008 (BOZ 2009b). The increase in profitability was a result of an increase in interest income arising from loan activities and non - interest income earned from deposits and other banking activities (BOZ 2008).

The performance of the financial sector during 2006-2008 described above protected it from the direct impacts of the global financial crisis (Silumbe 2010). The World Bank echoed similar sentiments and claimed that Zambia's resilience in domestic funding and limited exposure to external credit lines shielded the banking industry from the adverse effects of the global financial crisis (The World Bank Group 2008). Therefore, the global financial crisis did not affect the Zambian financial sector immediately or directly. This was mainly due to the sector's limited integration into the international financial markets. Further, the financial sector had no exposure to credit products from abroad, which led to the credit crunch in most developed markets. As noted in the introduction, internal factors and external factors affect banks profitability. In this case, it would be interesting to study how the external facts affect bank profitability. This research paper solely focused on understanding how the internal factors affect bank profitability.

However, the subsequent global financial crisis, with the global economic recession that followed, adversely affected Zambia, like most economies (BOZ 2009). The global financial crisis had noticeable impacts on credit markets and this was first observed in the third quarter of 2008. The bank lending rate increased gradually during the first and second quarters and rapidly during the fourth quarter (Manenga et al. 2009). The financial crisis also led to volatility in the local currency against major currencies and the depreciation of the local currency. The number of non-performing loans also increased as a percentage of total assets in the banking sector from 6% in mid-2008 to 13.1% by September 2009 (Manenga et al. 2009), thus, negatively affecting banks profitability.

Commercial banks in Zambia continue to show resilience to the changing financial and macroeconomic environment. This is mainly attributed to their strong capital position.

However, The International Monetary Fund (IMF) points out that the Zambian banking sector is concentrated with the top four banks' assets comprising 60% of total sector assets. Meanwhile, the loan-to-deposit ratio is around 65% and this confirms why the lack of bankable projects and borrowers is the main reason for limited credit delivery (IMF 2013). Statistics for other countries indicate a loan-to-deposit ratio of 58.1%, for Malawi (Reserve Bank of Malawi 2013), Tanzania had 71.4% in 2014 and increased in 75.5% in 2021 (Bank of Tanzania 2021) and Uganda had 42.5% (Bank of Uganda 2013).

The banking sector recorded improvements in the aggregate capital adequacy position, asset quality and liquidity position post the 2008 global financial crisis. The sector continued to expand also in terms of total assets and branch network (BOZ 2021). The ratio of total loans to non-performing loans also reduced from 8.1% in 2012 to 7.5% in 2013 (BoZ 2013). Compared to Zambia, the figures for other countries such as Malawi had capital ratios reduced from 16.3% to 16.2%, liquidity ratios increased from 45.4% to 58.1% and credit risk increased from 9.4 to 13.6. These changes are as a result of an increase in interest rates that saw a rise in non-performing loans (Reserve Bank of Malawi 2013). In Tanzania, we notice a similar trend to Zambia, the banking sector remained adequately capitalized with ratios increasing from 17.4% to 17.6% and the liquidity ratio increasing from 67.6% to 71.4%, while credit risk reduced from 7.4% to 6.5% (Bank of Tanzania 2014).

However, since the later part of 2015, inflation has been increasing and has continued to be in double digits. As at June, 2017, the inflation rate was 17.4%. This inflation rate that has caused interest rates to increase from 20.5% in 2014 to 23.9% in 2015. According to Bank of Zambia (BOZ 2021), inflation rate was 9% in 2019 and during the COVID 19 period, inflation rate increased to 16% in 2020. The year 2021 closed the rate at 22%, and this resulted in some commercial banks to halting issuance of loans due to an increase in non-performing loan (Lisulo 2016).

The dominance of foreign banks in the Zambian banking sector, particularly those subsidiaries of international banks, can be attributed to several factors. First, their global networks provide a competitive advantage in attracting multinational corporations operating in Zambia, as well as affluent and internationally mobile customers. These banks can offer a range of services, including international money transfers, foreign currency transactions, and access to global investment products, which are appealing to this segment of customers.

Second, foreign banks often have access to cheaper funding sources compared to their local counterparts. This is due to their parent companies' ability to raise funds at competitive rates in international financial markets. Such cost advantages allow foreign banks to offer loans at lower interest rates or with more favorable terms, making them more attractive to borrowers.

Third, the expertise and advanced technology brought by foreign banks contribute to their competitive edge. These banks often introduce innovative products and services to the market, setting new standards for banking in Zambia. Their investment in technology enhances operational efficiency and customer service, further differentiating them from local banks.

Despite the advantages held by foreign banks, the presence of locally owned private banks and government-owned banks plays a vital role in serving the broader Zambian population. These institutions often focus on segments of the market underserved by foreign banks, such as small and medium-sized enterprises (SMEs), low-income individuals, and rural populations. By catering to these groups, local and government-owned banks support financial inclusion and economic empowerment across different socio-economic classes.

The Zambian government and the Bank of Zambia (BoZ) have implemented various measures to foster a more inclusive and competitive banking sector. Regulatory reforms aimed at enhancing the financial infrastructure, including the establishment of credit reference bureaus, have improved the credit environment. This enables banks to better assess credit risk and extend credit to a broader range of borrowers, including those without a traditional credit history.

Furthermore, the BoZ's efforts to promote digital financial services have spurred innovation in the banking sector. The introduction of mobile banking and payment services has expanded access to financial services, especially in rural areas where traditional banking infrastructure is limited. These digital platforms provide a convenient and accessible way for individuals to conduct financial transactions, save, and access credit, thereby enhancing financial inclusion.

Looking ahead, the Zambian banking sector faces both challenges and opportunities. The ongoing global economic uncertainties and fluctuations in commodity prices, particularly copper, which is Zambia's main export, pose risks to economic stability and the banking sector. However, the country's economic diversification efforts and the expansion of sectors such as agriculture, manufacturing, and tourism present opportunities for banks to support new and emerging industries.

In conclusion, the Zambian banking sector has undergone significant transformation since the establishment of Standard Chartered Bank Zambia Plc. in 1906. While foreign banks continue to play a dominant role, the presence of local and government-owned banks ensures a diverse and

inclusive banking landscape. Regulatory reforms, technological advancements, and the promotion of financial inclusion have contributed to a more dynamic and resilient banking sector. As Zambia navigates the challenges of the global economy, its banking sector remains a pivotal force in supporting the country's development and economic aspirations.

2.2.2 Key Players in the Zambian Banking Sector

The landscape of banking in Zambia includes a mix of local banks, international banks, and specialized financial institutions that cater to various needs, from retail banking to corporate and investment banking.

- **Zanaco (Zambia National Commercial Bank):** Zanaco is one of the largest and most widespread banks in Zambia, with a strong presence across the country. It offers a variety of services including personal banking, business banking, and agricultural finance. Zanaco has been instrumental in promoting financial inclusion in Zambia.
- **Standard Chartered Bank Zambia:** As part of an international banking group, Standard Chartered Zambia offers a range of services including corporate and institutional banking, retail banking, and wealth management. It has a long history in Zambia and is known for its strong corporate banking services.
- **Barclays Bank Zambia (now part of Absa Group):** Barclays Zambia was rebranded to Absa Zambia as part of its parent company's rebranding across Africa. Absa offers comprehensive banking services including personal and business banking, credit cards, and investment products.
- **First National Bank Zambia (FNB):** FNB is part of the South African banking group FirstRand. It has made significant inroads in the Zambian market, offering innovative banking solutions and services tailored to both individuals and businesses.
- **United Bank for Africa (UBA):** UBA Zambia is part of a large African banking conglomerate with operations in many countries. It provides a wide array of banking services ranging from retail banking to corporate and treasury services.
- **Stanbic Bank Zambia:** A member of the Standard Bank Group, Stanbic Bank is a major player in Zambia's banking sector, offering services to individuals, small businesses, and large corporations. It has a strong focus on supporting the mining sector, agriculture, and other key industries in Zambia.

- **Ecobank Zambia:** Part of the Pan-African Ecobank chain, Ecobank in Zambia offers a broad spectrum of services including corporate banking, investment banking, and retail banking. It's known for its digital banking platforms.
- **Investrust Bank:** A locally owned bank that offers personal banking, business banking, and asset management services. Investrust has focused on expanding its digital banking services and improving access to banking across Zambia.
- **Development Bank of Zambia (DBZ):** Though not a commercial bank, DBZ plays a critical role in Zambia's financial sector by providing financing for development projects and businesses in various sectors such as agriculture, manufacturing, and infrastructure.

2.2.3 *Zambian Owned Banks*

In Zambia, the banking sector includes a mix of foreign, regional, and locally owned banks. Local ownership implies that the bank is owned by Zambian individuals or entities. Here are some of the locally owned banks operating in Zambia:

1. **Zanaco (Zambia National Commercial Bank Plc)** - One of the largest local banks, Zanaco was established in 1969 and has a significant presence across the country. While it was initially government-owned, it was partially privatized with the government still holding a stake. It offers a wide range of banking services to personal, business, and corporate clients.
2. **Atlas Mara Bank Zambia - Atlas Mara Co-Nvest Limited** acquired Finance Bank Zambia in 2016, rebranding it as Atlas Mara Bank Zambia. It provides a broad spectrum of financial services and products to both retail and corporate customers. Although Atlas Mara has a regional presence, its operations in Zambia are deeply rooted in the local market.
3. **Investrust Bank Plc** - A Zambian-owned commercial bank that offers retail and corporate banking services. Established in 1996, Investrust has grown to establish a nationwide footprint, serving individuals, small businesses, as well as large corporations.
4. **Cavmont Bank Ltd** - Before its merger with Access Bank Zambia, Cavmont Bank was another example of a locally owned bank. It was established in 2004 and offered a wide range of banking products and services tailored to meet the needs of its customers.

5. **Indo Zambia Bank** - A joint venture between the Government of the Republic of Zambia and the Government of India. Founded in 1984, it serves both retail and corporate clients, offering various financial products and services. Its unique ownership structure places it in a special category where it is locally incorporated but also has significant foreign government ownership.
6. **Zambia Industrial Commercial Bank Limited (ZICB)** - Established to focus on supporting industrial and commercial growth in the country, ZICB offers a range of banking services aimed at businesses and individuals. It's a relatively new player, demonstrating the government's initiative to foster a more inclusive financial sector.

Local ownership in the banking sector is crucial for several reasons. It ensures that financial policies and practices are aligned with the national economic goals and priorities, encourages retention of profits within the country, and often leads to more localized decision-making that takes into account the specific needs of the Zambian market.

2.2.4 Challenges and Opportunities in the Zambia Sector

The Zambian banking sector faces several challenges, including the need to enhance financial inclusion, the necessity for more rural banking services, and the impact of global economic fluctuations. However, there are also significant opportunities, particularly in leveraging technology to expand access to banking services, supporting the growth of small and medium-sized enterprises (SMEs), and financing key sectors like agriculture, mining, and renewable energy.

2.3 Bank Profitability

2.3.1 Introduction

Different types of banks have different purpose along with profitability. There are many factors influencing banks profitability with diverse ways. Aburime (2008) found that the significance of bank profitability can be judged at both micro and macro levels of the economy. At the micro level, profit is the essential prerequisite of a competitive banking institution and the cheapest source of funds. It is not merely a result, but also a necessity for successful banking in a period of growing competition on financial markets. Hence the basic aim of every bank management is to maximize profit, as an essential requirement for conducting business. At the macro level, a sound and profitable banking sector is better able to withstand negative shocks and contribute to the

stability of the financial system. Bank profits provide an important source of equity especially if re-invested into the business. This should lead to safe banks, and as such high profits could promote financial stability (Flamini et al., 2009).

However, too high profitability is not necessarily good. Garcia-Herrero et al. (2007) observed that too high profitability could be indicative of market power, especially by large banks. This may hamper financial intermediation because banks exercising strong market power may offer lower returns on deposit but charge high interest rates on loans. Too low profitability, in turn, might discourage private agents (depositors and shareholders) from conducting banking activities thus resulting in banks failing to attract enough capital to operate. Furthermore, this could imply that only poorly capitalized banks intermediate savings with the corresponding costs for sustainable economic growth.

There are many aspects of the performance of commercial banks that can be analyzed. This study focuses on the profitability performance of commercial banks in Zambia. The aim of this study is to seek the effects of size of commercial bank on profitability rather than other factors for its profitability performance. Due to the finding of this study, investors get clear cut idea for investing whether to small or large scale of firms. Even though many researchers were worked on the profitability in commercial bank of Zambia, very few researchers were reported about the bank effect size on profitability in different way. The bank size is one of the factors that measure the firms' profitability.

2.3.2 Measures of Bank Profitability

In general, in order to perform the analysis of banking units' profitability, the "DuPont" system is used as an analysis model based on the comparison between the profit of the banking company and the risk. The system quantifies both the bank's performance and its exposure using a set of specific indicators: Return on Assets, Return on Equity and Equity Multiplier. According to Borlea S. (2006), bankers pay special attention to the message sent to the stakeholders via an indicator-based analysis. In general, banks manage profitability by trying to exceed the market average and making sustained efforts to maintain a stable and predictable profit, a decision that has an impact on attracting new investors in the banking field. Thus, the profitability indicators prove to be an extremely useful tool kit.

However, the analysis of the information provided by them will be carried out only in close correlation with the other indicators assessing balance, management and risk, given that profitability indicators alone do not create a complete picture of the banking activity. That being said, there is a need to base the analysis of the banking performance "on a correlated system of indicators", of which Popa A. (2009) lists: net margin of bank's assets, net margin of interest-earning assets, Return on Assets, Return on Equity, overall profitability rate. A universally accepted model in bank profitability management and risk management is Asset and Debt Management, having as fundamental objective the "sustained increase in profitability" in order to maximize the capital reserves of the banking institution. Thus, for any bank its strength lies in the interest margin, which highlights, with the help of the results of the banking activity, the efficiency in obtaining them and implicitly the efficiency of its intermediation.

In the category of banking performance indicators, we also include the profitability rate, which is the expression of the profit obtained by the bank in its activity, and here we are talking about financial profitability (Return on Equity) or economic profitability (Return on Assets). According to Anghelache C. et al. (2018), economic profitability is a reflection of the effect of managerial capacity in terms of the use of the financial resources in order to obtain profit by the bank, under the conditions of the evolution plan and program of measures. Another important indicator in the assessment of the banking performance is the Equity Multiplier, whose action takes place in the context in which the use of new resources brings superior advantages or at least equal to the Return on Assets.

Many researchers compared the ROE in their work. Though there are similar works, but in the present work, sizes of different banks are classified and compare their ROE mean using statistical tools to formulate sound. The fluctuation of ROE based on capital also studied in this study. This is the indication factors for investment on their own risk.

Studies made on the performance of banks largely used Return on Assets (ROA) and Return on Equity (ROE) (Ezra, 2013).

Return on Asset (ROA)

The Return on Assets (ROA) reflects the ability of a bank's management to generate profits from the bank's assets. It shows the profits earned per value of assets and indicates how effectively the

bank's assets are managed to generate revenues, although it might be biased due to off-balance-sheet activities. This is probably the most important single ratio in comparing the efficiency and operating performance of banks as it indicates the returns generated from the assets that bank owns (Tan al. 2012).

ROE measures the return (per percentage) of shareholders' investment. The higher the return, the higher the dividends the management can pay. In addition, a rising return on equity provides the support for future return increases. The rate of Return on Assets is calculated according to the formula:

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

Equation 1: Return on Assets

The Return on Assets is obtained by dividing net income by total assets (usually at average value). The indicator measures the percentage of return on a monetary unit of asset. As an analysis model, the following aspect can be mentioned: the higher the ROA, the better the bank's profitability. The ROA indicator's values vary among banks, largely due to differences in the level of the commissions. ROE is linked to ROA through a bank's Equity Multiplier (EM), which is equal to the total assets divided by shareholders' equity. EM measures the bank's financial leverage ratio or the amount of its debt compared to equity. The higher the aggregate liabilities, the greater the financial leverage ratio and EM.

EM = Total Assets / Shareholder's Equity.

Equation 2: Equity Multiplier

Return on Assets compares the value of a business's assets with the profits it produces over a set period of time. Return on assets is a tool used by managers and financial analysts to determine how effectively a company is using its resources to make a profit. It's simple to calculate ROA, as we saw above: Divide a company's net profit by its total assets, then multiply the result by 100.

$$Return\ on\ Assets = \frac{Net\ Profit}{Total\ Assets}$$

Equation 3: Return On Assets

ROA is a helpful metric for gauging a single company's performance. When a firm's ROA rises over time, it indicates that the company is squeezing more profits out of each dollar it owns in

assets. Conversely, a declining ROA suggests a company has made bad investments, is spending too much money and may be headed for trouble.

We should be very cautious about comparing ROAs across different companies, however. ROA is not a useful tool for comparing different sized companies or companies that aren't in similar industries. Expected ROAs might vary even among companies of the same size in the same industry, but are at different stages in their corporate lifecycles.

For these reasons, it's best to use ROA as a way to analyze a single business over time. Plotting out the ROA of a company quarter over quarter or year over year can help you understand how well it's performing. Rising or falling ROA can help you understand longer-term changes in the business.

ROA is the widely used and key ratio of gauging bank's profitability (Tan, 2016). This ratio supports banks to understand the capability to invest and use financial resources to make a profit.

Return on Equity (ROE)

The Return on Equity (ROE) model is a well-known approach used in analyzing a bank's results using financial statements. This model uses elements both from the balance sheet and from the profit and loss account (Geruning, Brajovic, 2004). The comparison is made for the same banking institution at different time frames or is used to compare the bank to its rivals or to the average of the banking system. Thus, the banks from the same banking system / geographical area are compared with each other, being contenders. The system's average is a useful benchmark for the comparisons, and also for risk assessment. Obviously, the reference periods are identical for the balance sheet data and for those extracted from the profit and loss account. For an accurate image, it is preferable to use average balance data so as to eliminate distortions that may occur at the beginning or end of a period. .

Return on Equity (ROE) is the return to shareholders on their equity. This means ROE reflects the capability of a bank in utilizing its equity to generate profits (Tan et al. 2012). According to Dietrich et al. (2009), banks with a lower leverage ratio (higher equity) report a higher ROA, but a lower ROE. However, the ROE disregards the higher risk that is associated with a higher leverage. Even if ROE is commonly used in different studies, it is not the best measure of

profitability (Ghazouani et al. 2013). Despite this fact, this study used both ROE and ROA as measures of profitability to get balanced results.

Return on Equity (ROE) flouts the risks allied with financial leverage and height leverage is habitually resolute by regulations. It denotes a bank's profit generated by the amount invested by its shareholders (Olorunniwo Et al 2006). ROE is important to calculate to see how the bank management is using shareholder funds. ROE assists quantity a bank's ability to use investment funds to increase earnings

This expansive review of the literature seeks to explore the determinants of bank profitability, aiming to uncover gaps in existing research and highlight the novel contributions of this study. Understanding bank profitability is critical, as it impacts not only the financial health and sustainability of the banks themselves but also the broader economic environment in which they operate. The profitability of banks is a multifaceted issue, influenced by a combination of internal and external factors. This review dissects these factors, drawing on a wide array of empirical studies, to better grasp how various elements affect bank profitability.

2.3.3 Internal Determinants of Bank Profitability

The literature commonly distinguishes between internal (micro or bank-specific) and external determinants of bank profitability. Internal determinants stem from a bank's own operational data, including its balance sheet and profit and loss accounts. These can encompass factors like capital adequacy, asset quality, and management efficiency. External determinants, on the other hand, relate to the broader economic, regulatory, and legal environments in which banks operate. These include economic growth rates, interest rates, regulatory frameworks, and the competitive landscape.

Empirical studies have often found that internal factors play a significant role in explaining bank profitability but acknowledge that external factors also wield considerable influence. For instance, the regulatory environment, though having a less direct impact, shapes the operational landscape of banks and can thus affect their profitability. Studies exploring the impact of regulations (Barth et al., 2003; 2004) report mixed evidence on whether bank supervisory structures and regulations have a significant effect on bank profits.

Bank Size (BS)

One of the most discussed characteristics influencing bank profitability is bank size, typically measured by total assets. The relationship between bank size and profitability, however, remains a contentious issue within the academic literature. Studies such as those conducted by Demirgüç-Kunt and Huizinga (1999), Dietrich and Wanzenried (2009), and Sufian and Habibullah (2009) suggest a negative correlation, proposing that larger banks might suffer from inefficiencies that detract from their profitability. Conversely, research by Afzal and Mirza (2010), Aljbiri (2013), and Sahyouni and Wang (2018) presents a counter-argument, showing a positive effect where larger bank size is associated with higher profitability. This discrepancy in findings points to a complex relationship between bank size and profitability, indicating that other factors might mediate or moderate this relationship.

The size of a business means the ability it possesses, the variety and number of production capability or the quantity and multiplicity of services or business it can offer concomitantly to its customers. In a simpler way, the best indication of bigness of a firm is the size of its management group or the amount of assets it possesses compared to others in the same industry (Sritharan, 2015).

Size is commonly measured by gross sales or gross value of assets, logarithm of total assets, number of employees and sales turnover. Growth in size of a firm can be in terms of revenue, profits, assets or number of employees which are all essential for increased financial health and profitability. This study aims at identifying whether the increase or decrease in size of commercial banks asset has any influence on the bank profitability.

Firm size has been remarkably considered as an important determinant of firm profitability. Larger firms are said to be able to produce goods more cheaply as compared to small firms. This is because the former have achieved more learning, greater cumulative experience and they are able to spread their fixed costs over a greater amount of production (Kigen, 2014).

In existing literature, size has been considered as a fundamental variable in explaining firm profitability by and a number of studies on the relationship between these two conclude that impacts of size on profitability can be negative or positive. Results by Mule, Mukras and Nzioka (2015), indicated that there is a positive significant relationship between firm size and profitability,

that is, return on equity, implying that a unit change in firm size leads to an increase in return on equity of firms. Contrarily, some authors claim that size may have no or negative impacts on profitability. Shepherd (1972) found that growth in size causes a diseconomies of scale whereas Niresh and Velnampy (2014), had results showing that firm size has no profound impact on profitability of firms.

Redmond et al. (2007) studied about the effect of bank size on profitability. They were categorized banks into 5 categories according to their size of assets, the ROE ratio is used as a measure of profitability, and found that, there is a negative significant relationship between profitability and the volume of assets.

Nevertheless, few of these studies have tested the relationship between profitability and different bank size categories. Halkos and Salamouris (2004) investigated the effect of bank assets on its efficiency, they concluded from their study about Greek banks that, the higher the bank assets the higher the efficiency. Similar results were found in European banking sectors through a study of Bikker (1999). In contrast, results were shown by Darrat & Yousif (2002) in the case of Kuwait, to those who found a negative relationship. Haron (2004) proved that, size has no significant effect on profitability measured by ROA. On the other hand, the results that reached to by Hassan & Bashir (2003) proved that, size has a negative relationship on profitability.

Deposit to Asset Ratio (DTAR)

According to Kwan (2000), deposits to asset ratio measures the magnitude of assets being funded by public deposits. He further stated that the Deposit-to-Asset Ratio tests whether banks that have more deposits incur additional operating costs to attract deposits. In the context of Banks, deposits to assets ratio measures the relative portion of the banks total assets that is funded by deposits and gives an informed analysis of the role of deposits as a funding source (Mix Market, 2011).

The Deposit to Total Asset Ratio (DTAR) is a critical metric in the banking sector, serving as a significant indicator of a bank's operational efficiency, risk profile, and overall profitability. This ratio, calculated by dividing a bank's total deposits by its total assets, sheds light on the bank's funding structure and its reliance on deposits for financing its assets. In exploring the Deposit to Total Asset Ratio as a measure of bank profitability, it is essential to delve into the intricacies of banking operations, the impact of this ratio on a bank's financial health, and how it correlates with

profitability. This analysis will draw upon various academic sources, empirical studies, and theoretical frameworks to provide a comprehensive understanding of DTAR's role in assessing bank profitability.

Bank profitability is influenced by a myriad of factors, ranging from macroeconomic conditions to internal operational efficiencies. Among these, the Deposit to Total Asset Ratio holds a unique place as it encapsulates both the funding strategy of a bank and its ability to leverage deposits into profitable ventures. The essence of banking revolves around the transformation of deposits into loans and other assets; thus, understanding the dynamics of DTAR is paramount for analyzing a bank's profitability (Rose and Hudgins, 2013).

The banking business model is fundamentally based on the concept of financial intermediation, where banks accept deposits and extend loans. The Deposit to Total Asset Ratio is instrumental in this model, as it indicates the proportion of a bank's assets financed by customer deposits, as opposed to other sources such as equity or wholesale funding. A higher DTAR suggests a greater reliance on deposits for financing assets, which is traditionally viewed as a cost-effective funding source due to lower interest rates compared to other forms of borrowing (Koch and MacDonald, 2003).

According to Helms (2007), deposits are viewed as cheaper alternatives to funding and as such deposits are deemed to bring down the cost of operations in the process increasing profitability and in effect the Banks sustainability. Deposit to assets ratio will only be relevant to Banks that mobilize deposits in this study. According to Muriu (2011), the lower the ratio, the greater is the Bank's capability to fund its assets base from deposits.

Total Deposit to-Total Assets Formula

The total deposit-to-total assets formula is the quotient of total deposit divided by total assets. As shown below;

$$DTA = \frac{\text{Total Deposit}}{\text{Total Assets}}$$

Equation 4: Deposit To Asset Ratio (DTA)

This calculation generally results in ratios of less than 1.0 (100%). A proportionally larger deposit base as a percentage of total assets will typically lead to an overall lower cost of funds, assuming that the deposits program is cost efficient in its operational and financial expense of deposits ratios. The higher the ratio, the more the banks must rely on external funding, which is often a more costly source of funding than deposits. Banks may also effectively use local depositors as in the case of Irish loan funds (Hollis, & Sweetman, 2007) not just for funding, but also because of the important discipline that depositors can impose on expenses management—which has an impact on profitability and financial sustainability. Muriu (2011) found a positive significant relationship between deposits to assets ratio and Banks sustainability.

DTAR and Bank Profitability: An Empirical Perspective

Interest Margin Impact

The DTAR directly impacts a bank's interest margin, which is a critical component of bank profitability. Banks with a higher ratio of deposits to total assets tend to have lower funding costs, as deposits are generally less expensive than alternative funding sources. This can lead to a higher net interest margin if the bank effectively lends these deposits at higher interest rates. Saunders and Cornett (2006) highlight that the composition of a bank's assets and its funding strategy significantly influence its interest income and overall profitability.

Risk Management

The ratio also has implications for a bank's risk profile. A high DTAR indicates a reliance on deposits, which are considered stable funding sources but are subject to withdrawal risks. Banks must carefully manage this liquidity risk to ensure profitability. Diamond and Dybvig's (1983) model of bank runs underscores the importance of maintaining an optimal level of liquidity to prevent solvency issues that could erode profitability.

Operational Efficiency

Operational efficiency is another aspect through which DTAR influences profitability. Banks that efficiently convert deposits into earning assets typically exhibit higher profitability. This operational aspect emphasizes the role of asset management and the quality of a bank's loan

portfolio in determining its profitability. Berger and Mester (1997) argue that operational efficiency, including effective deposit utilization, is a key determinant of bank performance.

Regulatory and Economic Considerations

The regulatory environment and macroeconomic conditions play pivotal roles in shaping the relationship between DTAR and bank profitability. Basel III regulations, for instance, introduced stricter liquidity and capital requirements, affecting banks' deposit strategies and profitability (Basel Committee on Banking Supervision, 2010). Furthermore, the economic climate influences deposit levels and asset quality, directly impacting DTAR and profitability. The global financial crisis of 2008 is a testament to how rapidly changing economic conditions can affect banks' funding structures and profitability (Acharya and Mora, 2015).

Case Studies and Sectoral Analysis

Empirical studies across different banking sectors and regions have shown varying impacts of DTAR on profitability. For example, research on European banks has indicated that those with higher DTARs tend to exhibit better profitability metrics, attributed to the lower cost of deposit-based funding compared to other sources (Demirgüç-Kunt and Huizinga, 2010). Conversely, studies in emerging markets suggest that while a higher DTAR indicates lower funding costs, the correlation with profitability can be moderated by factors such as asset quality, market competition, and macroeconomic stability (Naceur and Omran, 2011).

The Deposit to Total Asset Ratio is a multifaceted indicator, influencing bank profitability through various channels including interest margins, risk management, and operational efficiency. While a higher DTAR can signal cost-effective funding and potential for higher profitability, it also necessitates prudent liquidity management and operational efficacy to translate into sustained earnings. Banks must navigate the delicate balance between leveraging deposits for asset creation and maintaining sufficient liquidity to meet withdrawal demands.

Moreover, the regulatory landscape and economic environment significantly influence the dynamics of DTAR and its impact on profitability. In light of this, banks need to adopt a strategic approach to deposit management, aligning their DTAR with broader financial stability and profitability objectives. Future research could further elucidate the complex interplay between DTAR, regulatory changes, and technological advancements in banking.

He attributed these results to the fact that a proportionally larger deposit base will typically lead to an overall lower cost of funds for the Banks with an implication of improved profitability and consequently financial sustainability —assuming that the deposits program is cost efficient.

This is important as it would also broaden the lending capacity of Banks. These results are however contrary to García-Herrero, (2009) who do not find significant results in the Chinese banking industry. However, Bogan (2009) found a negative relationship between deposits to assets ratio and financial sustainability. This could have been attributed to the lack of experience in deposit taking and the high costs associated with transformation.

In conclusion, the Deposit to Total Asset Ratio is a crucial metric for assessing bank profitability, encapsulating the efficiency of deposit utilization, risk management strategies, and the impact of external factors on a bank's financial performance. Understanding and optimizing DTAR can provide banks with a competitive edge, enabling them to navigate the challenges of the financial sector and achieve sustainable profitability.

Debt to Equity Ratio (DER)

The debt-to-equity ratio (D/E ratio) shows how much debt a company has compared to its assets. It is found by dividing a company's total debt by total shareholder equity. A higher D/E ratio means the company may have a harder time covering its liabilities. The Debt to Equity (D/E) ratio, a critical financial metric, offers insight into a company's capital structure by comparing its total liabilities to shareholder equity. While this ratio is extensively used across various sectors to gauge financial health and risk, its application and implications for bank profitability necessitate a nuanced understanding, especially given the unique operational and regulatory environment in which banks operate.

Understanding the Debt to Equity Ratio

The D/E ratio is calculated by dividing a company's total liabilities by its shareholder equity. This metric helps investors and analysts understand how a company is funding its operations and how capable it is of meeting its financial obligations with owned capital. A higher D/E ratio indicates that a company is primarily financed through debt, which can be a sign of financial leverage but also of potential financial vulnerability.

Formula and Calculation of the D/E Ratio

The information needed to calculate the D/E ratio can be found on a listed company's balance sheet. Subtracting the value of liabilities on the balance sheet from that of total assets shown there provides the figure for shareholder equity, which is a rearranged version of this balance sheet equation:

$$\text{Assets} = \text{Liabilities} + \text{Shareholder Equity}$$

Equation 5: Total Asset

$$DER = \frac{\text{Long Term Debt} + \text{Short Term Debt}}{\text{Total Assets}}$$

Equation 6: Debt To Equity Ratio

The Unique Context of Banks

Banks differ from non-financial companies in several ways that affect the interpretation of the D/E ratio:

1. ***Regulatory Environment:*** Banks are subject to stringent regulatory requirements, including those related to capital adequacy ratios set by international agreements such as Basel III. These regulations ensure that banks hold a certain level of capital relative to their risk-weighted assets.
2. ***Business Model:*** Unlike other businesses, banks use leverage as a fundamental part of their business model. They take deposits (liabilities) and lend them out (assets), earning income from the interest rate differential. This inherent leverage means banks typically have higher D/E ratios than companies in other sectors.
3. ***Risk Management:*** Banks have sophisticated risk management frameworks to assess and mitigate the risks associated with high leverage, including credit risk, market risk, and liquidity risk.

D/E Ratio and Bank Profitability

The relationship between the D/E ratio and bank profitability is complex and influenced by multiple factors:

- 3 **Financial Leverage:** Banks with higher D/E ratios are seen as more leveraged, which can amplify profits since borrowed funds are often used to extend loans and invest in securities. However, this leverage also increases the risks associated with potential defaults and market fluctuations.
- 4 **Interest Rate Environment:** The profitability of banks is significantly influenced by the interest rate environment. In a rising interest rate scenario, the cost of borrowing can increase, affecting banks with higher D/E ratios more adversely as their interest expenses rise, potentially squeezing net interest margins.
- 5 **Economic Conditions:** Economic downturns can lead to increased default rates, affecting highly leveraged banks more severely. Conversely, in a robust economic environment, banks with higher leverage may realize greater profitability due to increased loan demand and lower default rates.
- 6 **Regulatory Capital Requirements:** Banks must adhere to minimum capital requirements, which can limit their ability to increase leverage beyond certain levels. Banks that efficiently manage their capital structure while complying with regulatory requirements can optimize their D/E ratio for profitability.

Limitations and Considerations

While the D/E ratio provides valuable insights, it has limitations in isolation, especially for banks:

1. **Not a Standalone Measure:** For banks, the D/E ratio should be considered alongside other financial ratios and metrics, such as the Tier 1 capital ratio, return on assets (ROA), and return on equity (ROE), to get a comprehensive view of financial health and profitability.
2. **Quality of Capital:** The composition of a bank's equity and liabilities (e.g., tier 1 capital, subordinated debt) matters. High-quality capital can buffer against losses, supporting sustainable profitability.
3. **Interest Rate and Credit Risk:** The D/E ratio does not directly account for the risk profile of a bank's assets or its sensitivity to interest rate changes. These factors are critical to understanding the full picture of a bank's financial stability and profitability potential.

The Debt to Equity ratio, while a crucial measure of financial leverage and risk, must be contextualized within the broader operational and regulatory landscape of banking to understand its implications for profitability. Banks operate under a model that naturally incorporates higher

levels of leverage, making the interpretation of the D/E ratio and its impact on profitability more complex than in other sectors. Comprehensive analysis, combining the D/E ratio with other financial metrics and considering regulatory, economic, and market conditions, is essential for assessing a bank's financial health and profitability outlook.

Loan to Deposit Ratio (LDR)

The loan-to-deposit ratio (LDR) is used to assess a bank's liquidity by comparing a bank's total loans to its total deposits for the same period. The LDR is expressed as a percentage. If the ratio is too high, it means that the bank may not have enough liquidity to cover any unforeseen fund requirements. Conversely, if the ratio is too low, the bank may not be earning as much as it could be.

Formula and Calculation of the LDR

To calculate the loan-to-deposit ratio, we divide a bank's total amount of loans by the total amount of deposits for the same period. You can find the figures on a bank's balance sheet. Loans are listed as assets while deposits are listed as liabilities.

$$LDR = \frac{\textit{Total Loans}}{\textit{Total Deposits}}$$

Equation 7: Loan to Deposit Ratio

A loan-to-deposit ratio shows a bank's ability to cover loan losses and withdrawals by its customers. Investors monitor the LDR of banks to make sure there's adequate liquidity to cover loans in the event of an economic downturn resulting in loan defaults.

Also, the LDR helps to show how well a bank is attracting and retaining customers. If a bank's deposits are increasing, new money and new clients are being on-boarded. As a result, the bank will likely have more money to lend, which should increase earnings. Although it's counterintuitive, loans are an asset for a bank since banks earn interest income from lending. Deposits, on the other hand, are liabilities because banks must pay an interest rate on those deposits, albeit at a low rate.

The LDR can help investors determine if a bank is managed properly. If the bank isn't increasing its deposits or its deposits are shrinking, the bank will have less money to lend. In some cases, banks will borrow money to satisfy their loan demand in an attempt to boost interest income. However, if a bank is using debt to finance its lending operations instead of deposits, the bank will have debt servicing costs since it will need to pay interest on the debt.

As a result, a bank that borrows money to lend to its customers will typically have lower profit margins and more debt. A bank would rather use deposits to lend since the interest rates paid to depositors are far lower than the rates it would be charged for borrowing money. The LDR helps investors spot the banks that have enough deposits on hand to lend and won't need to resort to increasing their debt.

The proper LDR is a delicate balance for banks. If banks lend too much of their deposits, they might overextend themselves, particularly in an economic downturn. However, if banks lend too few of their deposits, they might have opportunity cost since their deposits would be sitting on their balance sheets earning no revenue. Banks with low LTD ratios might have lower interest income resulting in lower earnings.

Multiple factors can drive changes in the loan-to-deposit ratios. Economic conditions can impact loan demand as well as how much investors deposit. If consumers are unemployed, they're unlikely to increase their deposits. The Bank of Zambia regulates monetary policy by raising and lowering interest rates. If rates are low, loan demand might increase depending on the economic conditions. In short, there are many outside factors that impact a bank's LDR

Typically, the ideal loan-to-deposit ratio is 80% to 90%. A loan-to-deposit ratio of 100% means a bank loaned one dollar to customers for every dollar received in deposits it received. It also means a bank will not have significant reserves available for expected or unexpected contingencies.

Debt to Asset Ratio (DAR)

The Debt to Asset (D/A) ratio is a critical financial metric that sheds light on the leverage and financial stability of banks, offering insight into their operational efficiency and profitability. In the banking industry, where capital structure decisions are pivotal, understanding the relationship between a bank's indebtedness and its total assets provides valuable perspectives on its risk management practices and profit potential. This comprehensive exploration delves into how the

D/A ratio serves as a measure of bank profitability, elucidating its implications, the underlying mechanisms, and its interaction with regulatory frameworks and market conditions.

The Debt to Asset ratio, calculated by dividing a bank's total debt by its total assets, is a fundamental indicator of a bank's financial leverage.

$$DAR = \frac{Total\ Long\ Term\ Debt + Total\ Short\ term\ Debt}{Total\ Assets}$$

Equation 8: Debt to Asset Ratio

A higher ratio suggests that a bank has funded a significant portion of its assets with debt, whereas a lower ratio indicates a greater reliance on equity and internal resources. The importance of this ratio lies in its ability to signal the financial health and operational risk of a bank, which are intrinsically linked to its profitability (Rose and Hudgins, 2013).

Theoretical Underpinnings

The Modigliani and Miller theorem (1958) posits that, in perfect markets, the value of a firm is unaffected by its capital structure. However, real-world factors such as taxes, bankruptcy costs, and agency costs compel a reevaluation of this perspective, especially in the context of banks. The trade-off theory suggests that banks balance the tax advantages of debt financing against the costs of financial distress (Frank and Goyal, 2009). Meanwhile, the pecking order theory implies that banks prefer internal financing to avoid the signaling concerns associated with debt issuance (Myers and Majluf, 1984). These theories provide a backdrop for understanding how banks' leverage decisions, as reflected in the D/A ratio, influence their profitability.

Impact on Profitability

The relationship between the D/A ratio and bank profitability is multifaceted. On one hand, higher leverage, indicated by a greater D/A ratio, can amplify profitability through the tax shield provided by debt and the ability to fund more income-generating assets. On the other hand, excessive leverage increases the risk of financial distress and bankruptcy, potentially eroding profitability due to higher interest costs and adverse selection effects (Adrian and Shin, 2010).

Empirical studies have shown a nonlinear relationship between leverage and bank profitability. Berger and DeYoung (1997) found that while moderate levels of debt can enhance bank profitability by leveraging tax shields and expanding asset bases, beyond a certain threshold, the

cost of financial distress outweighs these benefits, leading to a decline in profitability. This finding underscores the existence of an optimal leverage level that maximizes profitability, which varies according to a bank's operational context and risk profile.

Regulatory Influences

Regulatory frameworks significantly impact the relationship between the D/A ratio and profitability. Basel III regulations, for instance, introduced stricter leverage ratios to enhance the resilience of banks, indirectly influencing their capital structures and profitability. The requirement to maintain higher levels of high-quality capital against assets has prompted banks to reassess their leverage strategies, balancing regulatory compliance with profitability objectives (Basel Committee on Banking Supervision, 2011).

Moreover, the implementation of risk-weighted asset measures has further nuanced the understanding of leverage, encouraging banks to optimize their asset portfolios for better risk-adjusted returns, thereby affecting their D/A ratios and profitability (Mariathan and Merrouche, 2014).

Market Conditions and Competitive Dynamics

The impact of the D/A ratio on bank profitability is also contingent upon prevailing market conditions and competitive dynamics. During periods of economic expansion, banks may benefit from higher leverage as the increased demand for loans boosts interest income, outweighing the costs associated with debt. Conversely, in economic downturns, high leverage can become a liability, as deteriorating loan quality and declining asset values strain financial stability and profitability (Demirgüç-Kunt and Huizinga, 2010).

Furthermore, the competitive landscape influences how banks manage their leverage. In highly competitive markets, banks may resort to increased leverage to sustain growth and profitability, potentially compromising their financial stability. This dynamic highlights the importance of strategic leverage management in maintaining a balance between competitive positioning and financial health (Boyd and De Nicrolo, 2005).

The Debt to Asset ratio is a pivotal metric that encapsulates the leverage decisions of banks, reflecting their approaches to risk management and their potential for profitability. While a higher

D/A ratio can signal opportunities for enhanced returns through the strategic use of debt, it also denotes increased exposure to financial distress, which can undermine profitability. The intricate relationship between leverage and profitability is influenced by a confluence of factors, including regulatory pressures, market conditions, and the theoretical underpinnings of capital structure decisions.

Empirical evidence suggests the existence of an optimal leverage level that banks strive to achieve, balancing the benefits of debt financing against the risks of financial instability. In this context, regulatory frameworks play a crucial role in shaping banks' leverage decisions, ensuring that their pursuit of profitability does not compromise their solvency or the stability of the financial system.

In summary, the Debt to Asset ratio serves as a crucial determinant of bank profitability, encapsulating the delicate balance between leveraging opportunities and the inherent risks of debt financing. Understanding this balance is essential for stakeholders, including regulators, investors, and bank management, to navigate the complexities of the banking industry and foster sustainable profitability.

Equity to Asset Ratio (EAR)

The equity-to-asset ratio is a measure of how much of a company's assets are owned by investors and how much of a company's assets are leveraged. This is a really important ratio because you don't want to be investing in a company that's doing a lot of heavy borrowing just to stay in business.

Equity to Asset Ratio (EAR) is a critical financial metric that offers deep insights into a bank's financial health, operational efficiency, and, notably, its profitability. This ratio, which compares a bank's total equity to its total assets, serves as a barometer for evaluating a bank's leverage and its capacity to sustain profits under varying economic conditions. Understanding the intricate relationship between the Equity to Asset Ratio and bank profitability requires an exploration of the foundational principles of bank finance, the implications of leverage, and the influence of regulatory frameworks and economic environments on banking operations.

The Foundation of Equity to Asset Ratio

$$EAR = \frac{\text{Total Equity}}{\text{Total Assets}}$$

Equation 9: Equity To Asset Ratio

The Equity to Asset Ratio is calculated by dividing a bank's total equity by its total assets. This ratio is pivotal in assessing a bank's financial leverage, indicating how much of the bank's assets are financed by equity as opposed to debt. A higher ratio suggests that a bank has a strong equity base, which can absorb losses and sustain operations during adverse economic conditions, thereby enhancing its stability and long-term profitability (Berger, 1995).

EAR and Bank Profitability: The Leverage Effect

At the core of the relationship between EAR and profitability is the concept of financial leverage. Banks with lower EAR are typically more leveraged, meaning they use more debt relative to equity to finance their assets. While leverage can amplify returns on equity during periods of economic growth, it also increases the risk of insolvency during downturns, as the bank must meet debt obligations regardless of its operating performance (Modigliani & Miller, 1958).

Conversely, a higher EAR indicates a more conservative financing strategy, reducing the risk of insolvency but potentially limiting profitability in the short term due to the lower use of leverage. However, banks with a strong equity base are often viewed as more stable and risk-averse, which can lead to lower funding costs and higher long-term profitability through sustained customer trust and operational resilience (Diamond & Rajan, 2000).

The Role of Regulatory Frameworks

Regulatory frameworks play a significant role in shaping the Equity to Asset Ratio of banks and, by extension, their profitability. Basel III, for instance, introduced more stringent capital requirements, including higher quality of capital and a minimum "conservation buffer," to enhance bank resilience following the 2008 financial crisis (Basel Committee on Banking Supervision, 2010). These regulations compel banks to maintain higher levels of equity, impacting their leverage strategies and potentially altering their paths to profitability.

Economic Conditions and EAR's Impact on Profitability

The economic environment significantly influences the relationship between the Equity to Asset Ratio and bank profitability. During periods of economic expansion, banks with lower EAR (and therefore higher leverage) might experience enhanced profitability due to increased lending

opportunities and higher interest margins. However, in economic downturns, these banks are more vulnerable to losses, which can erode profitability and even threaten their solvency. In contrast, banks with higher EAR are better positioned to withstand economic shocks, supporting sustained profitability through economic cycles (Flannery & Rangan, 2006).

Empirical Evidence

Empirical studies have provided mixed results on the direct impact of EAR on bank profitability, often highlighting the importance of context, such as economic conditions and regulatory environments. For example, Demirgüç-Kunt and Huizinga (1999) found that higher capital ratios, which correlate with higher EAR, are associated with higher profitability among large banks, partly due to lower funding costs. In contrast, smaller banks, which typically operate with higher EAR, may not enjoy the same benefits due to their limited access to capital markets and less diversified income sources.

Strategic Implications for Banks

Given the nuanced relationship between EAR and profitability, banks must strategically manage their capital structure to optimize profitability while ensuring financial stability. This involves not only adhering to regulatory capital requirements but also navigating the trade-offs between financial leverage and risk. Banks must continuously monitor their EAR in the context of current and anticipated economic conditions, adjusting their leverage and capital allocation strategies to balance the pursuit of profitability with the imperative of risk management.

If a company is instead looking to investors to help pay the bills, then it's owned by its owners and not effectively by its debtors. If a bankruptcy were to occur, the debtors would be taking a big chunk of the assets of a highly leveraged company, but the investors would get some amount of their investment back in a company that was primarily investor-funded.

Some companies have higher or lower equity-to-asset ratios, depending on the industry, so be sure to compare the company that interests you to its competitors so you can tell if the company is on par with the rest of the market.

Geographical and Contextual Variations

Much of the empirical research on bank profitability has focused on specific countries or regions, providing valuable insights but also highlighting the importance of context. Studies encompassing various countries, including the US (Berger, 1995), Greece (Kosmidou, 2006), and Malaysia (Guru et al., 1999), illustrate how local economic conditions, regulatory environments, and banking practices influence profitability. Notably, Molyneux and Thornton (1992) broadened the scope by examining banks across multiple European countries, setting a precedent for multi-country studies that consider a wider range of determinants.

The Regulatory Framework and Foreign Ownership

The regulatory framework within which banks operate has been identified as a significant determinant of profitability. Emerging economies, in particular, have seen increased foreign bank entry, which has been argued to influence profitability through several channels: the injection of capital, introduction of risk management expertise, enhanced competition, and technological spillovers. However, the effects of deregulation and the regulatory environment more broadly are less conclusively understood. Theories such as the contestable market theory suggest that lower barriers to entry may enhance profitability by fostering competition, yet empirical evidence remains varied.

The Equity to Asset Ratio is a fundamental metric that provides valuable insights into a bank's financial strategy, risk profile, and profitability potential. While a higher EAR can enhance a bank's resilience and long-term profitability by fostering stability and trust, a lower EAR can boost short-term profitability through the benefits of leverage. However, this comes at the cost of increased vulnerability to economic downturns and financial distress. Banks must, therefore, navigate this complex landscape with strategic acumen, balancing the benefits of leverage against the imperatives of risk management and regulatory compliance. In doing so, they can leverage their Equity to Asset Ratio not just as a measure of financial health but as a strategic tool for optimizing profitability in the challenging and dynamic world of banking.

4.1.1 External determinants of profitability

Turning to the external determinants of bank profitability, it should be noted that we can further distinguish between control variables that describe the macroeconomic environment, such as

inflation, interest rates and Gross Domestic Product, and variables that represent market characteristics. The latter refer to market concentration, industry size and ownership status.

Interest rate

Interest rate fluctuations play a huge role in the profitability of a bank. Loan rates can be separated into two major components – the interest rate paid to depositors and the rate added on by banks. That difference between the deposit rate and the loan rate is commonly referred to as the spread. The size of banking spreads serves as an indicator of efficiency in the financial sector because it reflects the costs of intermediation that banks incur (including normal profits). Some of these costs are imposed by the macroeconomic, regulatory and institutional environment in which banks operate while others are attributable to the internal characteristics of the banks themselves. Cost management efficiency is the single most important indicator in bank profitability. Therefore, banks can improve their profitability indicators by paying more attention on interest rates.

As financial intermediaries, banks play a crucial role in the operation of most economies. The primary reason why interest rates are important is because they are a source of banks' interest rate risk exposure. Changes in interest rates may “narrow the interest spread between assets and liabilities” because due to differences in the maturity of banks' instruments (banks borrow short term (long term) to fund long-term (short-term) assets) there are mismatches in the re-pricing of bank assets, liabilities, and off-balance sheet instruments (Wright and Houpt 1996, 115).

Research, as surveyed by Levine (1996), has shown that the efficacy of financial intermediation can also affect economic growth. Crucially, financial intermediation affects the net return to savings, and the gross return for investment. The spread between these two returns mirrors the bank interest margins, in addition to transaction costs and taxes borne directly by savers and investors. This suggests that bank interest spreads can be interpreted as an indicator of the efficiency of the banking system.

An increase in market interest rates means an increase in the price of banking products, which automatically leads to an increase in costs for businesses outside of the banking sector and is a source of inflation (Brockway 1989, 53). The increase in the costs of running business potentially

increases default risks of borrowers. This is an important example of how interest rates indirectly affect “default risk of loans, securities, and real estate holdings” (Madura and Zarruk 1995, 5).

Interest rate is an important macroeconomic determinant of bank performance. A comprehensive review of determinants of interest spreads is offered by Hanson and Rocha (1986). That paper summarizes the role that implicit and explicit taxes play in raising spreads and goes on to discuss some of the determinants of bank cost and profits, such as inflation, scale economies, and market structure. Using aggregate interest data for 29 countries in the years 1975-1983, the authors find a positive correlation between interest margins and inflation.

Recently, several studies have examined the impact of international differences in bank regulation using cross-country data. Analyzing interest rates in 13 OECD countries in the years 1985-1990, Bartholdy, Boyle, and Stover (1997) find that the existence of explicit deposit insurance lowers the deposit interest rate by 25 basis points. Using data from 19 developed countries in 1993, Barth, Nolle and Rice (1997) further examine the impact of banking powers on bank return on equity - controlling for a variety of bank and market characteristics. Variation in banking powers, bank concentration and the existence of explicit deposit insurance do not significantly affect the return on bank equity.

Ogunleye (2001: 61) argues that when interest rates rise or fall, it exerts an impact on banks' profits through adjustment to revenues; and this comes about in two ways. First, an increase in market rates raises the amount of income a bank can earn on new assets it acquires. However, the speed with which revenues adjust to new market conditions depends on how long it takes for the average asset's interest rate to adjust to current market rates (Flannery, 1980). Secondly, the effect could come through impact on the bank's decisions about which loans and securities to purchase and how much to hold in cash reserves (apart from regulatory requirement).

In time of rising rates, rates on loans are usually higher than rates on marketable securities; hence banks are likely to book more loans to earn higher incomes than buying securities. In the same vein, banks' holdings of cash reserves and non-earning assets would be at the lowest level, since these groups of assets yield little or nothing. Therefore, total income during periods of rising rates increase even more than the proportion of increase in rates. Empirical evidence from Molyneux

and Thornton (1992) and Demirgüç-Kunt and Huizinga (1999) indicate that high interest rate is significantly associated with higher bank profitability, i.e. a significant positive relationship. Demirgüç-Kunt and Huizinga (1999) emphasize that this relationship is more so in developing countries. But, conversely, Naceur (2003) highlights a negative relationship between interest rates and bank profitability. The contradiction between these researchers generates a need for further empirical analyses of the relationship between interest rates and bank profitability.

Among other macro-factors that could influence banks' performance, Beckmann (2007, 9) highlighted the ambiguous effect of real interest rates on performance of banking organizations due to the initial "dampening effect of a rise in real interest rates on credit demand and accompanying deterioration in credit quality" that could contribute to negative association of interest rates with ROA. Beckmann (2007) also found a very strong impact of real interest rate on the return on assets.

Performance tends to be influenced by interest rates, which influence composition of banks' portfolio, in the following way. According to Brechling and Clayton (1965), an increase in interest rates tends to induce FIs to restructure portfolios through decrease in the amount of liquid assets (cash, money at call, Treasury bills) and corresponding increase in the amount of investments into interest-bearing securities and advances, This strategy leads to changes in the relative earning power of various assets in the portfolio. In particular, it leads to an increase in the earning power of interest-bearing securities.

In essence, changes in interest rates should not significantly affect short-term assets and liabilities as they are re-priced more frequently than long-term ones. The latter are more sensitive to changes in interest rates (Ghazanfari, Rogers, and Sarmas 2007, 349-350), which may result in squeezing of interest margins and, as a result, in a decrease in banks' profitability.

Yap and Kader (2008) assessed the impact of changes in interest rates on performance of conventional and Islamic banking organizations running in parallel in Malaysia (where Islamic banking was introduced in 1983) over the period of 1999-2007, which was characterized by falling interest rates in Malaysia. They found that depositors at Islamic banks did not react to changes in interest rates suggesting that "there is no shifting effect between the Islamic and conventional

deposits in response to changes in conventional interest rates,” which could be explained by moving rates of return on deposits in Islamic banks very closely with interest rates offered by conventional banks during time period under investigation (Yap and Kader 2008, 129-130).

In terms of financing, the authors concluded that customers of Islamic banks are profit oriented and suggested that during a decrease in discount rates/basis rates BBA (Bai bathamin ajil – fixed rate asset) financing offered by Islamic banks (fixed rate assets financing is collateralized) is less popular than getting loans from conventional banks due to the fixed rate of BBA financing and vice versa if there is a reverse situation. They noted that, in essence, divergence of rates (on deposits or loans) between Islamic and conventional banks due to changes in market interest rates would lead to switching banks by customers. In this respect, one must bear in mind that profitability of banks in dual banking systems will be influenced not only by micro and environmental factors (the impact of latter is going to be assessed in this study), but also by type of bank (Islamic or conventional).

Despite significant regulatory concern paid to the interest-rate risk that banks face (OCC [2004]; Basel Committee on Banking Supervision [2004]), research on a key component of earnings that may be most sensitive to interest shocks—namely, bank net interest margins—has been limited thus far, particularly for U.S. banks. With a few exceptions discussed in this section, there has been little published research on the effects of interest-rate risk on bank performance since the late 1980s.

Al-Haschimi (2007) studies the determinants of bank net interest rate margins in 10 SSA countries. He finds that credit risk and operating inefficiencies (which signal market power) explain most of the variation in net interest margins across the region. Macroeconomic risk has only limited effects on net interest margins in the study. Using bank level data for 80 countries in the 1988–95 period, Demirgüç-Kunt and Huizinga (1998) analyze how bank characteristics and the overall banking environment affect both interest rate margins and bank returns. In considering both measures, this study provides a decomposition of the income effects of a number of determinants that affect depositor and borrower behavior, as opposed to that of shareholders. Results suggest that macroeconomic and regulatory conditions have a pronounced impact on margins and profitability. Lower market concentration ratios lead to lower margins and profits, while the effect of foreign

ownership varies between industrialized and developing countries. In particular, foreign banks have higher margins and profits compared to domestic banks in developing countries, while the opposite holds in developed countries. Gelos (2006) studies the determinants of bank interest margins in Latin America using bank and country level data.

He finds that spreads are large because of relatively high interest rates (which in the study is a proxy for high macroeconomic risk, including from inflation), less efficient banks, and higher reserve requirements. In a study of United States banks for the period 1989–93, Angbazo (1997) finds that net interest margins reflect primarily credit and macroeconomic risk premia. In addition, there is evidence that net interest margins are positively related to core capital, non-interest bearing reserves, and management quality, but negatively related to liquidity risk. Saunders and Schumacher (2000) apply the model of Ho and Saunders (1981) to analyze the determinants of interest margins in six countries of the European Union and the US during the period 1988–95. They find that macroeconomic volatility and regulations have a significant impact on bank interest rate margins. Their results also suggest an important trade-off between ensuring bank solvency, as defined by high capital to asset ratios, and lowering the cost of financial services to consumers, as measured by low interest rate margins.

Theoretical models of net interest margins have typically derived an optimal margin for a bank, given the uncertainty, the competitive structure of the market in which it operates, and the degree of its management's risk aversion. The fundamental assumption of bank behavior in these models is that the net interest margin is an objective to be maximized. In the dealer model developed by Ho and Saunders (1981), bank uncertainty results from an asynchronous and random arrival of loans and deposits.

A banking firm that maximizes the utility of shareholder wealth selects an optimal markup (markdown) for loans (deposits) that minimizes the risks of surplus in the demand for deposits or in the supply of loans. Ho and Saunders control for idiosyncratic factors that influence the net interest margins of an individual bank, and derive a "pure interest margin," which is assumed to be universal across banks. They find that this "pure interest margin" depends on the degree of management risk aversion, the size of bank transactions, the banking market structure, and interest-rate volatility, with the rate volatility dominating the change in the pure interest margin over time.

Allen (1988) extends the single-product model of Ho and Saunders to include heterogeneous loans and deposits, and posits that pure interest spreads may be reduced as a result of product diversification. Saunders and Schumacher (2000) apply the dealer model to six European countries and the United States, using data for 614 banks for the period from 1988 to 1995, and find that regulatory requirements and interest-rate volatility have significant effects on bank interest-rate margins across these countries. Angbazo (1997) develops an empirical model, using Call Report data for different size classes of banks for the period between 1989 and 1993, incorporating credit risk into the basic NIM model, and finds that the net interest margins of commercial banks reflect both default and interest-rate risk premia and that banks of different sizes are sensitive to different types of risk. Angbazo finds that among commercial banks with assets greater than \$1 billion, net interest margins of money-center banks are sensitive to credit risk but not to interest-rate risk, whereas the NIM of regional banks are sensitive to interest-rate risk but not to credit risk. In addition, Angbazo finds that off-balance-sheet items do affect net interest margins for all bank types except regional banks. Individual off-balance-sheet items such as loan commitments, letters of credit, and net securities lent, net acceptances acquired, swaps, and options have varying degrees of statistical significance across bank types.

Zarruk (1989) presents an alternative theoretical model of net interest margins for a banking firm that maximizes an expected utility of profits that relies on the “cost of goods sold” approach. Uncertainty is introduced to the model through the deposit supply function that contains a random element. Zarruk posits that under a reasonable assumption of decreasing absolute risk aversion, the bank’s spread increases with the amount of equity capital and decreases with deposit variability. Risk-averse firms lower the risk of profit variability by increasing the deposit rate. Zarruk and Madura (1992) show that when uncertainty arises from loan losses, deposit insurance, and capital regulations, a higher uncertainty of loan losses will have a negative effect on net interest margins. Madura and Zarruk (1995) find that bank interest-rate risk varies among countries, a finding that supports the need to capture interest-rate risk

However, Wong (1997) introduces multiple differentials in the risk-based capital requirements. sources of uncertainty to the model and finds that size-preserving increases in the bank’s market power, an increase in the marginal administrative cost of loans, and mean-preserving increases in credit risk and interest-rate risk have positive effects on the bank spread.

Both the dealer and cost-of-goods models of net interest margins have two important limitations. First, these models are single-horizon, static models in which homogenous assets and liabilities are priced at prevailing loan and deposit rates on the basis of the same reference rate. In reality, bank portfolios are characterized by heterogeneous assets and liabilities that have different security, maturity, and repricing structures that often extend far beyond a single horizon.

As a result, assuming that bankers do not have perfect foresight, decisions regarding loans and deposits made in one period affect net interest margins in subsequent periods as banks face changes in interest-rate volatility, the yield curve, and credit risk.

Banks' ability to respond to these shocks in the period is constrained by the ex ante composition of their assets and liabilities and their capacity to price changes in risks effectively. In addition, the credit cycle and the strength of new loan demand determine the magnitude of the effect of interest-rate shocks on banks' earnings. In this regard, Hasan and Sarkar (2002) show that banks with a larger lending slack, or a greater amount of "loans-in-process," are less vulnerable to interest-rate risk than banks with a smaller amount of loans in process.

Empirical evidence, using aggregate bank loan and time deposit (CD) data from 1985 to 1996, indicates that low-slack banks indeed have significantly more interest-rate risk than high-slack banks. The model also makes predictions regarding the effect of deposit and lending rate parameters on bank credit availability that were not empirically tested with aggregate data. The second important limitation of both the dealer and cost-of-goods models of net interest margins is that they treat the banking industry either as being homogenous or as having limited heterogeneous traits based only on their asset size.

Exchange Rate & profitability

Exchange rates represent the number of units of a given currency of one country that can be exchanged for unit of another currency (Van Horne, 1986). Today foreign exchange has been the talk of the town, and this is because foreign exchange plays a very crucial role in the overall performance of the national economy. The practice of managing foreign exchange resources has therefore evolved broadly in line with the globalization and liberalization of economies and financial market. This has planned over such areas as risk management and active portfolio

management. Broadly speaking foreign exchange is held and managed to facilitate international transactions. (Anifowoshe, 1997).

If there were a single international currency there would be no need for a foreign exchange market. The purpose of foreign exchange market is to enhance transfer of purchasing power dominated in one currency for another currency. The foreign exchange market is not a physical place rather it is an electronically linked network of banks, foreign exchange brokers and dealers whose function is to bring together buyers and sellers of foreign exchange. So, Bank profitability could be affected by the nature of a country's exchange rate regime. Ogunleye (1995: 56) has asserted that bank profitability is largely constrained by a fixed exchange rate regime; whereas, in a regime of partial / outright liberalization of the foreign exchange (forex) market, banks are given enough latitude to trade in forex and hence improve the overall profitability.

Due to very intensive involvement of banking organizations in foreign currency trading activities, the issue of risks associated with it deserves some attention. In the literature, a large number of empirical works have been carried out to examine the foreign exchange exposure of banks. However, past studies mainly focused on banking markets which are well developed, including the US (Grammatikos et al. (1986), Choi et al. (1992), Choi and Elyasiani (1997), and Martin and Mauer (2003, 2005)), Japan (Chamberlain et al. (1997)), Canada (Atindéhou and Gueyie (2001)), and Australia (Chi et al. (2007)), or large banking institutions (Martin (2000)). By comparison, studies focusing on less developed banking markets are relatively scant.

Grammatikos, Saunders, and Swary (1986, 671) stated that there are two types of risk related to foreign currency trading activities, namely exchange rate risk, which comes from unexpected change in exchange rates in the presence of "a positive (or negative) net asset position [in terms of size] in a particular foreign currency", and foreign interest risk, which occurs from changes in interest rates in the presence of mismatched maturities of banks' "foreign currency assets and liabilities."

If foreign currency assets are greater (smaller) than liabilities, an appreciation (depreciation) in the foreign currency vis-à-vis the dollar generates capital gains (losses) either on paper or realized. If the average duration of its foreign currency assets is greater (smaller) than its liabilities, then an

unexpected upward parallel shift in the term structure of foreign interest rates will reduce (increase) the bank's net interest earnings (Grammatikos, Saunders, and Swary 1986, 671).

The authors analyzed the overall performance and risks of banks associated with foreign currency trading activities in the US from December, 1975 to November, 1981, and noted that there is a possibility that "diversification by the bank into many currencies" might "reduce the overall risk exposure" even in the presence of mismatch in the maturities (durations) of its foreign currency assets and liabilities (Grammatikos, Saunders, and Swary 1986, 675).

As emerging markets become more integrated into global capital markets, the choice of exchange rate arrangement by those countries is receiving more attention because it is regarded as one of the sources of main economic crises like "the Mexican peso crisis in 1994–95, and the Asian crisis in 1997–98" as a result of which the "hollowing-out hypothesis" or the "bipolar view" is becoming more popular, even though it is still not well-accepted. This hypothesis explains that

...in a world of increasing international capital mobility, only the two extreme exchange rate regimes are likely to be sustainable – either a permanently fixed exchange rate regime (i.e., a "hard fix") such as a currency board or monetary union, or a freely floating exchange rate regime (Bailliu and Murray 2003, 17).

As shown by Chamberlain et al. (1997), to the extent that banks' direct exposure generally provides a significant explanation for banks' foreign exchange exposure, it only measures banks' foreign exchange risk partially. Using a bank's loan to an exporter as an example, Chamberlain et al. (1997) demonstrate that banks that perfectly hedge their accounting exposure could still be exposed to significant foreign exchange risk if exchange rate movements affect cash flows, competitiveness, and credit risk of banks' customers significantly.

Gross Domestic Product and Profitability

Understanding the intricate relationship between Gross Domestic Product (GDP) growth and bank profitability is essential for both economists and financial analysts. GDP, representing the total market value of all goods and services produced within a country over a specific period, serves as a primary indicator of economic health. Its fluctuations can have profound effects on various sectors, including the banking industry. GDP growth impacts bank profitability, considering

various dimensions such as lending, asset quality, operational costs, and the broader macroeconomic environment.

The relationship between GDP growth and bank profitability can be examined through several theoretical lenses, including the credit cycle theory and the financial intermediation theory. The credit cycle theory suggests that economic expansions lead to increased demand for credit, improving bank profits through higher interest income and loan volumes. Financial intermediation theory posits that banks, as intermediaries, can capitalize on economic growth by efficiently mobilizing savings towards investment in productive activities, thereby enhancing their profitability.

Positive Impacts of GDP Growth on Bank Profitability

- ***Increased Lending Opportunities:*** A growing economy stimulates both consumer spending and business investments, leading to a heightened demand for credit. Banks benefit from this increased demand through expanded loan portfolios, which directly boost their interest income. Moreover, economic expansions enable banks to diversify their loan products and target new customer segments, further enhancing revenue opportunities.
- ***Improved Loan Quality:*** Economic growth generally improves the financial health of both businesses and individuals, leading to lower default rates on loans. This improvement in loan quality reduces the banks' provisioning for bad debts and write-offs, positively affecting their bottom line. A stable income stream for borrowers means that banks can expect regular repayment, reducing the risk associated with lending.
- ***Higher Fee-Based Income:*** An expanding economy drives the demand for various banking services, including asset management, financial advisory, and transaction processing. As businesses seek to expand and individuals increase their wealth, they are more likely to avail themselves of these value-added services, contributing to banks' non-interest income.
- ***Asset Quality and Valuation:*** Economic expansions can lead to an appreciation of asset values, such as real estate and securities. Banks holding such assets may benefit from increased valuations, positively impacting their financial statements and providing opportunities for income generation through strategic asset sales.

Despite the generally positive correlation between GDP growth and bank profitability, certain challenges and considerations must be acknowledged:

- ***Interest Rate Environment:*** While economic growth can lead to increased lending activities, it can also prompt central banks to raise interest rates to control inflation. Higher interest rates can increase the cost of funds for banks, potentially squeezing their net interest margins if the banks cannot pass these costs onto borrowers effectively.
- ***Increased Competition:*** Economic growth attracts more players to the banking sector, heightening competition. This increased competition can erode pricing power over loans and services, affecting profitability. Banks may need to innovate and improve operational efficiencies to maintain or grow their profit margins in a competitive landscape.
- ***Operational Costs:*** In an attempt to capture more market share during economic expansions, banks might invest in new technologies, branch networks, and human resources. While these investments are intended to spur long-term growth, they can lead to increased operational costs in the short term, potentially diluting profitability if not managed prudently.
- ***Regulatory Considerations:*** A growing economy can lead to tighter regulatory oversight to ensure financial stability. New regulations might impose additional compliance costs on banks or restrict certain high-profit activities, affecting their overall profitability.

The broader macroeconomic environment plays a crucial role in mediating the relationship between GDP growth and bank profitability. For instance, global economic trends, such as international trade dynamics, can influence domestic economic growth and, by extension, the profitability of domestic banks. Additionally, fiscal policies, including government spending and taxation, can have significant impacts on economic growth and the banking sector's performance.

Empirical studies across different countries and economic cycles provide valuable insights into the relationship between GDP growth and bank profitability. For example, research often highlights that banks in emerging markets may experience more pronounced effects of GDP growth on profitability due to more volatile economic conditions and higher growth rates compared to developed markets. Case studies from specific banking crises or boom periods can offer lessons on managing risks and leveraging opportunities associated with economic fluctuations.

The relationship between GDP growth and bank profitability is complex and multifaceted. While a growing economy generally presents opportunities for banks to enhance their profitability through increased lending, improved loan quality, and higher fee-based income, there are also challenges to navigate, including competitive pressures, operational costs, and regulatory changes. Banks must strategically manage these dynamics to capitalize on economic growth while mitigating risks. Understanding the nuances of this relationship is crucial for bankers, policymakers, and investors alike, as it informs decision-making and strategy in the financial sector.

2.4 The Zambian Economy and COVID 19

2.4.1 *Introduction*

The Zambian economy, like many others globally, faced unprecedented challenges due to the COVID-19 pandemic. The pandemic's impact on health, economic activities, and overall societal norms has been profound, pushing nations to adapt and reevaluate their economic strategies. Zambia, a country heavily reliant on copper mining, agriculture, and tourism for its economic sustenance, was not spared from the disruptions caused by COVID-19. This essay delves into the multifaceted impacts of the pandemic on Zambia's economy, the government's response, and the path to recovery, drawing on various sources and empirical data.

The outbreak of the COVID-19 pandemic in late 2019 and its subsequent spread worldwide in early 2020 led to a global health crisis with significant economic repercussions. Zambia reported its first COVID-19 cases in March 2020, prompting the government to implement various containment measures, including travel restrictions, partial lockdowns, and social distancing guidelines. These measures, while necessary to curb the spread of the virus, had immediate and profound effects on the Zambian economy.

2.4.2 *Impact on Key Economic Sectors*

Copper Mining Sector

Copper mining is Zambia's largest industry, accounting for a substantial portion of the country's exports and government revenue. The pandemic disrupted global supply chains and led to a decline in copper prices in the initial months, adversely affecting Zambia's export earnings. However, as global conditions began to stabilize and demand for copper, especially from China, remained

strong, copper prices rebounded, offering some relief to the Zambian economy (World Bank, 2020).

Agriculture

Agriculture is a vital sector for Zambia's food security and rural livelihoods. The pandemic's impact on agriculture was mixed. On one hand, logistical challenges and border closures affected farmers' access to markets and inputs, impacting productivity. On the other hand, the sector experienced an increase in demand for some local produce, partially offsetting the negative impacts (IMF, 2021).

Tourism

Tourism, another critical sector for Zambia, particularly due to attractions like the Victoria Falls, suffered significantly due to travel restrictions and lockdown measures. The loss of tourism revenue impacted not only the economy but also conservation efforts funded by tourism-related activities (UNWTO, 2020).

2.4.3 Government Response and Economic Measures

In response to the economic downturn, the Zambian government implemented several measures aimed at mitigating the pandemic's impact. These included fiscal policies to support businesses and individuals, monetary policies to ensure liquidity in the economy, and initiatives to secure international financial support.

Fiscal Policies

The government introduced tax reliefs, deferred tax payments, and provided targeted financial support to vulnerable businesses and sectors, such as tourism (Government of Zambia, 2020). Despite these efforts, the fiscal space remained constrained due to pre-existing debt obligations and declining revenue.

Monetary Policies

The Bank of Zambia enacted measures to maintain liquidity, including reducing interest rates and relaxing reserve requirements for banks. These measures aimed to encourage lending and support economic activity (Bank of Zambia, 2020).

International Support

Zambia sought support from international partners and organizations. The country received emergency funding from institutions like the International Monetary Fund (IMF) and the World Bank to support its response to the pandemic and stabilize the economy (IMF, 2020).

2.4.4 Economic Recovery and the Path Forward

The path to economic recovery for Zambia post-COVID-19 is complex and requires a multifaceted approach. Key areas of focus include enhancing the resilience of the economy to external shocks, diversifying the economic base beyond copper mining, investing in sustainable agriculture, and revitalizing the tourism sector.

Economic Diversification

Diversifying the economy is crucial for reducing vulnerability to global commodity price shocks. Investing in sectors such as agriculture, manufacturing, and technology could provide new sources of growth and employment (African Development Bank, 2021).

Sustainable Agriculture

Enhancing the agriculture sector's productivity and resilience is essential for food security and rural livelihoods. Investments in irrigation, technology, and access to markets can support sustainable growth in this sector.

Tourism Revitalization

Reviving the tourism sector will require innovative strategies to adapt to the new normal, including promoting domestic tourism and implementing health and safety protocols to reassure international visitors (UNWTO, 2020).

Fiscal and Debt Management

Addressing fiscal challenges and managing public debt sustainably are crucial for economic stability. Engaging with creditors for debt relief or restructuring could provide the fiscal space needed for recovery and growth initiatives (World Bank, 2021).

The COVID-19 pandemic has had a profound impact on the Zambian economy, highlighting vulnerabilities and the need for strategic reforms. While the immediate response focused on

mitigating the health and economic impacts, the long-term recovery requires a comprehensive strategy centered on diversification, sustainability, and resilience. By focusing on these areas, Zambia can not only recover from the pandemic but also build a stronger, more diversified economy that can withstand future shocks.

2.5 COVID 19 and Bank Performance

Given the casual relationship between economic growth and the fortunes of the financial services sector, the banks remain at risk of being disproportionately impacted by a prolonged slowdown in the economy. In the context of Zambia, the economic challenges have affected banks to varying degrees. It is also generally acknowledged that the full extent of the effects of the country's pre-COVID-19 economic challenges, compounded by the negative impact of the pandemic, is yet to crystallise.

Specifically, prior to the on-set of the pandemic, Zambia was already grappling with challenges that included fiscal strain occasioned by the country's debt repayment commitments, the effects of power shortages, exchange rate fragility and rising inflation rate. As noted above, inflation increased from 9% in 2019 to 22% in 2021.

Largely on account of the effects of the COVID-19 pandemic, African Development Bank revised its 2020 growth projections down from 2.4% prior to the pandemic to -4% (best case) and -6.5% (worst case). Travel restrictions and slowdown in global trade have hit the tourism and mining sectors particularly hard and added strain to foreign exchange inflows. As a result, the Zambian Kwacha has depreciated by 16% against the United States Dollar (USD) since the on-set of the pandemic in March 2020 to December 2020. Inflation has also increased from 14.00% to 19.2% during the same period. (www.boz.zm).

The banking sector has been impacted by these negative trends, with Fitch Solutions forecasting a slowdown in credit growth from 17.7% in 2019 to 7.6% in 2020. This is consistent with the views of respondents indicating that the current economic conditions had resulted in an increase in operational costs, credit risk, and slowdown in revenue growth and reduction in profitability.

According to the end of year report issued by BOZ, the 2020 growth rate was -2.78%, which was lower than what African Development Bank projected and the 2021 growth rate was 4.60%. This showed a tremendous improvement of over 7% increase from the previous year. (BOZ 2021).

Real GDP growth for the Sub-Saharan Africa (SSA) region was 4.5 percent in 2021 compared to a contraction of 1.7 percent in 2020 (Table 2.1). The recovery was largely driven by strong external demand, particularly for commodity exports, and a modest increase in tourism activity as travel restrictions gradually eased. Growth in Nigeria and South Africa—leading SSA economies—rebounded to 3.6 percent and 4.9 percent in 2021 from a contraction of 1.8 percent and 6.4 percent in 2020, respectively. Preliminary estimates show that the Zambian economy also recovered to 3.6 percent in 2021 (BOZ 2021)

The Earnings Performance Improved significantly in 2021 as the sector posted profit before tax (PBT) of K8.1 billion, 227.6 percent higher than the previous year (Table 9.12). Higher profits were mainly due to net interest income, non-interest income, and lower provisioning due to fewer IFRS-9 related impairments as a result of an upgrade of local currency debt by Fitch in April 2021. The cost to income ratio, at 54.4 percent, was within the prudential threshold of 60.0 percent in 2021 compared to 72.0 percent in 2020. This was due to a higher percentage growth in net operating income relative to the rise in overhead costs (Chart 9.4). Consequently, the return on assets (ROA) and return in equity (ROE) increased to 5.2 percent and 35.1 percent in 2021 from 2.1 percent and 12.9 percent in 2020, respectively (Table 9.12).

Particulars	2019	2020	2021
Interest Income	9.7	12.5	17.0
Interest Expenses	3.2	4.2	4.8
Net Interest Income	6.6	8.3	12.2
Non-Interest Income	3.7	4.7	6.6
Net Operating Income	10.2	13.0	18.8
Non-Interest Expenses	6.7	9.4	10.2
Pre-Provision Operating Profit (PPP)	3.5	3.6	8.6
Loan Loss Provisions	0.6	1.1	0.5
Profit Before Taxation	2.8	2.5	8.1
Taxation	1.2	1.0	2.9
Net Profit	1.7	1.5	5.1

Table 5: Summserised Income Statement

Liquidity conditions were sustained in 2021 mainly due to net Government spending, enhanced disbursements under the TMTRF, and settlement of bonds under SMBPP. As a result, the ratio of liquid assets to deposits and short-term liabilities (liquidity ratio) and liquid assets to total assets ratios remained high at 56.3 percent and 46.6 percent, respectively (Chart 9.6). The loan to deposit ratio declined to 39.4 percent in 2021 from 41.0 percent in 2020 and remained below the prudential benchmark of 100.0 percent (Chart 9.7).

2.5.1 Empirical Studies

The nuanced impact of the COVID-19 pandemic on banks necessitates an in-depth analysis, comparing bank performance before and during the crisis. It's essential to discern the specific bank factors—internal dynamics within a bank—and industry-related factors—external influences from the broader economic and regulatory environment—that contribute to the profitability of locally owned banks. Various studies have attempted to dissect these elements, exploring the intricacies of bank performance across different regions including Sub Saharan Africa, Kenya, Ethiopia, and Pakistan, among others.

A pivotal study in Pakistan by Burki and Niazi (2003) highlighted the importance of bank size, loan interest rates, and the loans-to-deposit ratio as significant determinants of bank profitability. These findings underscore the influence of internal banking strategies and market positioning on financial outcomes.

2.5.2 Banking Dynamics in Sub-Saharan Africa (SSA)

Bank performance in Sub-Saharan African nations is a complex interplay of internal capabilities and external market and economic conditions. Ezra (2013) conducted an extensive study across 42 countries in SSA, analyzing 216 commercial banks from 1999 to 2006. Utilizing a cost efficiency model and a panel random effects methodology, Ezra identified key determinants of bank profitability including growth in bank deposits, asset growth, capital adequacy, operational efficiency, and liquidity ratio, alongside macroeconomic variables like GDP growth and inflation. This comprehensive analysis revealed that both sets of factors are crucial in understanding the variability in bank profitability over the period studied.

2.5.3 Insights from Kenya

In Kenya, research by Okoth et al. (2013) further reinforced the significance of bank-specific factors on financial performance, employing linear multiple regression and Generalized Least Square techniques. Their findings highlighted the paramount importance of internal bank management practices, although liquidity appeared less influential compared to other internal factors.

Despite the wealth of research on bank performance determinants, a consensus remains elusive, indicating a complex and multifaceted nature of banking sector dynamics.

2.5.4 *An Ethiopian Perspective*

Ethiopian studies on bank performance have often overlooked critical elements such as capital structure and effective tax rate—key variables that significantly affect bank performance. Recognizing this gap, this research integrates these crucial factors to provide a more holistic understanding of what drives bank performance in Ethiopia, aiming to offer actionable insights for bank management and policy formulation.

2.5.5 *Single Country Studies: A Case of Greek Banks*

Athanasoglou et al. (2005) embarked on an investigation into Greek banks covering 1985 to 2001, aiming to discern the impact of bank-specific, industry-specific, and macroeconomic determinants on profitability. Employing a GMM technique within an empirical framework that incorporates the Structure-Conduct-Performance (SCP) hypothesis, the study concluded that factors like capital adequacy, credit risk exposure, labor productivity, and expense management are instrumental in shaping bank profitability. Interestingly, the study noted no significant economies of scale regarding bank size, and similarly, the ownership status did not emerge as a determinant of profitability. Additionally, the anticipated industry concentration effect on profitability, as suggested by the SCP hypothesis, was not substantiated.

The exploration of bank performance determinants, particularly in the context of the COVID-19 pandemic, underscores a complex interplay of internal strategies and external pressures. While studies provide valuable insights into the factors influencing profitability, the variance in findings across different regions and periods suggests that bank performance is a multifaceted phenomenon. This diversity in outcomes highlights the importance of contextual and temporal dynamics in assessing bank performance, urging a continuous and nuanced approach to research in this field.

2.6 Gaps Identified

2.6.1 *Evidence Gap*

Previous studies, such as those by Belayneh (2011) and Amdemikael (2012), focused on the Ethiopian banking sector, highlighting several performance determinants but omitting crucial variables like capital structure and effective tax rate.

The absence of consideration for these variables represents an evidence gap, as existing research may not fully capture the complexity and multifaceted nature of bank performance determinants.

2.6.2 *Knowledge Gap*

Despite the proliferation of literature on bank performance determinants, there remains a lack of consensus on which factors are most influential. This is evidenced by the divergent findings across different studies, with some focusing on macroeconomic factors and others on bank-specific drivers.

This inconsistency points to a knowledge gap, underscoring the need for research that integrates various perspectives to offer a more holistic understanding of bank performance.

2.6.3 *Practical Knowledge Conflict Gap*

The studies by Deli Yuan et al. (2022) and Shawuya Jigeer et al. (2023) offer insights into the profitability determinants in South Asian and Chinese commercial banks, respectively. However, they do not account for the unique contexts of local banks or the impacts of the COVID-19 pandemic.

The disparity between the generalized findings of these studies and the specific needs and circumstances of local banks in Zambia during the COVID-19 crisis indicates a practical knowledge conflict gap.

2.6.4 *Methodological Gap*

Methodological approaches vary significantly across studies, with some employing unbalanced panel data (Ezra, 2013) and others focusing exclusively on listed public sector banks (A.M Goyal, 2013).

This variation in methodological approaches, particularly the lack of studies employing balanced panel data or inclusive criteria for bank selection, represents a methodological gap in the literature.

2.6.5 *Empirical Gap*

The focus of previous research has largely been on commercial banks to the exclusion of local banks, as seen in the studies by Okoth et al. (2013) and others.

The underrepresentation of local banks in empirical studies, especially in the context of Zambia, highlights an empirical gap in understanding the specific performance determinants of this bank category.

2.6.6 Theoretical Gap

While several studies have contributed to understanding bank performance determinants, they have not sufficiently explored the theoretical frameworks that could explain the varying impacts of these determinants in different economic and regulatory contexts.

The lack of theoretical exploration into how and why certain determinants affect bank performance differently across contexts signifies a theoretical gap.

2.6.7 Population Gap

Most studies have not differentiated between the impacts of various determinants on bank performance before and during the COVID-19 pandemic, a period of significant economic upheaval and also this study was focused primarily on Zambian locally owned Banks.

This oversight reveals a population gap, as the unique challenges and opportunities presented by the pandemic era require targeted investigation to understand their effects on bank performance.

Other Gaps Identified

S/N	Author	Study/Focus	Identified Gap
1	Deli Yuan Et Al (2022)	Profitability determining factors of banking sector: Panel data analysis of commercial banks in South Asian countries.	The study did not analyse effects in relation to COVID.
2	Shawuya Jigeer Et Al (2023)	The Determinants of Profitability in the City Commercial Banks: Case of China	The study only included commercial banks. It did not focus solely on Local banks.
3	A.M Goyal 2013	'Impact of Capital Structure on Performance of Listed Public Sector Banks in India'	It focused only on listed banks.
4	Alkhatib, A (2012)	'Financial Performance of Palestinian Commercial Banks'	The criteria for institutional was not clearly outlined.

5	Okoth <i>et al.</i> (2013)	The Determinants of Financial Performance of Commercial Banks in Kenya	The focus was on commercial banks. It did not look at local banks.
6	Ezra (2013)	The determinants of commercial banks profitability in SSA by using unbalanced panel data of 216 commercial banks taken from 42 countries in SSA for the time period of 1999-2006	Unbalance Panel Data was used.
7	Athanasoglou et al. (2005)	Examine the effect of bank specific, industry-specific and macroeconomic determinants of bank profitability	The study did not analyse Debt ratios as factors that impact profitability.
8	Belayneh (2011),	The determinants of Ethiopian banking performance	They all fail to include the important variables like capital structure and effective tax rate.
9	Amdemikael (2012),	The determinants of Ethiopian banking performance	
10	Mohana et al. (2012),	The determinants of Ethiopian banking performance.	

Table 6: Summary of Gaps Identified

Conclusion

This investigation highlights the existence of notable gaps within the scholarly work on factors affecting bank performance, identifying areas lacking in comprehensive evidence, nuanced methodologies, and focus on specific banking populations. By zeroing in on the determinants of profitability for banks in Zambia before and amid the COVID-19 pandemic, this study aims to fill a critical void in our understanding. This endeavor is poised to enrich academic discussions and yield actionable insights for those at the helm of policymaking and bank management, especially in navigating the uncertain waters of the banking industry during such unprecedented times.

Moreover, the body of existing literature, while extensive, presents a kaleidoscope of findings that sometimes diverge or even contradict each other, signaling an absence of consensus on what precisely influences bank performance. This research attempts to bridge this divide by focusing on Zambian-owned banks, shedding light on the significance of banking and financial market dynamics over macroeconomic variables in determining profitability margins during the pandemic era. Given the scant attention paid to the impact of COVID-19 on the profitability of local banks, this study not only ventures into relatively uncharted territories but also sets the stage for future inquiries in this critical area of financial research.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

“Research Methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically.” (Kothari, 2000:10). “Research methodology refers to the various sequential steps to be adopted by researcher in studying a problem with certain object/ objects in view.”(Kothari, 1994: 19)

Researchers not only need to know how to develop certain tests, how to calculate the mean, mode, median, standard deviation, but they also need to know which of these methods or techniques are relevant and indicate & why research mythology basically describes the methods, processes tools & techniques applied in the entire process of scientific research.

The methodology includes the various steps that are adopted by a researcher in studying the research problem along with the logic behind them. In this chapter, the researcher concentrates on the methods that were adopted throughout the study to accomplish the research objectives.

It includes the research design adopted to examine the determinants of bank profitability, the type of data used and the sampling design employed to collect the data, the methods employed to analyze the data and the model specifications.

3.2 Research Philosophy

The study adopted the **positivism paradigm orientation**. The positivist paradigm, also known as positivism, is a philosophical stance that emphasizes that knowledge should be based on natural phenomena and their properties and relations as verified by the empirical sciences. This paradigm upholds the idea that only scientific knowledge derived from empirical evidence, such as experiments and observations, is of real value, and that phenomena outside of this realm cannot be reliably understood. It also holds that the research study should begin with gathering of information rather than speculation. (Hammersley, M. 2013)

3.3 Research Design

“Research design is the plan, structure, and strategy of investigation conceived so on to obtain answers to research questions & to control variance. (Karlinger, 1986:59), A research design is the arrangement of condition for collection and analysis of data in a manner that aims to combine relevance to the research process with economy in procedure. (Cellith, &Jahoda, 1995:50)

The study adopted the **explanatory research design**. This design will be adopted because explanatory design is used to explain and interpret quantitative results by collecting and analyzing data (Creswell, 2009). The research relied on published audited financial statements for Banks.

Some financial & statistical tools have also been applied to examine facts and descriptive techniques have been adopted to evaluate financial performance of banks.

3.4 Research Approach

The study adopted **the deductive research approach**. This approach will be adopted because, in the deductive research approach, the researcher starts with an abstract, logical relationship among concepts and then move(s) toward concrete empirical evidence (Ali, 1998)

The study adopted **the quantitative research approach**. “In a quantitative project, the problem is best addressed by understanding what factors or variables influence the outcome” (Creswell, 2014). This approach will be adopted because the quantitative research approach is research that emphasizes numbers and figures in the collection and analysis of data. Imperatively, the quantitative research approach can be seen as being scientific.

Panel Data Analysis was used in this study. In economics, panel data analysis is widely used to study the behavior of various micro and macro-economic variables (Arellano and Bond 1991). Most panel studies are designed for **quantitative analysis** and use structured survey data.

3.5 Research Strategy

The study adopted the **archival research strategy**. Archival research is a method of research which involves identifying, evaluating, and synthesizing primary sources collected from archives. An archive in this context refers to a collection of historical documents or records providing information about a place, institution, or group of people. This archival strategy was adopted because the archival research strategy facilitates the investigation of documents and textual materials produced by and about organizations (Ventresca & Mohr, 2017).

3.6 Study Sites

The study was conducted on financial statements collected from Bank of Zambia website focusing on *Zambian Owned Banks*.

3.7 Study Population

In this study, the conceptual framework distinguishes between "population" and "sample." The "population" refers to the entire set of entities relevant to the research question, which, in this context, encompasses all commercial banks operating in Zambia. As of the latest data, Zambia hosts a dynamic banking sector with several commercial banks contributing to its financial landscape. For the purpose of this research, however, the study concentrates on a smaller, more manageable subset of this population, known as the "sample."

Given the practical constraints of conducting a comprehensive study across financial statements for the entire banking sector, the research zeroes in on a select financial statements for the group of banks. These banks were chosen based on specific criteria including their market reputation, the accessibility of their audited financial statements, and the need to keep the study within a feasible scope.

To provide a focused analysis, the study homes in on financial statements for three particular banks: *First Alliance Bank (FAB)*, *Indo Zambia Bank*, and *Zanaco*. The study population therefore consists of all the financial statements from the three banks spanning the years 2013 to 2021 (this constitutes 27 financial statements). This selection represents a mix of banks that not only have a significant presence in the Zambian banking sector but also vary in terms of their operational scale and market segments, thereby offering a rich comparative perspective on financial performance within the country.

It's pertinent to mention that Zambia's banking sector is comprised of both locally owned banks and international subsidiaries, with a total exceeding 18 commercial banks as per the latest data available from the Bank of Zambia. This broader population includes banks of various sizes, ranging from large multinational corporations to smaller, domestically focused institutions.

The period was chosen to provide a comprehensive overview of the banks' financial performance over time, capturing trends and identifying determinants of profitability in the Zambian context. By examining this sample, the study aims to shed light on broader patterns and dynamics within Zambia's banking sector, contributing valuable insights into the factors that influence bank profitability in an emerging market setting.

3.8 Sampling Technique

The sampling technique used in this study **periodic sampling**. This technique was used because it involves choosing data points based on a regular interval schedule, depending on the length of the study period and the nature of the data being analyzed. This method helps in maintaining a consistent approach to data collection across the entire study period. The study period was from 2013 to 2021 and the data being analysed was financial statements for individual banks.

3.9 Study sample

In this study, the focus will be on the analytical & comparative study of financial performance of 3 locally owned banks. The financial statements from three banks covering the years from 2013 to 2021. Each year's data for each bank serves as a distinct observation point, providing a time series for each bank. For each bank, the annual financial statements were analyzed over a nine-year period, leading to a total of 27 data points.

3.10 Nature and Data Sources

This study primarily shall utilise **secondary data** to construct its analytical framework. Data shall be collected for the years 2013 to 2021, which are crucial for this investigation, will be carefully extracted from the audited financial statements, specifically the Balance Sheet and Profit & Loss accounts, as presented in the annual reports of the banks under study.

To augment the depth of our analysis and to ensure a thorough understanding, supplementary data have been acquired from various digital sources. This supplementary data comprises a broad spectrum of resources, including academic journals, economic publications, management-focused literature, and a range of both published and unpublished materials found across several databases and online resources.

Audited Financial Statements were adopted from the Bank of Zambia website as at December 2021 and different Banks website. The financial Statements included the balance sheet, income statement, and cash flow statement. These documents provided comprehensive details about a bank's financial status, including assets, liabilities, and revenue, expenses, and cash flows.

Secondary data offers several advantages, as noted by Stewart and Kamins (1993) and further discussed by Li Yuqi (2007). It tends to be of high quality and facilitates longitudinal studies,

offering a stable and accessible data source that can be easily verified by other researchers, thereby enhancing the reliability and transparency of the research findings.

3.11 Statement of Economic Theory

The profitability of banks can be theorized to depend on several internal and external factors. Internal factors might include financial ratios such as Debt to Equity Ratio (DER), Loan to Deposit Ratio (LDR), Deposit to Asset Ratio (DTAR), Equity to Asset Ratio (EAR), and Debt to Asset Ratio (DAR). External factors could include economic conditions like interest rates and inflation.

The theory posits that these factors impact Return on Assets (ROA) and Return on Equity (ROE).

3.12 Specification of the Mathematical Model of the Theory

The relationship can be mathematically modeled as:

$$ROA = f(DER, LDR, DTAR, EAR, DAR, X)$$

$$ROE = g(DER, LDR, DTAR, EAR, DAR, X)$$

Where X represents external factors such as macroeconomic variables. Let's break down the potential meaning of these variables and the likely governing theory:

1. **ROA (Return on Assets):** A financial ratio that indicates how profitable a company is relative to its total assets. ROA gives an idea of how effective management is at using its assets to generate earnings.
2. **DER (Debt to Equity Ratio):** A measure of a company's financial leverage, calculated by dividing its total liabilities by its stockholders' equity. It indicates the proportion of equity and debt the company uses to finance its assets.
3. **LDR (Loan to Deposit Ratio):** In banking, this ratio is used to assess a bank's liquidity by comparing its total loans to its total deposits. It helps in understanding how much of the bank's deposits are tied up in loans, which can be riskier assets.
4. **DTAR (Debt to Asset Ratio):** This ratio measures the percentage of a company's assets financed by debt. A higher ratio means more leverage and higher risk.

5. **EAR (Earnings Assets Ratio):** Likely a measure of how much of a company's assets are earning revenue, common in financial and particularly banking sectors.
6. **DAR (Debt to Revenue Ratio):** This might be a less standard acronym but could represent a metric that relates debt levels to income or revenue, providing insights into debt management efficiency.
7. **X:** This variable is unspecified and could represent any number of other factors that might influence ROA, such as economic conditions, industry-specific factors, or operational efficiency metrics.

The model is grounded in **Corporate Finance Theory**, particularly focusing on corporate finance and financial management in banking. *Corporate finance theory* encompasses the principles and practices that govern how companies handle their financial resources to maximize shareholder value. This theory addresses various aspects of finance including capital structure, dividend policy, investment decisions, and working capital management. It also considers the mechanisms by which companies raise funds through equity and debt, and how these decisions impact overall corporate strategy.

Key Concepts in Corporate Finance Theory:

1. Capital Structure Theory:

Modigliani-Miller Theorem: Proposed by Franco Modigliani and Merton Miller in 1958, this theorem states that in a perfect market, the value of a firm is unaffected by its capital structure. However, when factors like taxes, bankruptcy costs, and agency costs are introduced, capital structure can significantly affect a firm's value. (Modigliani, F. 1958)

Trade-Off Theory: This theory suggests that firms balance the benefits of debt (such as tax shields) against the costs of potential financial distress. (Myers, S. C. 1984)

Pecking Order Theory: Developed by Stewart Myers, this theory posits that companies prioritize their sources of financing (from internal financing to equity) according to the principle of least effort, or least resistance, preferring to raise equity as a last resort. (Myers, N. S. 1984)

2. Dividend Policy:

Theories related to dividend policy explore how and why companies decide to return profits to shareholders through dividends or stock repurchases. Issues such as dividend irrelevance (in perfect markets), signaling effects (suggesting performance through dividends), and bird-in-the-hand theory (investors might value dividends more than future potential growth) are crucial here. (Gordon, M. J. 1959)

3. Investment Appraisal:

This involves assessing the profitability and risk of proposed investments. Key techniques include Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period. These methods help in determining whether a project adds value to the company.

4. Working Capital Management:

Effective management of working capital (including management of inventories, receivables, and payables) ensures that the company maintains sufficient cash flow to meet its short-term operational costs and debt obligations.

5. Behavioral Corporate Finance:

An emerging field that considers psychological factors affecting investor and manager behavior. It challenges the traditional assumption of rational decision-making in corporate finance.

3.13 Specification of the Econometric Model of the Theory

The assessment of bank profitability often revolves around key metrics such as Return on Assets (ROA) and Return on Equity (ROE).

In our study, we embrace a holistic approach by considering all two profitability metrics as dependent variables, providing a thorough examination of bank performance. The analysis incorporates two categories of independent variables: bank-specific and country-specific factors. The bank-specific characteristics under consideration include the capital ratio, bank size, management efficiency, credit risk, diversification, and liquidity ratio. On the other hand, the country-specific factors comprise macroeconomic variables such as per capita GDP, broad money growth rate, inflation rate, and corruption perception.

To investigate the factors determining the profitability of locally owned banks in Zambia, we propose an econometric model grounded in a theoretical framework. This model is designed to estimate the impact of the aforementioned independent variables on the profitability measures (ROA and ROE) of Zambian banks, offering insights into the dynamics influencing the financial success of these institutions.

The profitability determining factors of the bank profitability for Zambia Owned Banks are estimated by the following models; we specify the following econometric model based on the theoretical framework.

The econometric model could be specified as:

$$\textbf{Model-1: } ROA_{it} = \alpha_i + \beta_1(DAR)_{it} + \beta_2(DTAR)_{it} + \beta_3(EAR)_{it} + \beta_4(DER)_{it} + \beta_5(LDR)_{it} + \beta_6Xi + \epsilon_i$$

Equation 10: Model 1

$$\textbf{Model-2: } ROE_{it} = \alpha_i + \beta_1(DAR)_{it} + \beta_2(DTAR)_{it} + \beta_3(EAR)_{it} + \beta_4(DER)_{it} + \beta_5(LDR)_{it} + \beta_6Xi + u_i$$

Equation 11: Model 2

Where,

- α = Intercept of the model;
- i = Index of Banks;
- t = Time index;
- β_k = Regression Coefficient to be estimated;
- u_{it} = Random error term.
- ROA** = Return on Asset;
- ROE,** = Return on Equity;
- DTAR** = Deposit to Asset Ratio;
- BS,** = Bank Size;
- DER,** = Debt to Equity Ratio;
- LDR,** = Loan to Deposit Ratio;
- DAR** = Debt to Asset Ratio;

EAR, = Equity to Asset Ratio;

where ϵ_i and u_i are the error terms representing unobserved factors affecting ROA and ROE, respectively.

3.14 Obtaining the Data

Data for this analysis was collected from financial statements of banks for the period of 2014 to 2021 and economic databases that include relevant macroeconomic indicators. Data on financial ratios can be obtained from annual reports, while macroeconomic data might come from central banks or international financial organizations like the Bank of Zambia.

3.15 Estimation of the Parameters of the Econometric Model

The study adopted an Ordinary Least Squares regression for parameter Testing. Parameter estimation is usually performed using Ordinary Least Squares (OLS) regression, assuming the model meets the Gauss-Markov assumptions, which are suitable estimation techniques for Panel Data. Ordinary Least Squares (OLS) regression is a fundamental statistical method used for estimating the unknown parameters in a linear regression model. OLS regression minimizes the sum of the squared differences between observed values and the values predicted by the linear model. It's widely used in econometrics, statistics, and data science for hypothesis testing and prediction.

OLS Regression Model

Given a dataset with a dependent variable Y and one or more independent variables X_1, X_2, \dots , the linear regression model can be written as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \epsilon$$

Where $\beta_0, \beta_1, \dots, \beta_k$ are parameters to be estimated, and ϵ is the error term.

Estimation of Parameters

OLS estimates these parameters by minimizing the sum of the squared residuals (SSR), where a residual is the difference between an observed value and the value predicted by the model. Mathematically, this is represented as:

$$\text{Minimize } SSR = \sum_{i=1}^n (Y_i - (\beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki}))^2$$

3.16 Hypothesis Testing

In this stage, hypotheses regarding the impact of each variable on ROA and ROE are tested. For example, the study tested whether the coefficient of DER is significantly different from zero in predicting ROA and ROE, using t-tests for each coefficient under the regression models.

Once the parameters β_i are estimated, hypothesis testing typically involves testing the null hypothesis that each coefficient is zero (i.e., the variable has no effect) against the alternative hypothesis that it does not equal zero (i.e., the variable has an effect).

1. **Test Statistic:** The test for each coefficient β_i uses a t-statistic.
2. **Decision Rule:** If the absolute value of the t-statistic is greater than the critical value from the t-distribution with $n-k-1$ degrees of freedom (where n is the number of observations and k is the number of predictors), the null hypothesis is rejected.

Assumptions

For the OLS estimates to be the best, linear, unbiased, and efficient (BLUE) estimators, certain assumptions must be met:

1. **Linearity:** The relationship between the dependent and independent variables is linear.
2. **Independence:** The residuals are independent.
3. **Homoscedasticity:** The residuals have constant variance.
4. **Normality:** The residuals are normally distributed.
5. **No multicollinearity:** The independent variables are not too highly correlated.

3.17 Forecasting or Prediction

Using the estimated models, predictions about future profitability based on expected values of the predictors can be made. For instance, predicting ROA and ROE for the upcoming financial year based on projected financial ratios and economic conditions.

3.18 Using the Model for Control or Policy Purposes

The model can inform bank management and policymakers. For instance, understanding which variables are significant predictors of profitability can help in strategic planning, risk management, and policy formulation aimed at enhancing bank performance. For example, if higher DER negatively impacts ROE significantly, a bank may decide to control its debt levels more stringently. Additionally, regulators might use such models to assess the financial health of banks more broadly and devise policies to enhance the stability of the financial system.

This framework offers a comprehensive approach to analyzing the determinants of bank profitability and can be adjusted based on the specific interests and data availability of the researcher or the analyst.

3.19 Data Analysis Instruments And Procedures

The researcher used panel data because by combining time series of cross section observations, panel data give more informative data, more variability, less collinearity among variables, more degrees of freedom and more efficiency (Gujarati,2004).

Various financial & statistical tools have been used to meet the objective of the research. The data analysis is mainly based on pattern & nature of available data. Due to limited time & resources, simply analytical statistical tools such as percentage, graph, and Karl Person's coefficient of correlation are used in this study. Likewise, some financial tools such as ratio analysis & trend analysis have also been used for financial analysis. The various calculated results obtained through financial & statistical tools are tabulated under the different heading. Then they are compared with each other to interpret the results

E-views software is cast off to evaluate all models and investigations as panel data analysis tools. The Random-Effect Model, Fixed Effect Model, and Least Square Model were employed in this investigation. Error term, intercept, and coefficient regression are examples of specific assumptions (Kennedy, 2008).

The Hausman experiment was utilized in this study to compare the results of the fixed effect and random effect specifications. However, the aforementioned regression models have been presented in this regard. The panel data regression model was used to look at specific aspects of banks as well as macroeconomic issues that influence profitability.

The findings were presented by using tables and graphs by using Excel 2003 and Eviews. Correlation analysis will be used to test relationships. Both Bivariate and multivariate analysis will be used to test causality.

In case of the descriptive statistics, the mean, standard deviation, maximum and minimum values were used to analyze the trends of the data while the correlation matrix was used to show the relationship exist between the variables used in the study.

Moreover, the diagnostic tests were be undertaken in order to check the validity of the model and fulfill the assumption of the Classical Linear Regression Model

3.20 Pre-Estimation Tests and Post Estimation Tests

The justification for incorporating both pre-estimation and post-estimation tests in the research project "Assessing Profit Determinants of Zambian-Owned Banks Pre and Post the COVID-19 Era" is well-founded and methodologically sound. Here's why these tests are critical:

Pre-Estimation Tests Justification

1. **Heteroscedasticity Test:** This test is essential as heteroscedasticity (unequal variance of residuals) in regression models can lead to inefficient estimates, which might give misleading inferences about statistical significance. By using Breusch-Pagan tests, we ensure that standard errors are correctly estimated, leading to reliable hypothesis tests. Based on the Model assumptions above, it was assumed that the models have heteroscedastic errors which are likely to produce incorrect estimates.
2. **Multicollinearity Test:** Multicollinearity among predictors can inflate the variance of the coefficient estimates, making them unstable and difficult to interpret. Utilizing VIF or Condition Index helps in detecting multicollinearity, allowing for corrective measures such as removing or combining correlated predictors. Based on model assumption 3 of there is no multicollinearity or perfect collinearity, Because there is only one independent variable in a simple linear regression model, this assumption will hold true by default.
3. **Autocorrelation Test:** In time-series data, autocorrelation of residuals violates the assumption of independent errors and can bias the test statistics. Employing tests like Durbin-Watson ensures that the estimates of coefficients are not spurious due to residual correlations.

Post-Estimation Tests Justification:

- 1. Goodness-of-Fit Tests:** These tests are crucial for assessing the explanatory power of your model. Metrics like R-squared and adjusted R-squared inform about the percentage of the response variable variation that is explained by a linear model. AIC and BIC help in model selection, especially when comparing models with different numbers of predictors.
- 2. Residual Analysis:** Analyzing residuals for normality and homoscedasticity confirms the assumptions of the linear regression model. This is vital as non-normal or heteroscedastic residuals can affect conclusions about relationships between variables.
- 3. Endogeneity Tests:** Endogeneity can lead to biased and inconsistent parameter estimates, which misrepresent the causal relationships. Using tests like Durbin-Wu-Hausman or applying instrumental variables can help correct for any potential endogeneity, providing more valid estimates.

Implementing these tests in the research design ensures that the models are robust, the estimates are reliable, and the conclusions drawn from the study reflect true relationships, making your findings relevant and valuable, especially in the volatile economic conditions post-COVID-19.

3.21 Diagnostic Test

Regression Analysis:

This is the primary method used to examine the relationship between independent variables and dependent variables. Regression analysis helps in understanding the impact of one or more predictor (independent) variables on a criterion (dependent) variable.

Coefficient Significance Testing (p-values):

The significance of the regression coefficients is tested, typically through t-tests, where p-values are computed to determine if the observed coefficients significantly differ from zero (no effect). Checking p-values helps in determining the statistical significance of each predictor. A low p-value (usually less than 0.05) indicates that the effect of the independent variable on the dependent variable is statistically significant, suggesting a real relationship that is not due to random chance.

Hausman Test

The Hausman test was used in statistics to determine whether an estimator has the desired properties that make it the best choice for analyzing a given set of data. The Hausman test was used to compare the coefficients of two models: one that is consistent under both the null and alternative hypotheses (typically a Fixed Effects model), and one that is more efficient under the null hypothesis but inconsistent under the alternative (typically a Random Effects mode).

3.22 Statistical Tools

Various statistical tools to this study will be drawn out to make the conclusion more reliable according to the available financial data. For this, following statistical tools are used.

Arithmetic Mean (Average):

Average is statistical constants, which enable us to comprehend in a single effort of the whole. It represents the entire data by a single value. It provides the gist and gives eagle view to the huge mass of unwieldy numerical data (Gupta, 2001:357). It is calculated as:

$$\bar{x} = \frac{\sum x}{n}$$

Equation 13: Average (Mean)

Where,

- \bar{x} =
- Arithmetic Average
- $\sum x$ = Summation for total values of the variable/observation
- N = Number of items

Standard deviation (S.D)

S.D is defined as the positive square root of the mean of the square of the deviations taken from the arithmetic mean. It is denoted by 'sigma.'

$$S.D (\delta) = \sqrt{\frac{\sum (X-\mu)^2}{N-1}}$$

Equation 14: Standard Deviation

Where;

- μ = mean
- N = number of item

Correlation Coefficient (r):

Correlation may be defined as the degree of linear relationship existing between two or more variables. Variables are said correlated when the change in value of one variable results change in another variable. Simple partial and multiple are type of correlation. Correlation may be positive, negative or zero. Among the various methods of finding out coefficient of correlation, Karl person's method is applied in the study.

The result of coefficient of correlation is always between +1 and -1.

When,

- $r = +1$; It means there is perfect positive relationship between two variables.
- $r = 0$; it means there is no relationship between two variables.
- $r = -1$; It means there is perfect negative relationship between two variables.

$$r = \frac{(N\sum xy - \sum x \sum y)}{\sqrt{N\sum x^2 - (\sum x)^2} \times \sqrt{N\sum y^2 - (\sum y)^2}}$$

Equation 15: The Person's formula

Where;

- r = coefficient of correlation
- x = independent variable
- y = dependent variable
- N = number of period

Probable Error of the co-efficient of correlation

The probable error of the coefficient of correlation helps in interpreting its value, with the help of probable error, it is possible to determine the reliability of the value of the coefficient is so far as it depends on the conditions of random sampling. The probable error of the coefficient of correlation is obtained as follows;

$$P.E._r = 0.6745 \times \frac{1-r}{\sqrt{N}}$$

Equation 16: Coefficient of correlation

Where;

- P.E.r = probable error of co-efficient of correlation.
- N= number of pair observation

In order to conclude whether the co-efficient of correlation is significant or not the following points should be kept in mind.

- If $r < P.E$, It is not at all significant.
- If $r > 6 * P.E$, It is definitely significant.
- If the P.E is not much and if the 'r' is 0.5 or more it is generally to be significant.

Coefficient of Determination:

The coefficient of determination is the measure of the degree of linear association or correlation between two variables, one of which happens to be independent and other being dependent variable. In other words, coefficient of determination measures the percentage of total variation in dependent variable. The co-efficient of determination can have value ranging from zero to one. Coefficient of determination is the square of the co-efficient of correlation.

Symbolically,

$$R^2 = r^2$$

Where,

- R^2 = coefficient of Determination
- R= coefficient of Correlation

Return on Asset (ROA);

Net profit refers the profit after interest and taxes. It is also known as return on total assets (ROA). This ratio evaluates the efficiency of company in utilizing and mobilizing of assets and its survival. It is useful for measurement of the profitability of all financial resources invested in the bank

assets. It also provides the necessary foundation for the company to deliver a good return on equity. Higher ROA indicates higher efficiency in utilization of total assets and vice-versa. ROA is calculated by dividing the amount of NP by total assets.

$$ROA = \frac{\text{Total Profits}}{\text{Total Assets}}$$

Equation 17: ROA Formulae

Return on Equity (ROE)

Net worth or shareholders equity refers to the owners claim on the assets of the bank. It can be found by deducting total liabilities from total assets (excluding intangible assets and accumulated losses). This ratio measures the profit earned by the commercial banks by utilizing owner's equity and there by generating return on satisfy the owners. This ratio indicates how well the banks have used the resources of the owners. Higher the ratio indicates sound management, efficiency, and wealth maximization of the banks, which in turn is the wealth maximization of the banks. It is calculated by dividing net profit by net worth. This is expressed as follows.

$$ROE = \frac{\text{Total Profits}}{\text{Total Equity}}$$

Equation 18: ROE Formulae

DTAR = Deposit to Asset Ratio;

According to Kwan (2000), deposits to asset ratio measures the magnitude of assets being funded by public deposits. He further stated that the Deposit-to-Asset Ratio tests whether banks that have more deposits incur additional operating costs to attract deposits. In the context of Banks, deposits to assets ratio measures the relative portion of the banks total assets that is funded by deposits and gives an informed analysis of the role of deposits as a funding source (Mix Market, 2011).

Total Deposit to-Total Assets Formula

The total deposit-to-total assets formula is the quotient of total deposit divided by total assets. As shown below;

$$DTA = \frac{\text{Total Deposit}}{\text{Total Assets}}$$

Equation 19: Deposit to Asset Ratio (DTA)

This calculation generally results in ratios of less than 1.0 (100%). A proportionally larger deposit base as a percentage of total assets will typically lead to an overall lower cost of funds, assuming that the deposits program is cost efficient in its operational and financial expense of deposits ratios. The higher the ratio, the more the banks must rely on external funding, which is often a more costly source of funding than deposits. Banks may also effectively use local depositors as in the case of Irish loan funds (Hollis & Sweetman, 2007) not just for funding, but also because of the important discipline that depositors can impose on expenses management—which has an impact on profitability and financial sustainability. Muriu (2011) found a positive significant relationship between deposits to assets ratio and Banks sustainability.

Debt to Equity Ratio (DER);

Debt equity ratio examines the relative claims of creditors and owners against the firm assets. Alternatively, the debt equity ratio indicates the combinations of debt capital and equity capital fund to the total investment.

The information needed to calculate the D/E ratio can be found on a listed company's balance sheet. Subtracting the value of liabilities on the balance sheet from that of total assets shown there provides the figure for shareholder equity, which is a rearranged version of this balance sheet equation:

$$DER = \frac{\text{Long Term Debt} + \text{Short Term Debt}}{\text{Total Assets}}$$

Equation 20: Debt to Equity Ratio

Loan to Deposit Ratio (LDR);

The loan-to-deposit ratio (LDR) is used to assess a bank's liquidity by comparing a bank's total loans to its total deposits for the same period. The LDR is expressed as a percentage. If the ratio is too high, it means that the bank may not have enough liquidity to cover any unforeseen fund requirements. Conversely, if the ratio is too low, the bank may not be earning as much as it could be.

To calculate the loan-to-deposit ratio, we divide a bank's total amount of loans by the total amount of deposits for the same period. You can find the figures on a bank's balance sheet. Loans are listed as assets while deposits are listed as liabilities.

$$LDR = \frac{\text{Total Loans}}{\text{Total Deposits}}$$

Equation 21: Loan to Deposit Ratio

A loan-to-deposit ratio shows a bank's ability to cover loan losses and withdrawals by its customers. Investors monitor the LDR of banks to make sure there's adequate liquidity to cover loans in the event of an economic downturn resulting in loan defaults.

Debt to Asset Ratio (DAR)

This ratio exhibits the relationship between creditors fund and owners capital. This ratio shows the proportion of outside fund used in financing total assets. It also provides security/ financial safety to the outsider's that is potential shareholder, depositors or investors. Higher debt ratio indicates higher financial risk as well as increasing claims of outsiders in total assets and lower ratio indicates lower financial risk as well as decreasing claims of outsider over the total asset of the firm. Generally, 1:2 ratios are considered good however, no hard and fast rule is prescribed. This ratio implies a finance company success in exploiting debt to more profitable areas.

The Debt to Asset ratio, calculated by dividing a bank's total debt by its total assets, is a fundamental indicator of a bank's financial leverage.

$$DAR = \frac{\text{Total Long Term Debt} + \text{Total Short term Debt}}{\text{Total Assets}}$$

Equation 22: Debt to Asset Ratio

A higher ratio suggests that a bank has funded a significant portion of its assets with debt, whereas a lower ratio indicates a greater reliance on equity and internal resources. The importance of this ratio lies in its ability to signal the financial health and operational risk of a bank, which are intrinsically linked to its profitability (Rose and Hudgins, 2013).

Equity to Asset Ratio (EAR);

Equity to Asset Ratio (EAR) is a critical financial metric that offers deep insights into a bank's financial health, operational efficiency, and, notably, its profitability. This ratio, which compares a bank's total equity to its total assets, serves as a barometer for evaluating a bank's leverage and its capacity to sustain profits under varying economic conditions. Understanding the intricate relationship between the Equity to Asset Ratio and bank profitability requires an exploration of the foundational principles of bank finance, the implications of leverage, and the influence of regulatory frameworks and economic environments on banking operations.

$$EAR = \frac{\text{Total Equity}}{\text{Total Assets}}$$

Equation 23: Equity to Asset Ratio

The Equity to Asset Ratio is calculated by dividing a bank's total equity by its total assets. This ratio is pivotal in assessing a bank's financial leverage, indicating how much of the bank's assets are financed by equity as opposed to debt. A higher ratio suggests that a bank has a strong equity base, which can absorb losses and sustain operations during adverse economic conditions, thereby enhancing its stability and long-term profitability (Berger, 1995).

Trend analysis:

Trend analysis describes the average relationship between series where the one series related to time and other series to the value of the variable. It generally shows that the line of the best-fit or straight line is obtained or not. The line of the best fit describes the changes in a given accompanying a unit change in time. Another word, it gives the best possible mean values of dependent variable for a given value of independent variable. For calculation of the line of the best fit following equation should be kept in mind.

$$Y_c = a + bx$$

Equation 24: Trend Analysis

Where;

Y_c = the estimated value of y for given value of x obtained from the line of regression of y on x .

- a = intercept

- y =mean of y value
- b =slope of line/rate of change
- x = the variable in time series analysis represent time.

The term best fit is interpreted in accordance with the principle of least squares, which consists in minimizing the sum of squares of the residual or the errors of estimates i.e. the deviation between the given observed value of the variable and their corresponding estimated values as given by the line of best fit.

This topic will be used to forecast the ratios between net profit and deposit, net profit and investment, net profit and loan and advances of the banks for next five year on the base of past five years. The analysis is done under limited factors, which are as follows.

1. The company will remain unchanged as of present the stage.
2. Banks will run as of present position.
3. The guidelines by Bank of Zambia (BOZ) for Banks will remain unchanged.
4. The forecast will be true only when the limitations of least square method are carried out.
5. The main assumption is that other factors are constant.

3.23 Validity and Reliability

The research ensured for validity and reliability. **Validity** and **reliability** in research is crucial for ensuring that the methods and conclusions of a study are trustworthy and accurately reflect the phenomena being investigated. In this study, I used content *validity*, *construct validity*, and the *Principal Components Analysis (PCA)*.

Content validity refers to the degree to which a measurement tool, such as a survey, assessment, or test, includes items that are representative of all facets of the variable or concept it intends to measure. This type of validity is particularly important in the development phase of the measurement tool.

Construct validity is about how well a test or tool measures the construct that it was designed to measure. This form of validity is seen as one of the most significant forms of validation efforts because it focuses directly on the foundation of the research hypotheses and the theoretical concepts.

Principal Components Analysis (PCA) is a statistical technique used to reduce the dimensionality of a dataset, increasing interpretability while minimizing information loss. It transforms the original variables into a new set of variables, which are linear combinations of the original variables and are uncorrelated with each other. These new variables are the principal components (PCs).

In summary, Content validity ensures that the measure includes all necessary elements of the concept being measured. Construct validity confirms that the measure actually assesses the theoretical construct it claims to assess. PCA assists in these validity assessments by clarifying data structure, helping validate the constructs through empirical data. Each plays a crucial role in the development and validation of research tools, ensuring the accuracy and applicability of the findings.

CHAPTER FOUR: DATA PRESENTATION AND RESULTS

In this chapter, we delve into the data of selected banks, presenting and analyzing it in alignment with the goals outlined in the introductory chapter. To ensure the data is both realistic and comprehensive, we employ a blend of qualitative analysis, financial ratios, and statistical methods.

While numerous ratios exist for such analysis, limitations and constraints have necessitated the selection of specific ratios to evaluate the strengths and weaknesses of the sample banks effectively.

Additionally, this chapter sets the stage for unveiling key findings and offering recommendations for further research, which will be elaborated upon in the subsequent chapter. Through this analytical process, we aim to create a coherent link between all chapters of this study.

To assess the strengths, weaknesses, and overall financial performance of the sample banks, various ratios and variables have been calculated, detailed as follows:

4.1 Overview of Key Financial Ratios:

From this study, the ratios used have been defined and used as follows;

1. **ROA (Return on Assets)** measures how efficiently a company uses its assets to generate net income.
2. **ROE (Return on Equity)** indicates how effectively equity is used to generate profits.
3. **DTAR (Debt to Asset Ratio)** shows the proportion of a company's assets financed by debt.
4. **DER (Debt to Equity Ratio)** illustrates the degree to which operations are funded by debt versus shareholders' equity.
5. **LDR (Loan to Deposit Ratio)** assesses a bank's liquidity by comparing its total loans to its total deposits.
6. **DAR (Debt to Asset Ratio)**, similar to DTAR, indicates the percentage of assets financed by debt.
7. **EAR (Equity to Asset Ratio)**, the inverse of DTAR, shows the proportion of a company's assets financed through equity.

4.2 Comparative Analysis

4.2.1 First Alliance Bank (FAB)

Analyzing the provided financial data of a company over an 8-year period (2014-2021), we can observe trends and shifts in its financial health and operational efficiency. The key components include Assets, Debt, Equity, Loans, Deposits, and Net Profit after Tax.

Table 7: Balance Sheet and P&L Data

Year	Assets	Debt	Equity	Loans	Deposits	Net profit after tax
2014	464,957,000.00	32,744,000.00	137,517,000.00	238,465,000.00	262,946,000.00	11,638,000.00
2015	693,354,000.00	549,399,000.00	143,955,000.00	371,553,000.00	442,696,000.00	6,438,000.00
2016	678,076,000.00	508,215,000.00	169,861,000.00	368,568,000.00	483,174,000.00	25,906,000.00
2017	751,660,000.00	561,178,000.00	190,482,000.00	354,647,000.00	531,353,000.00	19,150,000.00
2018	919,144,000.00	701,078,000.00	218,066,000.00	407,202,000.00	614,106,000.00	43,464,000.00
2019	940,577,000.00	706,218,000.00	234,359,000.00	415,034,000.00	657,982,000.00	14,826,000.00
2020	7,318,255,000.00	1,065,684,000.00	252,571,000.00	531,654,000.00	974,928,000.00	20,739,000.00
2021	145,503,000.00	1,201,145,000.00	253,885,000.00	447,577,000.00	1,083,859,000.00	9,363,000.00

Source: Banks Audited Financial Statements

Analyzing the financial data for First Alliance Bank from 2014 to 2021 reveals a narrative of rapid expansion followed by a significant contraction, framed by shifts in market conditions and strategic decisions. This story is told through trends in assets, debt, equity, loans, deposits, and net profit after tax, which together provide a comprehensive view of the bank's financial health and operational strategy over the years.

The Rise

Between 2014 and 2020, First Alliance Bank embarked on a clear path of aggressive growth. Assets grew remarkably from around 464.9 million in 2014 to an astounding 7.3 billion by 2020. This trajectory was mirrored in both loans and deposits, which similarly ballooned during this period. Loans increased from 238.5 million to 531.7 million, while deposits rose from 262.9 million to nearly 975 million. These figures reflect a strategic push towards expanding the bank's market reach and its capacity to handle a larger customer base, possibly through new branches, enhanced services, and broader product offerings.

The growth in equity from 137.5 million to 252.6 million also indicates sustained reinvestment and possibly the infusion of fresh capital, suggesting confidence among investors and a commitment to bolstering the bank's financial foundation.

The Peak

The peak of this growth arc came in 2018, where the bank reported a record net profit after tax of 43.5 million. This peak profit underscores a period of operational efficiency and possibly successful risk management and investment strategies, capturing the zenith of First Alliance Bank's expansion phase.

The Turning Point

However, 2020 marks a turning point. Despite the continued growth in physical metrics such as assets and loans, the net profit started showing signs of strain, with a noticeable dip to 20.7 million from a higher previous profit in 2018. This indicates underlying challenges—perhaps rising costs, increased competition, or the onset of market saturation.

The Contraction

By 2021, a dramatic shift occurred. Assets sharply decreased to 145.5 million, a stark contraction from the previous year. Similarly, both loans and deposits saw reductions, with loans decreasing to 447.6 million and deposits falling to 1.08 billion. This reduction could suggest several strategic responses, such as asset sell-offs, risk aversion tactics in loan distributions, or a loss of customer confidence leading to withdrawals of deposits.

Moreover, the bank's net profit after tax further declined to 9.4 million, signaling tightened operational margins. The increased debt load, which rose significantly to 1.2 billion, paints a picture of a bank perhaps over-leveraged, reflecting a need to support liquidity possibly due to the falling asset and deposit bases.

The financial journey of First Alliance Bank is a tale of ambitious growth fraught with subsequent challenges. The aggressive expansion may have overextended the bank's operational capacities or exposed it to greater financial risks, which became apparent when profits began to fall despite rising assets. The sudden contraction in 2021 begs questions about the sustainability of its previous

growth strategy and the impact of external economic factors, possibly including regulatory changes or market downturns.

Key Observations and Concerns

1. **Asset Volatility:** The drastic change in asset value in 2020 and 2021 requires further investigation to understand its causes (e.g., acquisitions, divestitures, or revaluations).
2. **Increasing Leverage:** The increasing debt, particularly against a backdrop of volatile profits, might indicate rising financial risk. The debt-to-equity ratio should be closely monitored to ensure the company doesn't become over-leveraged.
3. **Operational Efficiency:** The fluctuations in net profit, despite overall growth in assets and deposits, suggest varying operational efficiencies. It would be prudent to analyze operational costs, interest expenses, and non-performing loans (if applicable) to gauge the company's financial health better.
4. **Market Position and Strategy:** The expansion in loans and deposits suggests growth or a strong market position. However, the sustainability of this growth amidst increasing debt and fluctuating profits needs to be assessed, considering potential market and operational risks.

The financial overview from 2014 to 2021 reveals a complex picture of growth accompanied by increased leverage and profitability challenges. While the company has expanded its asset base and operations, as indicated by loans and deposits, the volatile profit figures and the dramatic shift in assets and liabilities in the last two years signal a need for a thorough review of the company's financial strategy and risk management practices.

Trend Analysis for FAB

Analyzing the provided financial data across various years (2014-2021) gives insights into the performance and operational trends of an entity, likely a financial institution given the types of metrics reported. The data includes Return on Assets (ROA), Return on Equity (ROE), Debt to Asset Ratio (DTAR), Debt to Equity Ratio (DER), Loan to Deposit Ratio (LDR), Debt to Asset Ratio (DAR), and Equity to Asset Ratio (EAR).

Table 8: Trend Balance Sheet Ratios for FAB

YEAR	ROA	ROE	DTAR	DER	LDR	DAR	EAR
2014	2.50%	8.46%	56.55%	23.81%	90.69%	7.04%	29.58%
2015	0.93%	4.47%	63.85%	381.65%	83.93%	79.24%	20.76%
2016	3.82%	15.25%	71.26%	299.19%	76.28%	74.95%	25.05%
2017	2.55%	10.05%	70.69%	294.61%	66.74%	74.66%	25.34%
2018	4.73%	19.93%	66.81%	321.50%	66.31%	76.28%	23.72%
2019	1.58%	6.33%	69.96%	301.34%	63.08%	75.08%	24.92%
2020	0.28%	8.21%	13.32%	421.93%	54.53%	14.56%	3.45%
2021	6.43%	3.69%	744.90%	473.11%	41.29%	825.51%	174.49%

Profitability Ratios (ROA & ROE):

2018 stands out as a year of high profitability, with the highest ROA and ROE in the period. This suggests effective asset utilization and equity management.

2021 shows an interesting contrast: while ROA significantly increases to 6.43%, ROE decreases to 3.69%, indicating a substantial shift in financial structure or operational impact that favored asset returns over equity returns.

Leverage Ratios (DTAR, DER, DAR):

2021 experiences an extraordinary surge in these ratios, especially DTAR and DAR, which could signal a dramatic increase in debt levels compared to assets, potentially indicating a major financial restructuring or a significant acquisition funded through debt.

Liquidity Ratio (LDR):

A decreasing trend over the years, with a sharp drop in **2021**, suggests a move towards higher liquidity or a change in the bank's lending policies.

Capital Structure (EAR):

The **2021** spike in EAR to 174.49% appears anomalous and warrants further investigation, as it suggests a disproportionate increase in equity compared to assets, which could be due to a data error or extraordinary corporate actions.

Year-specific Highlights:

2020 shows an anomalous dip in profitability (ROA at 0.28%), which could be attributed to external factors like economic downturns impacting asset yields.

2021 stands out for its dramatic shifts in all ratios, particularly in leverage and capital structure metrics, suggesting a potential recalibration of the company's financial strategy or response to an external crisis.

The data presents a company experiencing varying degrees of operational efficiency, profitability, and financial leverage across the years. The sharp fluctuations in 2020 and 2021 particularly highlight years of significant financial or operational stress or strategic redirection. The increases in leverage ratios coupled with the significant changes in profitability metrics in these years suggest external challenges or internal strategic shifts. It would be crucial to understand the context surrounding these years—whether these changes were due to market conditions, regulatory impacts, or strategic decisions aimed at restructuring the company’s financial or operational model.

In summary, while there were years of strong performance, particularly in profitability, the later years indicate significant changes that could impact the company’s long-term stability and require careful analysis and potentially strategic adjustments.

4.2.2 *Indo Zambia Bank Limited (Indo)*

Analyzing the provided data for Indo Zambia Bank over the years 2014 to 2021 gives us insights into the bank's growth and changes in its financial structure. The key elements presented are Assets, Debt, Equity, Loans, and Deposits.

Table 9: Balance Sheet and Profit and Loss Data for Indo

YEAR	Assets	Debt	Equity	Loans	Deposits
2014	2,382,269,120.00	1,798,647,945.00	583,621,175.00	799,000,000.00	1,645,000,000.00
2015	2,797,281,380.00	2,148,531,384.00	648,749,996.00	987,000,000.00	1,993,000,000.00
2016	2,948,463,330.00	2,248,461,830.00	700,384,550.00	1,012,592,884.00	2,067,870,636.00
2017	3,612,040,820.00	2,835,860,255.00	776,180,565.00	1,255,716,151.00	2,603,013,122.00
2018	4,441,154,132.00	3,568,050,550.00	873,103,582.00	1,710,012,172.00	3,305,477,096.00
2019	5,796,269,877.00	4,804,522,589.00	991,747,288.00	2,166,074,860.00	4,506,578,010.00
2020	10,016,138,447.00	8,871,573,809.00	1,144,564,638.00	2,696,609,165.00	6,570,772,409.00
2021	10,960,471,638.00	9,611,242,723.00	1,349,228,915.00	3,001,238,625.00	7,802,543,931.00

Source: Audited Financial Statements

The bank's assets show a consistent growth from 2.38 billion in 2014 to nearly 10.96 billion by 2021, more than quadrupling over the eight-year period. This indicates a solid expansion of the bank's operational size and capability. Alongside assets, debt has also increased significantly, from 1.80 billion in 2014 to 9.61 billion in 2021. This parallel increase suggests that a substantial portion of the asset growth was financed through debt.

Equity grew from 583.62 million in 2014 to 1.35 billion in 2021. While the equity has more than doubled, its growth rate is slower compared to assets, indicating that the bank has increasingly relied on debt to fuel its growth. Loans disbursed by the bank almost quadrupled, and deposits from customers more than quadrupled over the period. The growth in loans and deposits is a healthy sign of increasing customer base and lending activity, crucial for the bank's revenue.

To provide a deeper analysis, we can calculate some key financial ratios over these years:

Debt to Equity Ratio (DER): A measure of a company's financial leverage calculated by dividing its total liabilities by stockholders' equity. The increase in DER over time would indicate that the bank is taking on more debt relative to its equity, which could imply higher risk if not managed properly.

Loan to Deposit Ratio (LDR): This ratio is crucial for banks, indicating the bank's liquidity by comparing its total loans to its total deposits. An LDR too high can indicate that the bank might not have enough liquidity to cover any unforeseen fund requirements, whereas too low might suggest that the bank is not utilizing its deposits effectively.

Asset Growth Rate: The year-on-year growth rate of assets, which provides insight into how quickly the bank is expanding its operations and asset base.

The substantial increase in assets and loans indicates aggressive growth strategies, including expanding customer base and credit offerings. The increasing debt, while supporting growth, also suggests heightened leverage, which can introduce financial risk, particularly in volatile economic conditions.

The steady increase in equity suggests that the bank is also focusing on strengthening its financial health and potentially retaining earnings to support growth. The growth in deposits is a positive sign of customer trust and banking relationship development, crucial for the bank's sustainability.

Indo Zambia Bank has demonstrated significant growth from 2014 to 2021 across all major financial dimensions. The data suggests a strategy focused on leveraging debt to fuel expansion and an effective increase in its lending activities. However, the reliance on debt also calls for a careful assessment of financial risk management strategies to ensure long-term sustainability. The consistent increase in customer deposits and lending activity indicates a growing market presence and potentially increasing profitability. It would be beneficial to analyze the bank's income statement details, like net interest margin and non-interest income, for a comprehensive understanding of its financial performance.

Trend Analysis for Indo

Analyzing the trend analysis data for Indo Zambia Bank from 2014 to 2021, we observe various financial metrics that illustrate the bank's performance, financial structure, and efficiency. These metrics include Return on Assets (ROA), Return on Equity (ROE), Debt to Total Asset Ratio (DTAR), Debt to Equity Ratio (DER), Loan to Deposit Ratio (LDR), Debt to Asset Ratio (DAR), and Equity to Asset Ratio (EAR).

Table 10: Balance Sheet and P&L Data for Indo

YEAR	ROA	ROE	DTAR	DER	LDR	DAR	EAR
2014	1.93%	7.88%	69.05%	308.19%	48.57%	75.50%	24.50%
2015	2.90%	12.49%	71.25%	331.18%	49.52%	76.81%	23.19%
2016	1.82%	7.65%	70.13%	321.03%	48.97%	76.26%	23.75%
2017	3.02%	14.03%	72.06%	365.36%	48.24%	78.51%	21.49%
2018	3.15%	16.01%	74.43%	408.66%	51.73%	80.34%	19.66%
2019	3.08%	17.99%	77.75%	484.45%	48.06%	82.89%	17.11%
2020	2.09%	18.32%	65.60%	775.10%	41.04%	88.57%	11.43%
2021	2.54%	20.65%	71.19%	712.35%	38.46%	87.69%	12.31%

Source: Audited Financial Statements

Profitability

ROA fluctuates over the period, starting at 1.93% in 2014, peaking at 3.15% in 2018, and closing at 2.54% in 2021. ROA is a metric that indicates how efficiently the bank is at turning its assets

into net income. The fluctuations suggest varying operational efficiency over the years. **ROE** shows a generally upward trend, starting at 7.88% in 2014 and increasing to 20.65% by 2021. This metric indicates how well the bank uses equity financing to generate profits and reflects increasing profitability for equity holders over time.

Financial Structure and Risk

DTAR has minor fluctuations but generally indicates the bank's reliance on debt to finance its assets. A decrease in 2020 followed by an increase in 2021 suggests a strategic adjustment in the bank's capital structure. **DER** increases significantly, especially noticeable from 2019 to 2020. This rise indicates the bank is increasingly relying on debt compared to equity for financing, which could imply higher financial risk if not managed carefully.

Liquidity Ratio (LDR)

LDR shows a downward trend in the later years, especially from 2019 to 2021, suggesting the bank may be becoming more conservative in its lending or is accumulating more deposits relative to its loans. This could also reflect a strategy to maintain higher liquidity. **DAR** increases, particularly noticeable in 2020, indicating that the bank's assets are increasingly financed by debt.

EAR decreases over the period, particularly sharply from 2018 onwards, highlighting that equity makes up a smaller portion of the bank's asset financing strategy over time.

Implications and Insights

The increase in **ROE** alongside an increasing **DER** suggests that the bank's higher profitability may be driven by the increased use of debt, which can enhance returns but also introduces higher financial risk.

The fluctuating but generally increasing **ROA** indicates improving operational efficiency over time, but with periods of variability that suggest external market factors or internal management decisions impacting performance year over year.

The changes in **LDR**, **DAR**, and **EAR** in later years suggest a strategic shift in the bank's management of its assets, liabilities, and equity, likely reflecting a response to changing market conditions or a reevaluation of the bank's risk management and growth strategies.

Overall, the trend analysis of Indo Zambia Bank from 2014 to 2021 indicates a bank experiencing growth in profitability and operational efficiency, alongside an increasing reliance on debt financing. While this strategy has led to higher returns on equity, it also underscores the importance of careful risk management to maintain financial stability and sustain growth. The bank's decreasing reliance on equity financing, as shown by the EAR trend, coupled with the increasing DER, suggests a strategic shift that stakeholders should monitor closely for implications on the bank's long-term financial health and risk profile.

4.2.3 Zanaco

Analyzing the financial data for Zanaco over the period from 2014 to 2021 provides insight into the bank's growth, asset management, and financial health.

Table 11: Balance Sheet and P&L data for Indo

Year	Assets	Debt	Equity	Loans	Deposits
2014	6,663,803,000.00	5,662,897,000.00	1,001,106,000.00	3,138,506,000.00	5,053,720,000.00
2015	7,945,772,000.00	6,905,488,000.00	1,040,284,000.00	3,446,554,000.00	6,033,084,000.00
2016	8,001,804,000.00	7,130,864,000.00	1,024,052,000.00	3,187,597,000.00	6,256,182,000.00
2017	9,543,088,000.00	8,519,036,000.00	1,024,052,000.00	3,223,173,000.00	7,454,624,000.00
2018	10,614,067,000.00	9,793,159,000.00	820,908,000.00	4,207,022,000.00	8,899,546,000.00
2019	11,895,966,000.00	10,955,087,000.00	940,879,000.00	4,819,676,000.00	9,848,095,000.00
2020	19,377,363,000.00	18,163,116,000.00	1,214,247,000.00	48,284,000.00	15,712,069,000.00
2021	26,183,932,000.00	24,038,295,000.00	2,145,638,000.00	13,740,000.00	19,329,279,000.00

Source: Audited Financial Statements

There's a noticeable upward trend in the bank's assets, growing from 6,663,803,000 in 2014 to 26,183,932,000 in 2021. This significant increase indicates the bank's expansion and growth in its operational capacity.

The loans provided by the bank see an unusual dip in 2020, which could be attributed to the global financial situation or a strategic shift in the bank's lending practices. However, deposits consistently grow, indicating trust and confidence from the bank's customers.

The bank's debt closely follows the trend in assets, suggesting that much of the bank's growth has been financed through borrowing. This is not uncommon for banks but requires careful management to ensure sustainability.

The equity shows relatively modest growth until 2020, after which there's a significant increase. The jump in equity from 2020 to 2021 could be due to retained earnings, capital infusions, or revaluation of assets. Equity is crucial as it indicates the bank's net value and capability to absorb losses. **Loans to Deposits Ratio:** The ratio of loans to deposits decreases dramatically in 2020 and 2021, suggesting the bank has either significantly reduced its loan issuance or has accumulated a large amount of deposits in comparison. A lower loans to deposits ratio can indicate a conservative approach towards lending or a build-up of liquid assets.

Yearly Highlights and Concerns

2014-2019: The bank demonstrated consistent growth in assets, debt, and deposits. Loans also increased, although at a different pace, showing an expanding lending portfolio.

2020: Marks a significant departure from previous trends, especially in the loans provided, which drastically reduced. This year likely represents a strategic pivot or response to external factors such as economic downturns or regulatory changes.

2021: Shows a rebound in loans, albeit not to previous levels, alongside substantial increases in assets, debt, and equity. The significant rise in equity is a positive indicator of the bank's strengthened financial position.

Implications

The growth in assets and deposits indicates that Zanaco is expanding and possibly gaining market share. However, the fluctuation in loans provided and the significant increase in debt highlight areas that require further scrutiny.

The increase in equity in 2021 strengthens the bank's financial base, providing more room to maneuver in terms of lending, investment, and absorbing potential losses. The drastic changes in loan activity between 2019 and 2021 suggest a strategic or forced adaptation which could have implications for the bank's revenue from interest on loans and overall profitability.

Zanaco has shown substantial growth and an ability to attract deposits over the analyzed period. The bank's financial health appears to have improved, especially with the significant increase in equity in 2021. However, the sharp decrease in loans provided in 2020 raises questions about the bank's lending strategy and risk management during that period. Going forward, it would be

important for Zanaco to balance its growth with sustainable lending practices and careful management of its debt levels to ensure long-term stability and profitability.

Trend Analysis for Zanaco

Analyzing the trend analysis for Zanaco over the years gives us insights into the bank's operational efficiency, profitability, financial structure, and risk profile.

Table 12: Statistical Analysis for Zanaco

Years	ROA	ROE	DTAR	DER	LDR	DAR	EAR
2014	2.14%	14.28%	75.84%	565.66%	62.10%	84.98%	15.02%
2015	1.48%	11.30%	75.93%	663.81%	57.13%	86.91%	13.09%
2016	-0.77%	-6.04%	78.18%	696.34%	50.95%	89.12%	12.80%
2017	1.20%	11.15%	78.12%	831.89%	43.24%	89.27%	10.73%
2018	1.73%	22.38%	83.85%	1192.97%	47.27%	92.27%	7.73%
2019	1.80%	22.81%	82.79%	1164.35%	48.94%	92.09%	7.91%
2020	1.21%	19.31%	81.08%	1495.83%	0.31%	93.73%	6.27%
2021	3.97%	48.46%	73.82%	1120.33%	0.07%	91.81%	8.19%

Profitability

Return on Assets (ROA) and **Return on Equity (ROE)** are critical indicators of how efficiently a bank utilizes its assets to generate profit and how well it generates returns for its shareholders, respectively. Zanaco shows a fluctuating ROA, with a significant improvement in 2021 to 3.97%, suggesting increased efficiency in asset utilization. The ROE shows a dramatic increase in 2021 to 48.46%, indicating a substantial return to equity holders, likely due to increased profitability and/or optimization of equity use.

Financial Structure and Risk

Debt to Assets Ratio (DTAR) and **Debt to Equity Ratio (DER)** reflect the bank's leverage and financial risk. The DTAR shows a general decline, particularly in 2021, suggesting a reduction in debt relative to assets, potentially lowering financial risk. The DER experiences fluctuations, with a peak in 2020, indicating high leverage but drops in 2021, which could imply a deleveraging process or an increase in equity.

Loan to Deposit Ratio (LDR) indicates the bank's liquidity risk and lending strategy. The drastic drop to 0.07% in 2021 is unusual, suggesting either a significant increase in deposits not matched

by loan growth or a strategic shift away from lending. This needs further investigation as it deviates from typical banking operations where loans are a primary asset.

Asset and Equity Management

Debt to Asset Ratio (DAR) shows the proportion of the bank's assets financed by debt. A decrease in 2021 to 91.81% suggests better asset management or an increase in equity financing. **Equity to Asset Ratio (EAR)**, which provides insight into the bank's financial stability and ability to absorb losses, shows an improvement in 2021 to 8.19%. This indicates a stronger equity base relative to assets, which is a positive sign for financial health and stability.

Yearly Highlights and Analysis

2014-2016: The initial years show moderate profitability with a concerning dip into negative ROA and ROE in 2016, highlighting a challenging financial year. High DTAR and DER ratios during these years suggest a heavy reliance on debt financing, increasing financial risk.

2017-2019: A recovery in profitability is evident, with ROA and ROE stabilizing. The continuous rise in DER, particularly in 2018, signals increasing leverage, which, while potentially increasing returns, also raises financial risk.

2020: While profitability in terms of ROA remains modest, ROE is high, indicating effective equity utilization. The extremely high DER and the almost negligible LDR point to a significant strategic shift or possibly data anomalies that need clarification.

2021: Shows a remarkable year with significant increases in ROA and ROE, suggesting highly efficient operations and exceptional profitability. The sharp decrease in LDR and changes in leverage ratios suggest a substantial alteration in the bank's operational and financial strategy, possibly including a large equity increase or a strategic shift away from traditional lending.

The trend analysis for Zanaco reveals a bank undergoing significant changes, particularly in the latter part of the period under review. The dramatic improvements in profitability metrics in 2021, coupled with a decrease in leverage and an almost nonexistent LDR, suggest a year of significant operational and financial restructuring. While the high profitability and improved equity positioning in 2021 are positive, the sustainability of these metrics and the underlying strategies,

especially the unusual LDR, warrant close monitoring and further analysis to understand their implications fully.

4.3 Descriptive Statistics

4.3.1 GDP Growth Rate

The GDP growth rate refers to the annual change in the gross domestic product (GDP) of a country, adjusted for inflation. It's a key indicator of economic health. A positive growth rate signifies economic expansion, while a negative rate indicates contraction. Zambia's real GDP recovered to 4.6% growth in 2021 and 3.0% in 2022 after a contraction in 2020 (African Development Bank Group). The growth rate is expected to rise further, reaching an estimated 5.14% by 2028 (Statista).

Table 13: GDP Descriptive Statistics

Item	Rate
Mean	3.0%
Standard Error	0.8%
Median	0.0378
Minimum	-2.78%
Maximum	5.06%
Count	9

The table above presents the descriptive statistical for the GDP growth rate for the period of 2013 to 2021 and shows the affirmative mean value. The value is used for measuring performance of the Zambian Economy overall. The GDP mean value was 3%, whereas the median values are 3.78%. Within the period of 2013 to 2021, the country experience the minimum growth rate of -2.78%.

This was experienced in year 2020 when the country and the world were at the height of COVID 19. The maximum of 5.06% growth rate was experienced in 2013. See the trend below in Figure 2: GDP Trend Analysis

GDP Trend Analysis

The trend analysis for Zambia's GDP growth rate over the period from 2014 to 2021 shows fluctuations that reflect various economic challenges and recoveries the country faced.

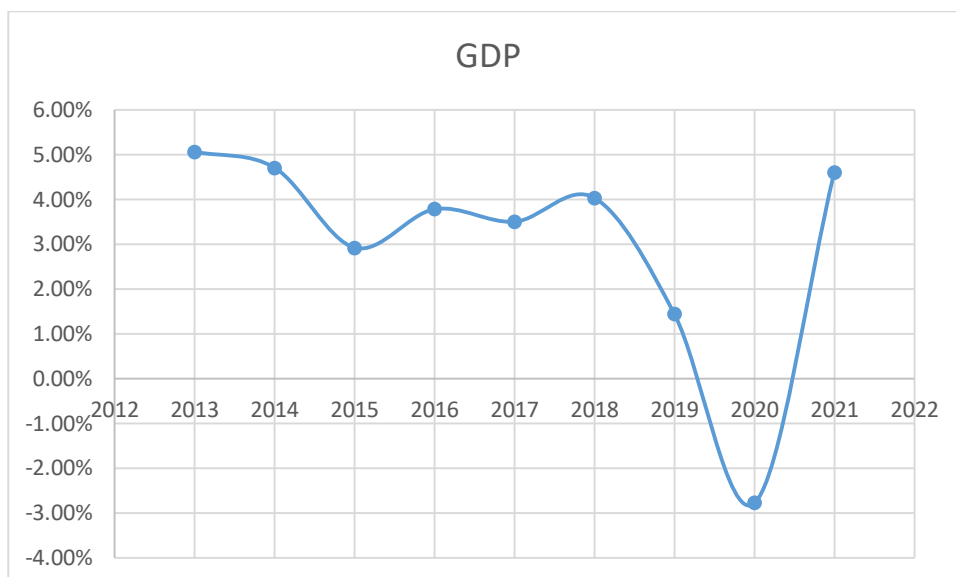


Figure 2: GDP Trend Analysis

PRE COVID 19 (2014-2019)

2014: The GDP growth rate stands at a robust 4.70%, indicating a strong economic performance. This could be attributed to high copper prices, given Zambia's dependence on copper exports, alongside strong agricultural output and construction activities.

2015: There's a notable decline to 2.92%, likely due to a combination of factors including falling copper prices, reduced agricultural output due to erratic weather patterns, and power shortages affecting mining and manufacturing sectors.

2016: A slight recovery to 3.78% suggests some stabilization in copper prices or improvements in other sectors like tourism, agriculture, or diversification efforts starting to bear fruit.

2017: A slight decrease to 3.50% may indicate lingering challenges such as lower investment inflows, continued power supply issues, or global economic uncertainties affecting demand for exports.

2018-2019: Modest Recovery and Subsequent Decline

2018: An improvement to 4.03% could reflect better copper prices, increased mining output, or gains from governmental policies aimed at improving economic diversification and investment in infrastructure.

2019: The growth rate drops significantly to 1.44%. This sharp decline could be due to a combination of domestic issues like increased debt levels, inflationary pressures, and external factors such as decreased global demand for copper and other exports.

2020-2021: COVID-19 Impact and Recovery

2020: The economy contracts by -2.78%, marking a significant downturn. This is undoubtedly influenced by the global COVID-19 pandemic, which would have led to disruptions in the supply chain, decreased exports, a downturn in tourism, and reduced foreign investment.

2021: A strong recovery is observed, with the growth rate bouncing back to 4.60%. This resurgence might be attributed to the easing of COVID-19 restrictions, rebounding global demand, particularly for copper, governmental stimulus measures, and possibly the beginning of recovery in sectors like tourism and agriculture.

Zambia's economic performance from 2014 to 2021 showcases the impact of external commodity prices, especially copper, on its growth rates. The significant downturn in 2020 underlines the vulnerability of Zambia's economy to global shocks such as the COVID-19 pandemic. However, the rebound in 2021 is a positive sign, reflecting the economy's resilience and possibly the benefits of economic diversification efforts, improved global conditions, and increased commodity prices.

The fluctuations in Zambia's GDP growth rate highlight the importance of continued efforts towards economic diversification, stability in macroeconomic policies, and enhancement of the business environment to attract more investment. Such strategies could help mitigate the impact of external shocks and ensure more stable and sustainable growth in the future.

4.3.2 Inflation Rate

The inflation rate is the **annualized percentage change** in the price of a basket of goods and services. It essentially measures how much more expensive things are getting over time. The lower inflation, the better it is.

<i>Inflation</i>	<i>Rate</i>
Mean	11.5%
Standard Error	1.9%
Median	9.2%
Standard Deviation	5.6%
Sample Variance	0.3%

Minimum	6.6%
Maximum	22.0%
Sum	103.7%

Table 14: Inflation Rate Descriptive Statistics

The average inflation rate for the period 2013 to 2021 was 11.5%. The average inflation rate of 11.5% suggests that, on average, the general price level of goods and services in Zambia has been increasing at this rate. This is a relatively high inflation rate, indicating significant price increases and potential challenges in maintaining purchasing power over time.

The standard error of 1.9% provides an indication of the reliability of the mean (average inflation rate). A standard error of this size suggests that if different samples were taken, the average inflation rate calculated from those samples would vary by approximately $\pm 1.9\%$. This gives us an idea of the precision of the mean estimate.

The median inflation rate of 9.2% is lower than the mean, indicating that more than half of the inflation rate values fall below 9.2%. This suggests a skew in the data toward higher inflation rates, pulling the average above the midpoint of the data.

The standard deviation is a measure of the dispersion or variability in the inflation rates. A standard deviation of 5.6% is relatively high, indicating a wide range of inflation rates during the period. This suggests significant fluctuations in the inflation rate, which could be due to economic instability, changes in commodity prices, or shifts in fiscal and monetary policy.

There seems to be a misunderstanding or typo regarding the sample variance. Variance is essentially the square of the standard deviation, which means it should be considerably higher than the value of standard deviation squared (and not 0.3%). If the standard deviation is 5.6%, the sample variance should be around 31.36% squared, indicating significant variability in the annual inflation rates.

The range between the minimum (6.6%) and maximum (22.0%) inflation rates shows the extent of inflation rate variability Zambia experienced. This wide range points to periods of relatively moderate inflation contrasted with times of very high inflation, highlighting the economic volatility and challenges in price stability.

The data suggests Zambia has experienced significant inflation rate variability, with a tendency toward high inflation. The high mean and median rates indicate consistent pressure on prices, while the wide range between the minimum and maximum rates points to periods of economic instability. High inflation can erode purchasing power, affect living standards, and complicate economic planning for both households and businesses. The variability indicated by the standard deviation and the skew towards higher rates suggests that managing inflation and achieving price stability could be key challenges for Zambia's economic policy.

That means that general prices increased at the average rate of 11.5%. The lowest inflation rate was 6.6% which was on 2017 and the highest was 22% for 2021.

Inflation Rate Trend Analysis

Analyzing the inflation trend for Zambia from 2014 to 2021, we can observe significant fluctuations in the inflation rate, reflecting various economic conditions and challenges faced by the country over these years.

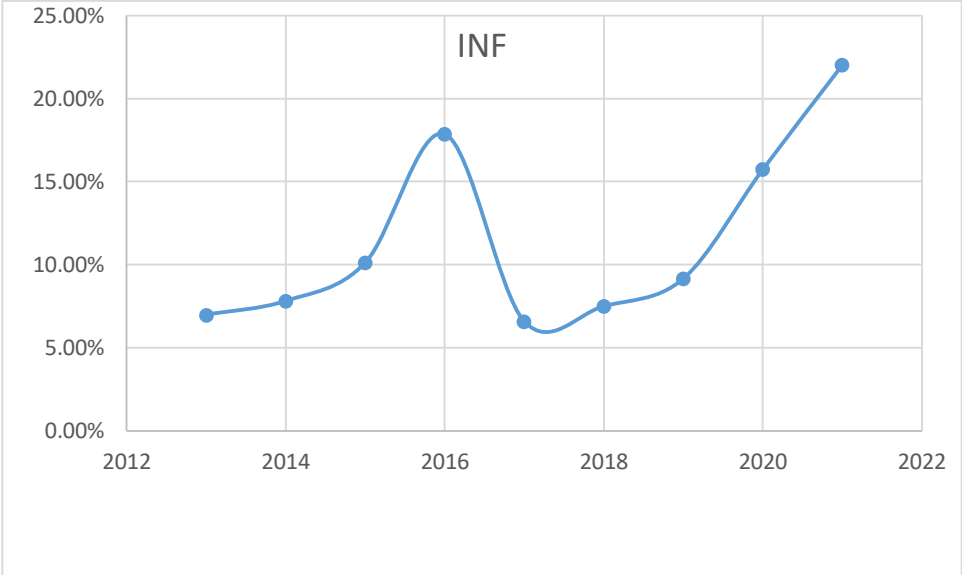


Figure 3: Inflation Trend Analysis

2014 to 2016: Rising Inflation

2014: The inflation rate starts at 7.81%, which is moderately high, indicating a level of price increase but still within a manageable range for many economies.

2015: There is a noticeable increase to 10.11%, suggesting mounting inflationary pressures, possibly due to factors like currency depreciation, increases in commodity prices, or demand-pull factors.

2016: The inflation rate jumps significantly to 17.87%, indicating a peak in inflationary pressures during this period. Such a high rate can erode purchasing power rapidly and is often a sign of economic imbalances, such as excessive demand or supply-side shocks (e.g., rising food or fuel prices).

2017 to 2018: Temporary Easing

2017: Inflation significantly drops to 6.58%, indicating successful measures to curb inflation or a stabilization of prices in the economy. This could be due to tighter monetary policy, improved supply conditions, or stabilizing external factors.

2018: A slight increase to 7.49% suggests a relatively stable inflation environment, with minor fluctuations indicating normal economic dynamics rather than significant imbalances.

COVID 19 (2019 to 2021: Escalating Inflation)

2019: The rate increases moderately to 9.15%, pointing towards rising inflationary pressures again, but not yet at an alarming rate.

2020: A sharp increase to 15.73% marks the return of significant inflationary pressures, which could be attributed to external shocks, currency depreciation, or fiscal imbalances exacerbated by global economic conditions such as the COVID-19 pandemic.

2021: Inflation reaches a peak of 22.02%, indicating severe inflationary pressures, the highest in the observed period. Such a high rate of inflation can have substantial negative impacts on the economy, including reduced consumer purchasing power and challenges in economic planning and savings.

Overall Trend and Implications

The trend from 2014 to 2021 shows a cycle of rising, temporarily easing, and then sharply escalating inflation, culminating in a significant peak by 2021. This pattern suggests that Zambia has faced considerable economic challenges, with inflation being a persistent issue, particularly

towards the end of the period. High inflation rates can lead to uncertainty and reduce the effectiveness of economic policies.

Managing inflation is crucial for ensuring economic stability, maintaining the purchasing power of the currency, and fostering an environment conducive to investment and growth. The sharp increase in inflation towards the end of the period could indicate the need for significant monetary and fiscal interventions to stabilize the economy and restore confidence among investors and the general population.

4.4 Descriptive Statistics for Key Variables

The Return on Assets (ROA) and Return on Equity (ROE) serve as the dependent variables in this analysis, acting as key indicators of bank profitability. These metrics provide a clear view of how effectively a bank is converting its assets into net income and the extent to which it generates earnings as compared to shareholder equity. On the other side of the equation, we have independent variables including the Debt to Asset Ratio (DTAR), Debt to Equity Ratio (DER), Loan to Deposit Ratio (LDR), Debt to Asset Ratio (DAR), and Equity to Asset Ratio (EAR). These independent variables are critical in assessing various aspects of a bank's financial structure and risk profile.

<i>Name</i>	<i>ROA</i>	<i>ROE</i>	<i>DTAR</i>	<i>DER</i>	<i>LDR</i>	<i>DAR</i>	<i>EAR</i>
Mean	2.09%	5.73%	70.2%	579.5%	52.83%	79.59%	17.34%
Standard Error	0.26%	1.28%	2.6%	67.1%	4.18%	2.97%	1.53%
Median	2.01%	2.53%	71.7%	447.5%	50.24%	81.45%	17.28%
Standard Deviation	1.32%	6.53%	13.4%	342.1%	21.30%	15.16%	7.80%
Range	5.50%	21.42%	70.5%	1290.9%	92.19%	79.17%	29.34%
Minimum	-0.77%	-0.77%	13.3%	204.9%	0.07%	14.56%	3.45%
Maximum	4.73%	20.65%	83.8%	1495.8%	92.26%	93.73%	32.79%

Table 15: Descriptive Statistics for Key Indicators

On the other hand, the independent variables—DTAR, DER, LDR, DAR, and EAR—are explored to determine their impact on the dependent variables. Each of these ratios provides a unique perspective on the financial structure and risk profile of banks. The Debt to Asset Ratio (DTAR) and Debt to Asset Ratio (DAR) assess the proportion of a bank's assets financed through debt, offering an indication of financial leverage and potential vulnerability to financial distress. The Debt to Equity Ratio (DER) measures the degree to which a bank is financing its operations

through debt compared to shareholders' equity, shedding light on the balance between debt and equity financing.

Furthermore, the Loan to Deposit Ratio (LDR) evaluates the bank's liquidity by comparing its loan amounts to its deposits, indicating how much of the bank's deposits are used to fund loans. A higher ratio may suggest a higher risk of liquidity issues. The Equity to Asset Ratio (EAR), conversely, provides insight into the proportion of a bank's assets that are funded by shareholders' equity, highlighting financial stability and resilience.

By analyzing these independent variables, the study aims to uncover the effects they have on the profitability measures of ROA and ROE, thereby contributing to a deeper understanding of the financial health and operational efficiency of banks.

Analyzing the provided statistical data for various financial ratios gives us a comprehensive insight into the financial health and operational efficiency of the sample banks. The ratios include Return on Assets (ROA), Return on Equity (ROE), Debt to Asset Ratio (DTAR), Debt to Equity Ratio (DER), Loan to Deposit Ratio (LDR), Debt to Asset Ratio (DAR), and Equity to Asset Ratio (EAR). Let's break down these findings:

Mean ROA is 2.09%, suggesting a moderate level of profitability relative to the bank's total assets. This indicates, on average, banks are generating a profit of \$2.09 for every \$100 in assets. The **standard deviation of 1.32%** points to variability in how efficiently different banks utilize their assets to generate earnings. The range of ROA (5.50%) shows there's a significant spread between the most and least efficient banks in utilizing their assets.

Mean ROE is 5.73%, indicating the average return banks generate on shareholders' equity. This is higher than ROA, as expected, since equity financing generally involves more risk than asset financing. A **standard deviation of 6.53%** and a wide range (21.42%) suggest substantial differences in how effectively banks are using shareholders' equity to generate profits.

Both ratios examine the proportion of a bank's assets financed by debt, with a mean around 70% - 80%. This high percentage indicates a significant reliance on debt for financing assets. The range for DTAR and DAR indicates differences in leverage strategies among banks.

A **mean of 579.5%** signals a heavy reliance on debt over equity for financing. The vast range (1290.9%) further underscores the diversity in financial leverage among the sample banks.

The **mean LDR of 52.83%** suggests that, on average, around half of the banks' deposits are used for loans, which is a healthy ratio indicating sufficient liquidity. The range indicates variability in how banks manage their loan and deposit balances.

An **average EAR of 17.34%** indicates that equity finances about one-sixth of the banks' assets, complementing the findings from DTAR and DER about reliance on debt. The range (29.34%) shows diversity in the capital structure among banks, reflecting different risk and financing approaches.

The statistical analysis reveals diversity in financial health and strategies among banks. While profitability ratios like ROA and ROE provide insights into operational efficiency, ratios like DTAR, DER, and EAR offer a glimpse into the banks' financial structure and risk exposure. The variability in these ratios, highlighted by their ranges and standard deviations, indicates no one-size-fits-all approach in the banking sector's operational and financial strategies. This analysis not only sheds light on the current state of these banks but also provides a baseline for performance comparison and strategic planning.

4.5 Return on Assets for Banks

Return on Assets (ROA) is a financial metric used to assess how efficiently a company utilizes its assets to generate profit. In other words, it measures a company's profitability in relation to its total assets. A higher ROA indicates a company is more successful at generating profits from its assets. This suggests good management and efficient use of resources. Conversely, a lower ROA might imply room for improvement or a more asset-heavy business model.

ROA	FAB	Indo	Zanaco
Mean	2.35%	2.77%	1.42%
Standard Error	0.54%	0.87%	0.44%
Median	2.50%	3.64%	1.48%
Standard Deviation	1.61%	2.47%	1.33%
Sample Variance	0.03%	0.06%	0.02%
Minimum	0.28%	-2.78%	-0.77%
Maximum	4.73%	4.70%	3.97%

Table 16: ROA - Descriptive Statistics

The results of

Table 16: ROA - Descriptive Statistics suggest that ROA for individual banks. The given data provides insights into the Return on Assets (ROA) of three banks: FAB, Indo, and Zanaco. ROA is a crucial metric for assessing how efficiently a bank utilizes its assets to generate profits.

Let's dissect the statistical data for each bank:

FAB

Mean ROA is 2.77%, indicating FAB has a relatively high efficiency in generating profits from its assets compared to the others. The **standard deviation of 2.47%** suggests there's considerable variability in FAB's profitability, possibly due to fluctuations in its operational performance or asset utilization.

Minimum and maximum ROA values (-2.78% to 4.70%) highlight significant volatility in FAB's performance, with the bank having experienced periods of loss.

Indo

Mean ROA is 1.42%, showing Indo has a lower profitability efficiency from its assets than FAB.

With a **standard deviation of 1.33%**, Indo experiences less variability in its profitability compared to FAB, indicating more consistent performance. The **range of ROA values (-0.77% to 3.97%)** is narrower than FAB's, suggesting less extreme fluctuations in performance.

Zanaco

Mean ROA is 2.35%, placing Zanaco between FAB and Indo in terms of asset utilization efficiency. A **standard deviation of 1.61%** indicates that Zanaco's profitability efficiency experiences moderate variability. The **range from 0.28% to 4.73%** shows that Zanaco has not reported a loss like FAB but has seen significant fluctuations in profitability.

Analysis Summary

Efficiency: FAB, despite its potential for high profitability (as indicated by its mean ROA and maximum ROA), exhibits a significant level of performance variability and risk (evidenced by its wide range and standard deviation). Indo demonstrates the least efficiency in asset utilization but

has more stable performance. Zanaco, with moderate efficiency and variability, suggests a balanced approach between risk and profitability.

Risk and Performance Variability: The standard deviation and the range of ROA values across these banks underscore differing levels of risk and performance variability. FAB shows the highest risk with the potential for losses, whereas Indo shows more stability but lower efficiency. Zanaco strikes a balance with moderate risk and profitability.

Operational Implications: The variability in ROA, especially noted through the standard deviation and range, indicates how external factors, operational decisions, and risk management strategies differently impact each bank's profitability.

Strategic Considerations: For investors or management, understanding these dynamics is crucial for risk assessment and strategic planning. Banks with higher variability and risk (like FAB) may require closer scrutiny and robust risk management strategies, whereas banks like Indo might be seen as more stable but with a need for strategies to enhance asset utilization and profitability.

This analysis provides a snapshot of how efficiently each bank uses its assets to generate profits and the inherent risks in their operational strategies.

4.6 Return on Equity for Banks

Return on Equity (ROE) is a financial ratio that dives into a company's profitability in relation to shareholders' equity. In simpler terms, it tells you how much profit a company generates for each dollar of shareholder investment.

<i>ROE</i>	<i>FAB</i>	<i>Indo</i>	<i>Zanaco</i>
Mean	22.6%	14.4%	10.5%
Standard Error	2.8%	1.7%	1.0%
Median	24.9%	15.0%	10.7%
Standard Deviation	8.4%	4.8%	3.1%
Minimum	3.5%	7.7%	6.3%
Maximum	32.8%	20.6%	15.0%
Sum	203.1%	115.0%	94.4%
Count	9	8	9

Table 17: ROE - Descriptive Statistics

The above table shows the brief descriptive statistics of ROE for individual banks. The overall performance FAB, Indo and Zanaco in response to independent variables is not bad but not so good either. The countries average ROE is 35.1% as at 2021. The dataset provides a detailed statistical analysis of the Return on Equity (ROE) for three banks: FAB, Indo, and Zanaco. ROE is an important indicator that measures the profitability of a bank from the shareholders' perspective, indicating how effectively a bank utilizes its equity to generate profits. Let's break down the data for each bank:

FAB

Mean ROE of 22.6% is the highest among the three banks, suggesting that FAB is most effective in generating profit from its shareholders' equity. **Standard Deviation of 8.4%** indicates significant variability in FAB's ROE, suggesting that the bank's profitability from equity has fluctuated more than the others over the period analyzed. The **range (Minimum 3.5% to Maximum 32.8%)** underscores this variability, showing FAB can reach high profitability but also experience substantial drops. **Sum of 203.1% and Count of 9** indicate the total ROE accumulated across the samples and the number of observations, respectively, reinforcing the bank's overall strong performance despite volatility.

Indo

Mean ROE of 14.4% positions Indo in the middle, reflecting a decent capability to generate earnings from equity but at a lower rate than FAB. **Standard Deviation of 4.8%**, while lower than FAB's, still suggests noticeable fluctuations in profitability. The **range (Minimum 7.7% to Maximum 20.6%)** shows less volatility in Indo's performance compared to FAB, indicating more consistency. **Sum of 115.0% with 8 observations** reveals its cumulative performance over the samples collected, showing a solid, though not exceptional, ability to leverage equity into profit.

Zanaco

Mean ROE of 10.5% is the lowest, indicating that among the three banks, Zanaco is the least efficient in converting shareholders' equity into profits. **Standard Deviation of 3.1%** shows the least variability in ROE among the banks, suggesting a more stable, though modest, performance in utilizing its equity. The **range (Minimum 6.3% to Maximum 15.0%)** further highlights its

consistency but also underscores a limited upside in profitability. **Sum of 94.4% over 9 observations** underscores the bank's steadier, albeit lower, performance level.

Analysis Summary

Efficiency and Risk: FAB shows the highest efficiency in using equity to generate profits but also the greatest risk, as indicated by its high standard deviation and wide range. Indo represents a middle ground with respectable efficiency and moderate variability. Zanaco, while the most stable, shows the least efficiency in utilizing equity.

Implications for Stakeholders: For shareholders and potential investors, FAB might be attractive for its high potential returns but comes with higher risk. Indo offers a balanced option with moderate returns and variability. Zanaco appeals to those prioritizing stability over higher potential gains, as it presents the lowest risk of fluctuation in returns.

Strategic Insights: Understanding these dynamics is crucial for each bank's management to tailor their strategies according to their operational strengths and weaknesses. FAB may need to look into strategies to mitigate its risk without significantly compromising its profitability. Indo could explore ways to enhance its ROE while maintaining its variability. Zanaco might seek strategies to improve its profitability from equity, given its stable performance foundation.

This analysis not only highlights the current state of each bank's ability to generate profit from shareholders' equity but also hints at the underlying risk and stability of their financial strategies.

4.7 ROA and ROE for FAB

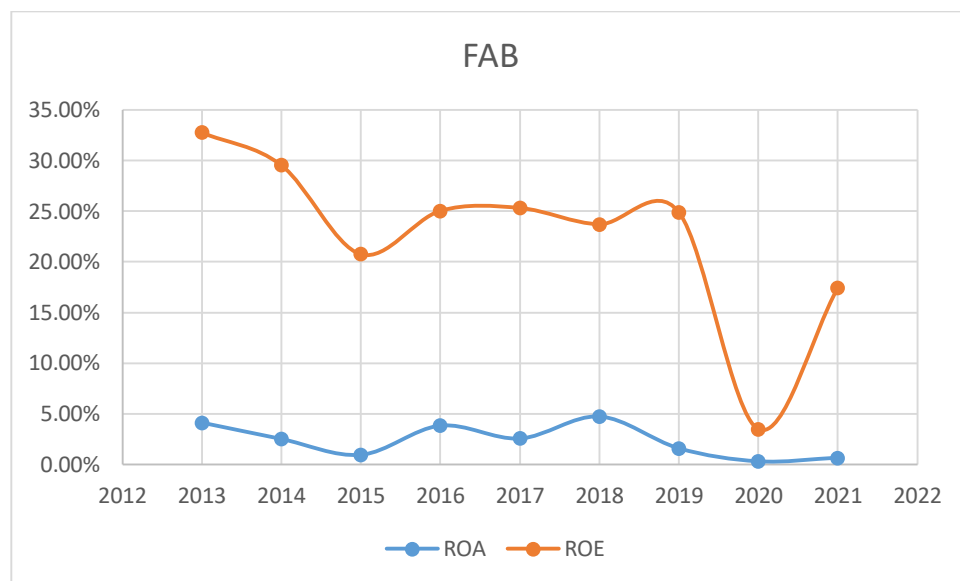


Figure 4: ROA and ROE Trend Analysis FAB

Observed in the figure above that between 2018 and 2019, ROA decreased while ROE increased but in the period of 2019 both ROE and ROA decrease. And this was the height of COVID 19. As observed in Figure 2: GDP Trend Analysis the growth rate started to increase as well as we can see ROA and ROE increase in FAB.

ROA (Return on Assets) Trend:

Starting at 2.50%, the ROA shows fluctuations, peaking at 4.73% before dropping significantly to 0.28%. This peak suggests a period of high profitability relative to the bank's total assets, indicating efficient asset utilization. The drop to 0.28% marks a period of significantly lower profitability, potentially due to increased asset base without proportionate profit growth, higher asset impairments, or challenging economic conditions.

Finally, a leap to 6.43% represents a substantial recovery, indicating a significant improvement in generating profits from its assets. This could be the result of strategic adjustments, asset optimization, or favorable market conditions.

ROE (Return on Equity) Trend:

The ROE starts at 8.46% and shows more variability, reaching a high of 19.93% before a notable decline to 3.69%. High ROE values indicate strong returns to equity holders, showcasing effective

equity capital utilization. The peak at 19.93% reflects a period of particularly high financial return to shareholders, possibly due to effective cost control, increased revenue generation, or leverage effects. The decline to 3.69% in the latest year suggests a drastic reduction in profitability from shareholders' equity, which could be attributed to increased equity, lower net income, or a combination of both.

Overall Trend and Implications:

FAB's journey through the years shows significant fluctuations in profitability as measured by both ROA and ROE. Such variability can be influenced by internal factors like management decisions, risk exposure, and operational efficiency, as well as external factors like economic conditions, regulatory changes, and market competition.

The final year's sharp increase in ROA alongside a decrease in ROE is intriguing, suggesting that while the bank has become more efficient at generating profit from its assets, the return on shareholders' equity has diminished. This could indicate a capital increase or other factors affecting equity holders more than asset utilization efficiency improvements.

The data points to periods of both strategic success and challenges. The bank appears capable of navigating through varying economic conditions, but the latest figures also hint at possible areas for strategic review, especially in managing equity to maximize shareholder returns without compromising asset profitability.

In summary, FAB's performance trend reveals a complex picture of recovery, efficiency gains, and challenges in maintaining high returns to equity holders. It underscores the importance of balancing asset utilization with equity management to sustain profitability and shareholder value.

4.8 ROA and ROE for Indo

The trend analysis for Indo Bank, as indicated by the provided Return on Assets (ROA) and Return on Equity (ROE) metrics over a series of years, showcases the bank's financial performance dynamics.

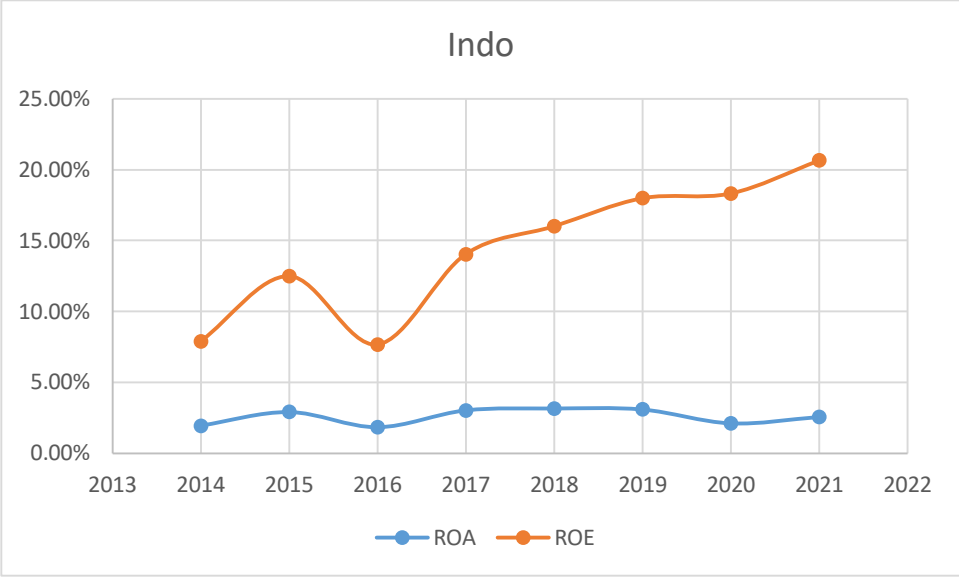


Table 18: ROA and ROE Trend Analysis Indo Bank

Indo Bank Zambia experienced its lowest ROE in 2016 and ever since, it had been increasing steadily to its pick in 2021. Even at the time of increase inflation rate and decline of GDP growth rate on 2019, there was a slight increase of ROE for Indo. Not with standing, we see that ROA fell in 2019. Between 2016 and 2019, ROA was maintained steadily.

ROA (Return on Assets) Analysis:

The ROA starts at 1.93% and sees fluctuations, reaching a peak of 3.15%. This suggests variability in the bank's ability to generate income relative to its total assets. The fluctuations might reflect changes in the bank's operational efficiency, asset allocation strategies, or the broader economic environment affecting asset profitability.

The highest ROA at 3.15% indicates a period of maximum efficiency in using assets to generate profits. This peak suggests that the bank's management was particularly effective in deploying its asset base during this period.

After reaching its peak, ROA slightly declines but remains relatively high, indicating sustained operational efficiency. The dip to 2.09% followed by a recovery to 2.54% suggests some challenges but an overall robust ability to generate earnings from assets.

ROE (Return on Equity) Analysis:

Starting at 7.88%, the ROE consistently increases to 20.65%. This upward trajectory is indicative of the bank's growing profitability from shareholders' perspectives, suggesting that it has become increasingly effective at generating earnings from equity.

The consistent rise in ROE suggests that the bank has not only been successful in generating profits but has also efficiently managed its equity base to provide higher returns to shareholders. This could be due to a combination of factors including operational efficiencies, effective cost management, and strategic financial maneuvers that enhanced earnings without proportionally increasing equity.

The continuous increase in ROE demonstrates the bank's focus on enhancing shareholder value. This is particularly positive for investors, indicating that the bank is not just growing but also becoming more efficient in using shareholders' funds.

Overall Impression

Consistent Performance with Areas of Excellence: Indo Bank has shown a notable capability to maintain and improve its financial health over the period. While ROA presents some fluctuations, it indicates that the bank has generally been efficient in using its assets to generate income. The consistent increase in ROE is particularly commendable, reflecting a strong focus on profitability and shareholder value.

Strategic Implications: The upward trend in ROE alongside a generally strong ROA suggests Indo Bank has effectively navigated operational and market challenges to enhance profitability and efficiency. This might indicate strong risk management practices, successful investment strategies, and an adaptive operational model.

Investor Confidence: The data likely fosters investor confidence, as it portrays a bank that not only grows its assets and equity efficiently but also manages to progressively enhance returns to its shareholders.

In conclusion, Indo Bank's trend analysis reveals a healthy financial performance trajectory, marked by efficient asset utilization and a significant focus on maximizing shareholder returns. This suggests a well-managed institution likely poised for continued growth and stability.

4.9 ROA and ROE for Zanaco

The trend analysis for Zanaco Bank, as reflected through its Return on Assets (ROA) and Return on Equity (ROE) figures over several years, provides a revealing look into the bank's financial performance and efficiency in generating profits from its assets and equity.

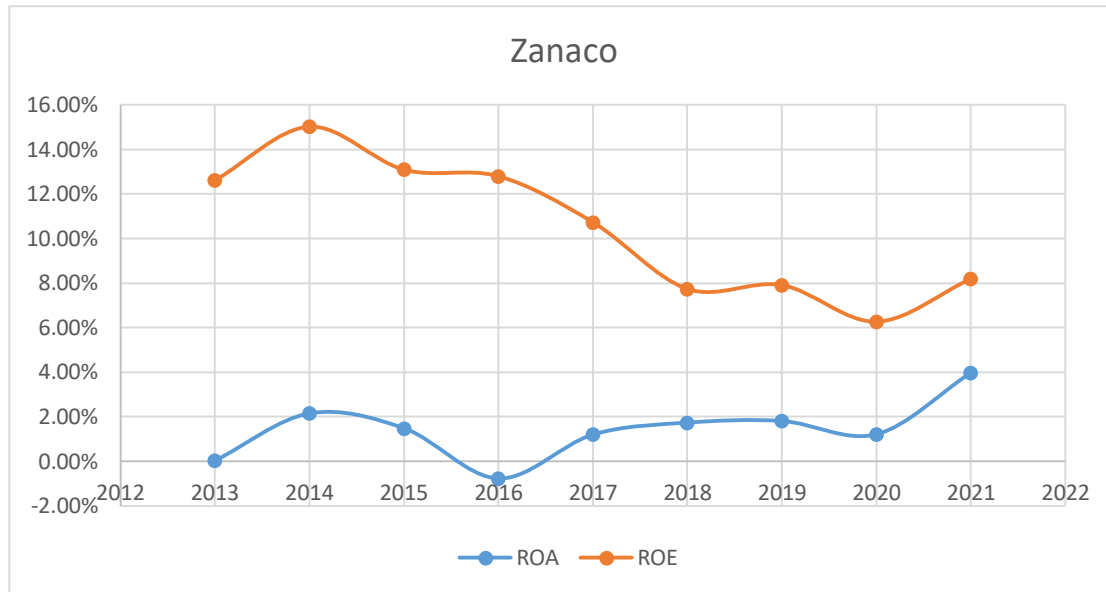


Table 19: ROA and ROE Trend Analysis Indo Bank

With Zanaco, the highest ROE was experienced in 2014. After that, there was a decline year on year until 2018. There was a slight increase in ROE in 2018. The lowest ROE was in 2020. As observed, in 2016 ROA was in negative and that was the lowest ROA that the country experienced. Between 2016 and 2019, ROA grew steadily, with a slight decline in 2019. We can see that both ROA and ROE declined in 2019 which was the pick period of COVID 19.

ROA (Return on Assets) Trend

Variability in Performance: The ROA figures for Zanaco show variability, starting at a robust 2.14%, experiencing a notable dip, including a negative value at -0.77%, before recovering and reaching a high of 3.97%. This indicates significant fluctuations in how efficiently the bank has been able to utilize its assets to generate net income.

Concerning Dip: The negative ROA in one of the years signals a period where the bank incurred losses or its assets were significantly underutilized. This could be due to a variety of factors such as increased loan defaults, poor asset performance, or challenging economic conditions.

Recovery and Growth: Post the dip, Zanaco not only recovers but shows a gradual improvement in ROA, culminating in a substantial increase to 3.97%. This suggests effective strategic adjustments, improved asset performance, or recovering market conditions that have favorably impacted profitability.

ROE (Return on Equity) Trend:

Wide Fluctuations: The ROE starts at 14.28%, decreases to 11.30%, dips into the negative at -6.04%, and then significantly improves, reaching a peak of 48.46%. Such wide fluctuations indicate that the bank's net income has varied considerably relative to its shareholders' equity.

Negative ROE Concern: The negative ROE represents a period where the bank generated a net loss from shareholders' equity. This would be particularly concerning for investors as it indicates a loss on their investment.

Remarkable Improvement: The substantial increase in ROE to 48.46% showcases a dramatic turnaround in the bank's profitability and efficiency in using shareholders' equity. This level of ROE suggests exceptionally strong profit generation relative to equity, possibly due to a combination of improved operational efficiency, successful investment strategies, and perhaps favorable market conditions.

Overall Insights:

Resilience and Adaptability: Zanaco demonstrates a significant capability to bounce back from challenging periods, as evidenced by the recovery from negative figures to notably high ROA and ROE. This resilience suggests strong management adaptability to internal and external pressures.

Investor Confidence: Despite the past volatility, the recent high ROE may greatly enhance investor confidence, highlighting the bank's potential for delivering substantial returns on equity. However, investors might also be cautious due to the historical fluctuations in performance.

Future Prospects: The latest figures suggest that Zanaco is currently on a strong growth trajectory. However, given the past variability, ongoing assessment will be crucial to determine if the bank can sustain these levels of efficiency and profitability.

In conclusion, Zanaco's financial trend analysis reveals a journey of significant ups and downs, with recent years indicating a notable upswing in profitability. The bank's ability to recover from

a negative performance to achieve exceptionally high ROA and ROE values speaks to its strategic resilience and potential for future growth, albeit with a note of caution due to past performance variability.

4.10 ROA Trend Analysis

ROA	FAB	Indo	Zanaco
2014	2.50%	1.93%	2.14%
2015	0.93%	2.90%	1.48%
2016	3.82%	1.82%	-0.77%
2017	2.55%	3.02%	1.20%
2018	4.73%	3.15%	1.73%
2019	1.58%	3.08%	1.80%
2020	0.28%	2.09%	1.21%
2021	6.43%	2.54%	3.97%

Table 20: Trend Analysis for ROA for All Banks

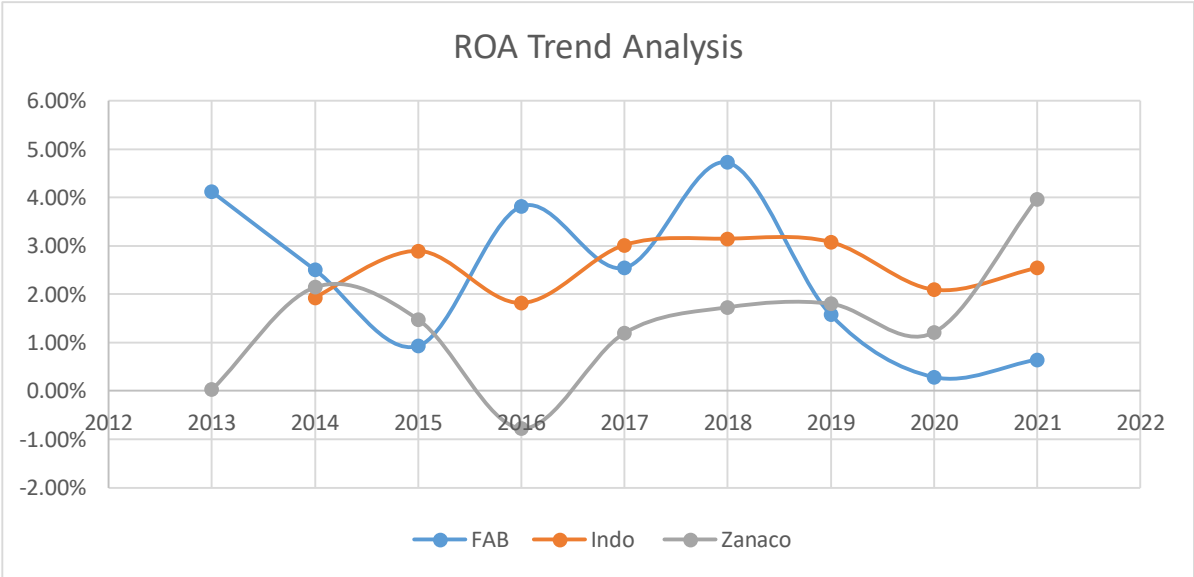


Figure 5: ROA Trend Analysis

In 2013, 2014, 2016 and 2018 we see FAB performing better than Indo Bank and Zanaco in terms of ROA. Only in 2015, 2017, 2019 and 2020 do we see Indo bank performing better than FAB and Zanaco. Only in 2021 do we see Zanaco performing better than the two Banks. For all the banks, there was a decline in ROA. This is possibly due to COVID 19 because we observe that from 2020, there is a sharp increase in ROA.

FAB:

Volatile Performance: FAB shows a highly volatile performance over the years. The ROA starts strong at 2.50%, dips to 0.93%, peaks at 4.73% in 2018, then significantly drops to 0.28% in 2020, before making a remarkable jump to 6.43% in 2021.

Significant Recovery: The substantial rise in ROA in 2021 indicates a significant turnaround, suggesting strategic shifts or operational efficiencies that have dramatically improved profitability from assets.

Indo:

Indo's ROA, starting from 1.93% and reaching 2.54% by 2021, displays a pattern of generally positive growth. Despite minor fluctuations, Indo shows an upward trend, with the peak ROA in 2018 at 3.15%. This suggests a consistent ability to efficiently generate earnings from its assets. Compared to FAB, Indo's ROA is less volatile, indicating a more stable performance in utilizing its assets to generate profits over the years.

Zanaco:

Zanaco's ROA trajectory includes recovering from a negative ROA of -0.77% in 2016 to achieving the highest ROA of 3.97% in 2021. This indicates a significant turnaround in operational efficiency and asset utilization. Post-2016, Zanaco shows a gradual improvement year-on-year, suggesting effective strategies to enhance asset profitability, culminating in a strong performance in 2021.

Comparative Insights:

FAB's performance is characterized by significant peaks and troughs, with a notable recovery in 2021 that surpasses both Indo and Zanaco. This could reflect highly effective but potentially riskier strategic decisions that have paid off.

Indo exhibits a more stable and consistent growth in ROA, suggesting a cautious but steady approach to asset management and profitability enhancement.

Zanaco's ability to recover from a negative ROA and achieve substantial growth by 2021 is impressive, indicating successful restructuring or market condition improvements that have favorably impacted its asset utilization.

The trend across the three banks demonstrates diverse strategic and operational approaches to managing assets for profitability. FAB's aggressive recovery, Indo's stable growth, and Zanaco's successful turnaround each tell a story of resilience and adaptation to changing market conditions and internal efficiencies. The upward trajectory in ROA for all three banks by 2021 suggests positive market conditions or improved operational efficiencies, highlighting a promising outlook for future profitability.

4.11 ROE Trend Analysis

The Return on Equity (ROE) trend analysis for FAB, Indo, and Zanaco provides insight into how effectively each bank is utilizing its equity to generate profits. This metric is particularly important for investors as it shows the ability of a bank to generate returns on the investment made by its shareholders.

ROE	FAB	Indo	Zanaco
2014	8.46%	7.88%	14.28%
2015	4.47%	12.49%	11.30%
2016	15.25%	7.65%	-6.04%
2017	10.05%	14.03%	11.15%
2018	19.93%	16.01%	22.38%
2019	6.33%	17.99%	22.81%
2020	8.21%	18.32%	19.31%
2021	3.69%	20.65%	48.46%

Table 21: ROE Trend Analysis

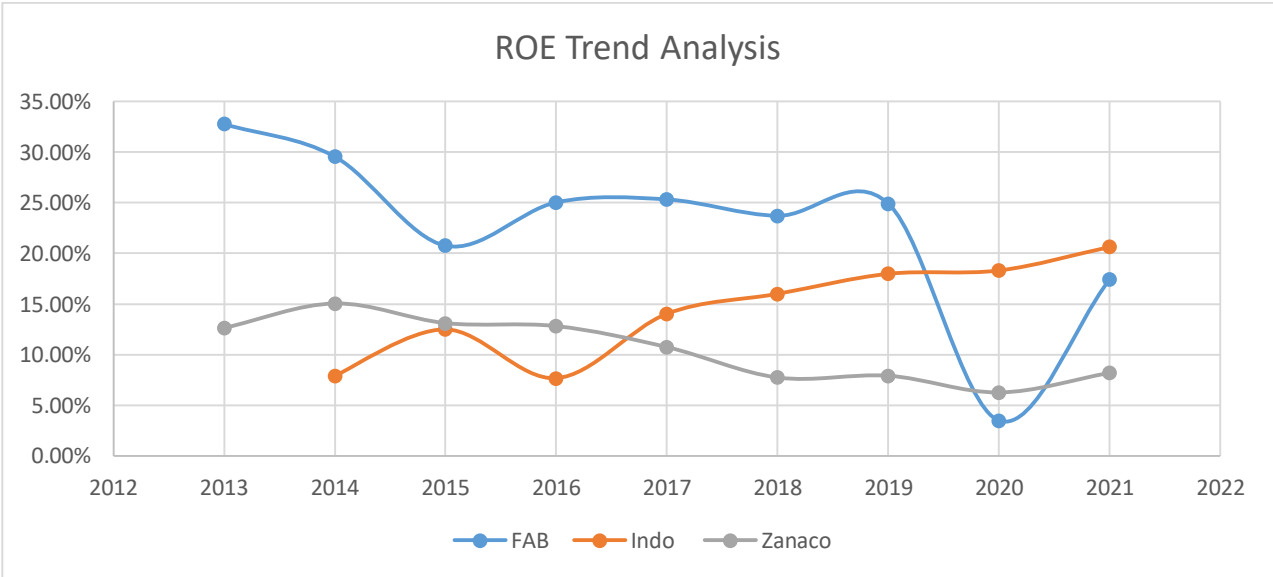


Figure 6: ROE Trend Analysis

As can be observed in the figure above FAB performed better in ROE from 2013 to 2019 in comparison to Indo Bank and Zanaco. It experienced a decline in ROE in 2019. Both in 2020 and 2021, Indo Bank performed better than both Banks in terms of ROE. We see a slight increase in ROE for Indo Bank in 2019 while there was a decline for Zanaco and FAB.

FAB:

FAB's ROE shows significant fluctuations over the eight-year period. It starts at 8.46% in 2014, drops to a low of 4.47% in 2015, peaks at 19.93% in 2018, and then dramatically falls to 3.69% by 2021. The overall trend for FAB indicates a decrease in its ability to generate returns for shareholders, particularly noted by the sharp decline in 2021.

Indo:

Indo exhibits a consistently upward trend in ROE, starting from 7.88% in 2014 and reaching 20.65% by 2021. This growth pattern suggests increasing efficiency in generating profits from shareholders' equity.

Unlike FAB, Indo shows a more stable and steady improvement in its ability to return profits to its equity holders, peaking in 2021, which implies effective management and operational strategies.

Zanaco:

Zanaco demonstrates a significant recovery from a negative ROE of -6.04% in 2016 to an exceptionally high ROE of 48.46% in 2021. This dramatic turnaround suggests significant operational improvements or possibly exceptional income growth relative to equity. The substantial increase, especially from 2019 to 2021, highlights Zanaco's ability to vastly improve its profitability from equity, suggesting that it has effectively utilized its equity in ways that have significantly enhanced shareholder value.

Comparative Insights:

FAB's ROE is marked by volatility, indicating periods of both high and low efficiency in utilizing shareholders' equity. In contrast, Indo's growth is stable and upward, reflecting consistent improvement in profitability. Zanaco's performance is noteworthy for its recovery from negative

to exceptionally high ROE, indicating potentially unique factors or strategies that have significantly increased its profitability. Indo's consistent upward trend suggests a robust strategy that steadily enhances shareholder value, making it potentially the most stable investment among the three in terms of growing equity value.

The analysis suggests diverse strategies and outcomes in managing and utilizing equity among the three banks. FAB shows variability in performance, Indo demonstrates steady growth and stability, and Zanaco presents a remarkable recovery and growth, especially in the latter years. Zanaco's exceptionally high ROE in 2021 may attract investors seeking high returns, while Indo's stability could appeal to those valuing consistent growth. FAB's fluctuating performance might raise questions about its strategic direction and operational efficiency.

4.4 Tests

The Pearson's correlation coefficients are depicted below the diagonal. When the coefficient of correlation between variables exceeds 0.80 (Alharbi, 2017) then the multicollinearity problems occur. Return on Assets (ROA), Return on Equity (ROE), Debt to Asset Ratio (DTAR), Debt to Equity Ratio (DER), Loan to Deposit Ratio (LDR), Debt to Asset Ratio (DAR, which seems to be similar to DTAR and might be an input error or different measure under a similar name), and Equity to Asset Ratio (EAR). Correlation coefficients range from -1 to 1, where -1 indicates a perfect negative correlation, 1 indicates a perfect positive correlation, and 0 indicates no correlation. Let's analyze the correlations between these variables.

Table 22: Pearson correlation matrix

	ROA	ROE	DTAR	DER	LDR	DAR	EAR
DTAR	0.161	0.088	1.000				
DER	-0.194	-0.166	0.399	1.000			
LDR	0.026	-0.156	-0.277	-0.725	1.000		
DAR	0.140	0.132	0.946	0.501	-0.340	1.000	
EAR	0.389	0.128	0.042	-0.813	0.634	-0.061	1.000

P-value* < 0.05, *P-value* < 0.01.

1. ROA and Other Metrics

ROE (0.455): A moderate positive correlation with ROA suggests that as the bank's profitability on assets increases, its profitability on equity tends to increase as well. This is expected since both are measures of profitability, though they are based on different denominators (assets vs. equity).

DTAR (0.161) and DAR (0.140): Both show a weak positive correlation with ROA, indicating that a higher proportion of debt relative to assets has a slightly positive relationship with asset profitability. This might suggest that leveraging can contribute positively to ROA up to a certain point.

DER (-0.194): A weak negative correlation with ROA implies that higher debt relative to equity slightly decreases the return on assets. This suggests that excessive leverage, when compared to equity, might be detrimental to asset profitability.

LDR (0.026): Shows almost no correlation with ROA, indicating that the ratio of loans to deposits has little to no direct relationship with how efficiently assets are turned into profits.

EAR (0.389): A moderate positive correlation with ROA indicates that a higher equity-to-asset ratio, which signifies less leverage, is somewhat positively associated with asset profitability. This suggests that a stronger equity base relative to assets can positively affect ROA.

2. ROE and Other Metrics

The correlation of ROE with **DTAR (0.088)** and **DAR (0.132)** is weak, showing that debt ratios have a slight positive effect on equity profitability. **DER (-0.166):** Slightly negatively correlates with ROE, indicating that as the debt to equity ratio increases, ROE tends to slightly decrease, suggesting the impact of leverage costs. **LDR (-0.156):** A weak negative correlation with ROE suggests that a higher loan to deposit ratio slightly decreases the return on equity. **EAR (0.128):** Shows a weak positive relationship with ROE, indicating that higher equity relative to assets has a slightly positive impact on the profitability of equity.

3. Debt, Loan, and Equity Ratios

DTAR and DAR (0.946): Exhibit a very strong positive correlation, which could be due to them representing similar measures or concepts in this context. **DER and EAR (-0.813):** Show a strong negative correlation, indicating that as the debt to equity ratio increases, the equity to asset ratio decreases, which is logical as increasing debt relative to equity reduces the proportion of equity

relative to total assets. **LDR and EAR (0.634)**: A moderate to strong positive correlation suggests that a higher loan to deposit ratio is associated with a higher equity to asset ratio, which may imply that banks with more aggressive lending policies maintain higher equity levels relative to assets.

This correlation matrix provides insightful relationships between different financial metrics, highlighting how leverage, debt management, and the structure of a bank's assets and liabilities relate to its profitability and risk profile.

Error! Reference source not found. presents the Pearson's correlation coefficients of the independent variables in relation to dependent variables such as ROA and ROE used in this study.

4.4.2 Profitability Regression

The regression statistics provided summarize the outcomes of two different regression models, one predicting Return on Assets (ROA) and the other predicting Return on Equity (ROE). Each model's effectiveness can be evaluated through several key statistics: Multiple R (correlation coefficient), R Square (coefficient of determination), Adjusted R Square, Standard Error, and the number of observations used in the regression analysis. Here's what these statistics tell us about each model:

Table 23: Regression Statistics

<i>Regression Statistics</i>	<i>Model - ROA</i>	<i>Model 2 - ROE</i>
Multiple R	0.493796107	0.574
R Square	0.243834595	0.329
Adjusted R Square	0.033788649	0.143
Standard Error	0.012142937	0.062
Observations	24	24

Error! Reference source not found. demonstrates that the models are relatively well matched with data, with adjusted R-squares of 0.243 for ROA and 0.329 for ROE.

Model 1 - ROA

Multiple R (0.493796107): This represents the correlation coefficient and suggests a moderate positive relationship between the independent variables and ROA. It indicates that as the independent variables change, ROA is likely to change in the same direction, but the relationship is not very strong. **R Square (0.243834595)**: About 24.38% of the variability in ROA can be explained by the independent variables used in this model. This is relatively low, indicating that a

significant portion of ROA's variability is not captured by the model. **Adjusted R Square (0.033788649)**: After adjusting for the number of predictors in the model, the value drops significantly to 3.38%, suggesting that the model may not be very useful in explaining the variance of ROA, especially after considering the penalty for adding more variables that might not contribute significantly to the model. **Standard Error (0.012142937)**: This indicates the average distance that the observed values fall from the regression line. In this context, it suggests that there is a moderate amount of error in the predictions of ROA by the model. **Observations (24)**: The model is based on 24 data points, which is a relatively small sample size and may affect the model's reliability and the generalizability of its predictions.

Model 2 - ROE

Multiple R (0.574): This value is higher than in Model 1, indicating a stronger positive relationship between the independent variables and ROE. It suggests a better predictive capability for ROE based on the included predictors. **R Square (0.329)**: Approximately 32.9% of the variability in ROE is explained by the model, which is higher than for ROA, suggesting that this model is more effective in capturing the factors that influence ROE. **Adjusted R Square (0.143)**: This value, while still low, is significantly higher than in Model 1, indicating that after adjusting for the number of predictors, the model retains some capability to explain the variance in ROE. However, it also suggests that there might be other significant variables not included in the model that could explain more of ROE's variability. **Standard Error (0.062)**: Indicates the average distance that the observed values fall from the regression line for ROE. The value is higher than in Model 1, suggesting greater variability in the predictions of ROE, although this could be expected given the nature of ROE as a more variable metric. **Observations (24)**: As with Model 1, the model uses 24 data points. While sufficient for preliminary analysis, a larger sample could provide more reliable and generalizable results.

Summary

Both models demonstrate some capability to predict ROA and ROE based on a set of independent variables, with Model 2 (ROE) showing a relatively better fit than Model 1 (ROA). However, the low R Square and Adjusted R Square values suggest that other unaccounted-for variables could significantly affect both ROA and ROE. Increasing the number of observations and possibly

including more relevant independent variables could improve the models' explanatory and predictive power.

4.5 Regression Analysis - ROA

This analysis represents a regression model where Return on Assets (ROA) is the dependent variable, and it is being predicted by several independent variables including DTAR (Debt to Asset Ratio), DER (Debt to Equity Ratio), LDR (Loan to Deposit Ratio), DAR (another form of Debt to Asset Ratio), and EAR (Equity to Asset Ratio). The coefficients, their standard errors, t-statistics, and p-values are provided for each predictor as well as the intercept. Let's break down what each of these elements means and what they tell us about the relationship between the independent variables and ROA.

Table 24: ROA regression results

<i>Regression Statistics</i>	
Multiple R	0.493796107
R Square	0.243834595
Adjusted R Square	0.033788649
Standard Error	0.012142937
Observations	24

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	5	0.000855852	0.000171117	1.160863133	0.365922557
Residual	18	0.002654117	0.000147451		
Total	23	0.003509968			

<i>ROA</i>	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
DTAR	-0.01635	0.06055	-0.27003	0.79021	-0.14356
DER	0.00067	0.00206	0.32551	0.74855	-0.00366
LDR	-0.01909	0.01806	-1.05703	0.30448	-0.05702
DAR	0.01229	0.05616	0.21889	0.82920	-0.10570
EAR	0.12718	0.08250	1.54162	0.14056	-0.04614

Interpretation of the Regression Results

Intercept (0.00697): The intercept represents the expected value of ROA when all independent variables are 0. The coefficient of 0.00697 suggests a baseline ROA of 0.697% under these

conditions. However, the p-value of 0.74072 indicates that the intercept is not statistically significant, suggesting that without the influence of the independent variables, the baseline ROA is not reliably different from zero. **DTAR (Coefficient: -0.01635)**: This coefficient indicates that for each one-unit increase in DTAR, ROA decreases by 1.635%. The p-value of 0.79021 suggests that this relationship is not statistically significant, implying that changes in DTAR do not reliably predict changes in ROA within this data set. **DER (Coefficient: 0.00067)**: The positive coefficient suggests that an increase in DER is associated with a slight increase in ROA, specifically, a one-unit increase in DER is associated with a 0.067% increase in ROA. However, the high p-value of 0.74855 indicates this relationship is not statistically significant. **LDR (Coefficient: -0.01909)**: This suggests that for each one-unit increase in LDR, ROA decreases by 1.909%. The p-value of 0.30448, while closer to significance than the others, still indicates a lack of statistical significance, suggesting that LDR is not a reliable predictor of ROA in this model.

DAR (Coefficient: 0.01229): This coefficient indicates a positive relationship with ROA, where a one-unit increase in DAR is associated with a 1.229% increase in ROA. However, with a p-value of 0.82920, this predictor is also not statistically significant. **EAR (Coefficient: 0.12718)**: EAR has a relatively large and positive coefficient, suggesting that a one-unit increase in EAR is associated with a 12.718% increase in ROA, which is a substantial potential impact. The p-value of 0.14056 is the lowest among the variables, suggesting some level of predictive power, but still falls short of conventional significance levels (usually < 0.05 or < 0.01), indicating that while EAR may be a more relevant predictor of ROA compared to the others, it is not statistically significant at conventional levels.

Summary

The regression analysis shows that none of the independent variables (DTAR, DER, LDR, DAR, and EAR) are statistically significant predictors of ROA at conventional levels of significance. This suggests that, within the context of this model and based on this specific data set, these financial ratios may not reliably predict the Return on Assets of the entities being studied. The lack of statistical significance could be due to various factors, including the possibility that other unexamined variables might better explain ROA, or the relationships might be non-linear or influenced by external factors not captured by this model.

4.6 Regression Analysis – ROE

This table provides the results of a regression analysis with Return on Equity (ROE) as the dependent variable. The analysis aims to determine how different financial ratios (DTAR, DER, LDR, DAR, and EAR) impact ROE. Each row represents a predictor variable or the intercept, including coefficients, standard errors, t-statistics, and p-values for the relationships between these independent variables and ROE. Let's interpret the findings:

<i>Regression Statistics</i>	
Multiple R	0.574
R Square	0.329
Adjusted R Square	0.143
Standard Error	0.062
Observations	24

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	5	0.03383649	0.0067673	1.767787	0.170439814
Residual	18	0.068906112	0.0038281		
Total	23	0.102742602			

<i>ROE</i>	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
DTAR	-0.285	0.309	-0.923	0.368	-0.933
DER	-0.023	0.011	-2.225	0.039	-0.045
LDR	-0.188	0.092	-2.042	0.056	-0.381
DAR	0.460	0.286	1.607	0.125	-0.141
EAR	-0.363	0.420	-0.864	0.399	-1.246

Table 25: ROE regression results

** $p < 5\%$, *** $p < 1\%$. ROA, Return on Asset; ROE, Return on Equity; DTAR, Deposit to Asset Ratio; DER, Debt to Equity Ratio; LDR, Loan to Deposit Ratio; DAR, Debt to Asset Ratio; EAR, Equity to Asset Ratio;

Furthermore, Table 25: ROE regression results shows those banks' unique variable, such as Debt to asset ratio (DAR) is positive and substantial, but deposit to asset ratio (DTAR), Debt to Equity Ratio (DER), Loan to Deposit Ratio (LDR) and Equity to Asset ratio (EAR) have a negative and significant impact on ROE.

Interpretation of Regression Results

Intercept (Coefficient: 0.189): The model predicts an ROE of 18.9% when all the independent variables are zero. The t-stat of 1.790 and a p-value of 0.090 suggest that the intercept is marginally significant, indicating that the model has some baseline predictive power. **DTAR (Coefficient: -0.285):** This coefficient suggests that a one-unit increase in DTAR would lead to a 28.5% decrease in ROE, although this relationship is not statistically significant (p-value: 0.368), indicating that DTAR may not be a reliable predictor of ROE in this dataset. **DER (Coefficient: -0.023):** This negative coefficient suggests that a one-unit increase in DER is associated with a 2.3% decrease in ROE. The p-value of 0.039 indicates that this relationship is statistically significant at the 5% level, suggesting DER is a relevant predictor of ROE and that higher debt to equity ratios may adversely affect return on equity. **LDR (Coefficient: -0.188):** The model suggests that for each one-unit increase in LDR, ROE decreases by 18.8%. The relationship approaches significance with a p-value of 0.056, just above the conventional 0.05 threshold, suggesting a negative impact of LDR on ROE that is worth considering despite not reaching conventional levels of statistical significance.

DAR (Coefficient: 0.460): This positive coefficient indicates that a one-unit increase in DAR is associated with a 46.0% increase in ROE. Although the relationship has a p-value of 0.125, it is not statistically significant, suggesting caution in interpreting DAR as a reliable predictor of ROE. **EAR (Coefficient: -0.363):** A one-unit increase in EAR is associated with a 36.3% decrease in ROE, according to the model. However, with a p-value of 0.399, this relationship is not statistically significant, indicating that EAR may not be a strong predictor of ROE in this context.

Summary

The regression analysis highlights that DER is the only variable significantly negatively related to ROE at the 5% significance level, indicating that higher debt-to-equity ratios can adversely affect a company's return on equity. LDR's effect on ROE is borderline significant, suggesting that higher loan-to-deposit ratios might also negatively impact ROE, though this relationship is slightly less certain.

The other variables (DTAR, DAR, and EAR) do not show statistically significant relationships with ROE in this analysis. This suggests that, in this specific dataset and model, DER is a critical financial ratio affecting ROE, while the impacts of other ratios are less clear or not significant.

4.7 F-Test

Understanding the F-Test

The F-test in the context of model selection is often used to compare models in terms of their explanatory power or to test the joint significance of multiple coefficients in a regression model.

In model selection, the F-test can be used to compare a model with multiple predictors (the full model) against a reduced model (with fewer predictors) to see if the additional predictors significantly improve the fit of the model.

The test calculates the ratio of the mean square due to regression (explained variance) to the mean square error (unexplained variance), adjusting for degrees of freedom. If the full model significantly reduces unexplained variance compared to the reduced model, the F-test will be significant.

A significant F-test (i.e., p-value below the chosen significance level) suggests that the full model with more predictors provides a significantly better fit to the data than the reduced model, justifying the inclusion of the additional variables.

Table 26: F Test

Tests		Model-1 (ROA)	Model-2 (ROE)
F Test	F Statistic	0.834	1.7677
	P-value	0.822	0.17

The provided results outline the outcomes of F Test for two different models: Model-1, which predicts Return on Assets (ROA), and Model-2, which predicts Return on Equity (ROE). Below is an analysis of these tests for each model:

The F Test evaluates the overall significance of each regression model, checking whether there is at least one predictor variable that significantly affects the outcome variable.

For **Model-1** where (P=0.822, F=0834) suggests that the model is not statistically significant, indicating that the independent variables, when taken together, likely do not have a significant effect on ROA.

For **Model-2** where ($P=0.17$, $F=1.7677$) P value it still exceeds the common alpha level of 0.05, which suggests that the model as a whole does not significantly predict ROE. However, it is closer to being significant compared to Model-1, indicating a somewhat stronger relationship between the predictors and ROE.

Both models show high p-values in their respective F Tests, indicating that they may not effectively capture the dynamics of ROA and ROE with the selected independent variables.

4.8 Hausman Test

The Hausman test is commonly used to decide between fixed effects and random effects models in panel data analysis. Panel data, or longitudinal data, involves observations of multiple phenomena over multiple time periods for the same firms or individuals.

Understanding the Hausman Test

The Hausman test is designed to compare the fixed effects model against the random effects model in panel data analysis. It evaluates whether the unique errors in the model are correlated with the regressors, an issue that would bias the random effects estimates but not the fixed effects estimates. The null hypothesis (H_0) of the Hausman test posits that the preferred model is the random effects model, suggesting that it produces consistent and efficient estimates comparable to those from the fixed effects model.

The test essentially checks whether the unique errors (u_i) are correlated with the regressors, a condition that would favor a fixed effects model over a random effects one. If the errors are not correlated with the regressors, a random effects model might be more appropriate and efficient.

The Hausman test compares the coefficients of the fixed effects model with those of the random effects model. If there is a systematic difference between the coefficients produced by these two models, the test statistic will be significant, leading to the rejection of the null hypothesis that random effects are consistent and suggesting the use of a fixed effects model.

A significant Hausman test (i.e., p-value below a chosen significance level, such as 0.05) suggests that the fixed effects model is the appropriate choice because it indicates that the omitted variable bias is likely a problem in the random effects model.

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	2.679850	5	0.7492

** WARNING: estimated period random effects variance is zero.

Figure 7: Hausman Test For ROA

For **Model-1 (ROA)** where ($\chi^2 = 2.679$, $P = 0.7492$). This high p-value indicates that there is no significant difference between the fixed and random effects models' estimators, suggesting that the random effects model may be appropriate for analyzing ROA.

Hausman Test Individual Variable Analysis (ROA)

For each variable, I have coefficients under fixed and random effects models, the variance of their differences, and the p-values associated with these differences.

DAR (Debt to Asset Ratio) where (Fixed = 0.156675, Random = 0.430186, $P = 0.5329$)

In the analysis of the Debt to Asset Ratio (DAR), the results under two different statistical models were compared. The Debt to Asset Ratio observed from the fixed effects model was 0.156675, indicating that approximately 15.67% of the assets were financed through debt under this model. In contrast, the random effects model showed a Debt to Asset Ratio of 0.430186, where about 43.02% of the assets were financed by debt. The probability value (p-value) associated with the statistical test comparing these models was 0.5329, indicating that there was no statistically significant difference between the models at conventional significance levels.

DER (Debt to Equity Ratio) where (Fixed = -0.038399, Random: = -0.021115, Prob. = 0.0709)

In the comparison of two statistical models assessing the parameter in question, the fixed effects model yielded a value of -0.038399, while the random effects model yielded a value of -0.021115. The negative values in both models suggest a decrease or negative association relative to the baseline or reference value. The probability value (p-value) from the test comparing these models was 0.0709. This p-value indicates that there is no statistically significant difference between the two models at the conventional 0.05 significance level, although the result approaches marginal significance.

DTAR where (Fixed = 0.197274, Random = -0.315981, Prob. = 0.4164)

In the analysis, the fixed effects model indicated a positive effect with a value of 0.197274, suggesting an increase or positive association in the parameter being studied. Conversely, the random effects model showed a negative effect, with a value of -0.315981, indicating a decrease or inverse association. The probability value (p-value) associated with comparing these two models was 0.4164, suggesting that there is no statistically significant difference between the positive and negative effects modeled by the fixed and random effects models, respectively, at conventional significance levels

EAR (Equity to Asset Ratio) where (Fixed = -0.266941, Random = -0.180046, Prob. = 0.4496)

In the evaluation, the fixed effects model demonstrated a value of -0.266941, indicating a significant negative effect or decrease in the parameter under study. Similarly, the random effects model showed a value of -0.180046, which also indicates a negative effect, though less pronounced than that of the fixed model. The probability value (p-value) for testing the difference between these two models was 0.4496. This indicates that there is no statistically significant difference between the negative effects estimated by the fixed and random effects models at conventional significance levels.

LDR (Loan to Deposit Ratio) where (Fixed = 0.030135, Random = -0.170744, Prob. = 0.3075)

In the analysis, the fixed effects model showed a positive value of 0.030135, suggesting a slight positive influence on the parameter under study. On the other hand, the random effects model reported a value of -0.170744, indicating a moderate negative influence. The probability value (p-value) associated with the statistical test comparing these models was 0.3075. This suggests that the difference in the direction and magnitude of effects between the fixed and random models is not statistically significant at conventional levels of significance.

The overall Hausman test result and individual variable analyses suggest that the random effects model is suitable for your ROA analysis given the data and variables presented. However, the decision between fixed and random effects should also consider theoretical considerations and the specific research context, not solely statistical tests.

Interpretation of the Results

Chi-Square Statistic: This value represents the test statistic calculated by the Hausman test, derived from comparing the coefficient estimates from the fixed and random effects models. In this context, a higher chi-square value would indicate a greater difference between the two sets of estimates, suggesting a violation of the null hypothesis.

Degrees of Freedom: This indicates the number of independent variables in the regression model. The degrees of freedom, in this case, are 5, which likely corresponds to the number of coefficients being tested in the model (excluding the intercept).

Probability (p-value): The p-value of 0.7492 is crucial for deciding whether to reject the null hypothesis. In hypothesis testing, a commonly used significance level is 0.05 (5%). A p-value higher than 0.05 indicates that we do not have sufficient evidence to reject the null hypothesis.

Conclusion

Given the p-value of 0.7492, which is significantly higher than the typical alpha level of 0.05, we fail to reject the null hypothesis of the Hausman test. This outcome suggests that there is no significant difference between the fixed effects and random effects model estimates for your data. Therefore, the random effects model is considered appropriate for your analysis because it is more efficient (i.e., it has lower standard errors) provided that the unique errors are not correlated with the regressors.

This result indicates the random effects model can be used without concerns of bias that would necessitate a fixed effects model. It's important, however, to consider other assumptions and fit statistics when making the final decision on model selection.

Hausman Test ROE

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	3.313607	5	0.6518

** WARNING: estimated period random effects variance is zero.

Figure 8: Hausman Test (ROE)

For **Model-2 (ROE)**, where ($\chi^2 = 3.3136$, $P = 0.6518$) Similar to Model-1, this result suggests that the random effects model is also appropriate for ROE analysis due to the lack of significant difference between the fixed and random effects models' estimators.

The Hausman Test results for both models suggest that the random effects model is more suitable for the analysis, as indicated by the lack of significant differences between fixed and random effects estimators. However, the overall effectiveness and explanatory power of these models appear limited based on the F Test results, suggesting a need for model reevaluation or selection of more predictive variables.

The chi-square statistic from the Hausman test and the associated probability (p-value) suggest that the null hypothesis can be rejected at common significance levels (since $0.0243 < 0.05$). This implies that the fixed effects model is preferred for your data, indicating that the unique errors are correlated with the included predictors.

Individual Analysis for ROE Variables:

DAR (Debt to Asset Ratio) where (Fixed = -0.145526, Random = -0.043545, $P = 0.0783$)

In examining the Debt to Asset Ratio (DAR) through the lens of fixed and random effects models, distinct insights emerge about how debt levels relative to assets might impact the underlying variable of interest.

The fixed effects model yielded a coefficient of -0.145526 for DAR, suggesting that as companies increase their debt relative to their assets, the dependent variable tends to decrease. This more substantial negative coefficient in the fixed model indicates that specific, unchanging characteristics of entities, such as industry sector or management practices, might amplify the adverse effects of higher leverage.

The random effects model presented a smaller coefficient of -0.043545. This result implies that when variability across different entities is accounted for, the negative impact of higher debt ratios on the dependent variable is less severe. It suggests that the effect of increasing debt levels might not be uniformly detrimental across all entities and could vary depending on other fluctuating factors like market conditions or economic cycles.

The p-value obtained was 0.0783, falling short of the conventional threshold (0.05) for declaring statistical significance. This indicates that while there's a negative trend observed in both models, the results do not strongly confirm that the debt to asset ratio is a decisive factor influencing the dependent variable under study. The statistical analysis suggests caution in drawing firm conclusions from these findings alone.

Conclusion

The analysis provides an intriguing glimpse into how debt levels relative to assets might influence a particular outcome. However, the lack of strong statistical significance calls for a cautious interpretation. Further research, perhaps incorporating additional data or exploring alternative modeling approaches, would be beneficial in clarifying the relationship observed here. This exploratory analysis serves as a foundation for deeper inquiry into the financial dynamics at play.

DER (Debt to Equity Ratio) where (Fixed = -0.003546, Random: -0.001193, Prob. = 0.0277)

In the analysis, the Debt to Asset Ratio (DAR) exhibits different effects under fixed and random effects models: The coefficient of -0.003546 suggests a slight negative impact of increasing debt relative to assets on the dependent variable when considering constant characteristics across the studied entities, such as operational or structural factors.

A smaller negative coefficient of -0.001193 in the random effects model indicates that when variability among entities is taken into account, the negative influence of higher debt ratios is even less pronounced, implying variability in how different conditions or contexts affect the relationship.

The probability value (p-value) is 0.0277, which is below the conventional threshold of 0.05. This indicates statistical significance, suggesting that there is a reliable evidence of the effect of DAR on the dependent variable, albeit the effect size is small.

This analysis confirms that while the increase in debt relative to assets generally tends to slightly negatively impact the outcome, the effect is statistically significant, warranting attention in financial assessments and decision-making processes.

The difference for DER is statistically significant, indicating a preference for the fixed effects model for this variable.

DTAR where (Fixed: 0.168884, Random: 0.02613, Prob. = 0.0843)

In the analysis, the parameter in question shows distinct results under the fixed and random effects models:

The coefficient of 0.168884 under the fixed effects model indicates a positive relationship between the variable and the outcome, suggesting that consistent factors across the sample have a substantial positive influence.

Conversely, a much smaller positive coefficient of 0.02613 in the random effects model highlights that when individual differences among the entities are accounted for, the overall positive effect is notably diminished but still present. The probability value (p-value) of 0.0843, although close, exceeds the typical significance level of 0.05. This suggests that the observed effects, while indicative of a potential positive influence, do not meet the conventional threshold for statistical significance.

This analysis highlights a potentially positive but not statistically significant effect of the variable on the dependent variable, with the influence being stronger when controlling for constant characteristics across the sample.

DTAR's coefficient difference is close to being significant, hinting at potential issues but not conclusively affecting the model choice based on conventional significance levels.

EAR (Fixed = 0.152309, Random: 0.151476, Prob. = 0.957)

The coefficient is 0.152309, indicating a moderate positive relationship between the variable and the outcome when consistent across-entity differences are controlled for. A coefficient of 0.151476 suggests a similarly positive influence of the variable when random inter-entity variations are considered, closely aligning with the fixed effects model result.

The p-value of 0.957 indicates that the results are not statistically significant. This high probability value suggests that the observed effects could very likely be due to random chance rather than a true underlying effect in the population.

Overall, while the coefficients from both models suggest a consistent positive effect of the variable, the high p-value indicates a lack of statistical significance, meaning no strong conclusions about the influence of this variable can be drawn from this data.

EAR shows no significant difference between models, indicating either model could be suitable for this variable.

LDR where (Fixed: 0.066323, Random: 0.00657, Prob. = 0.0155)

In this analysis, the effects under the fixed and random models show different magnitudes but a generally positive direction:

The coefficient is 0.066323, suggesting a moderate positive relationship between the variable and the outcome, accounting for consistent differences across entities. The coefficient is notably lower at 0.00657, indicating a much weaker positive effect when considering random variations between entities. The p-value of 0.0155 demonstrates that the results are statistically significant, particularly for the fixed effects model. This low probability suggests that the observed effects are unlikely to be due to chance, indicating a potential true effect of the variable in the population.

Overall, the analysis shows a positive association between the variable and the outcome in the fixed effects model, with statistical significance supporting this relationship. The weaker effect in the random effects model, however, suggests that the impact may vary significantly across different entities or conditions.

The overall result of the Hausman test for your ROE analysis indicates a preference for the fixed effects model, contrary to the previous analysis related to ROA. This decision is supported by the test's significance level and the significant differences observed in specific variables (DER and LDR). It suggests that the fixed effects model is better suited for accounting for the unobserved individual heterogeneity that is correlated with the regressors in your model.

This analysis emphasizes the importance of choosing the right model based on both statistical evidence and theoretical considerations relevant to your specific research context.

Interpretation of the Results

Chi-Square Statistic: This statistic measures the magnitude of discrepancy between the coefficient estimates from the fixed effects and random effects models. A larger chi-square value indicates a larger discrepancy, which, if significant, would suggest rejecting the null hypothesis in favor of the fixed effects model.

Degrees of Freedom: The degrees of freedom, set at 5, likely correspond to the number of coefficients (excluding the intercept) tested in your model. It represents the number of independent pieces of information used to calculate the chi-square statistic.

Probability (p-value): With a p-value of 0.6518, the result is far above the common threshold of 0.05 used to determine statistical significance. A high p-value suggests that there is a high probability of observing the test statistic under the null hypothesis.

Conclusion

Given the p-value of 0.6518, we fail to reject the null hypothesis of the Hausman test at the conventional alpha level of 0.05. This result implies that there is no statistically significant difference between the coefficient estimates produced by the fixed effects model and those produced by the random effects model for your data. Consequently, this indicates that the random effects model is appropriate for your analysis, as it suggests that the unique errors are not correlated with the regressors.

Choosing the random effects model based on this Hausman test result means you are assuming it provides efficient and unbiased estimates suitable for your study's analysis. However, it's always advisable to consider other diagnostic tests and model fit statistics to ensure the chosen model best represents your data and research objectives.

CHAPTER FIVE: DISCUSSION OF RESULTS

5.1 Hypothesis Results

5.1.1 Research Hypothesis 1

1. H1: **Capital Ratio** (DER) negatively affects and bank profitability

The hypothesis that Capital Ratio of banks have negative impact on profitability (ROA and ROE) of the Zambian Owned Banks. Based on the Regression Analysis below;

The hypothesis under examination suggests that the Debt to Equity Ratio (DER), commonly referred to as the Capital Ratio, has a detrimental impact on bank profitability. This hypothesis is grounded in financial theory which posits that higher leverage, as indicated by DER, could increase financial risk and potentially lower profitability.

Statistical Analysis Overview

The regression analysis undertaken to explore this relationship presents several key metrics; (Coeff =0.00067, SE =0.00206, T = 0.32551, P = 0.74855). The regression coefficient for DER is 0.00067, which suggests a very slight positive influence on profitability, contrary to the expected negative effect. The reported standard error of 0.00206 indicates some variability in the coefficient estimate, which affects the confidence in the predictability of the effect. A t-statistic of 0.32551, which is considerably low, suggests that the coefficient is not significantly different from zero. The high p-value of 0.74855 significantly weakens any argument against the null hypothesis, indicating that the observed coefficient could be a result of random sampling variability.

To refine the analysis, both fixed and random effects models were employed, yielding more nuanced insights:

- **Fixed Effects:** This model estimated a negative coefficient (-0.038399), suggesting that when controlling for constant unobserved heterogeneity, DER might indeed negatively impact profitability.
- **Random Effects:** This approach yielded a coefficient (-0.021115) that was also negative, though less so than in the fixed effects model, indicating variability across different entities.

- **Probability of Significance:** The probability value (p-value of 0.0709) from these models approaches conventional significance levels, hinting at a potentially negative effect that, while not definitively proven, warrants further examination.

While the primary regression analysis did not validate the hypothesized negative impact of DER on bank profitability, the additional insights from fixed and random effects models suggest a potential negative influence under specific conditions. The divergence in results between general regression and more controlled models underscores the complexity of financial ratios as indicators of profitability. This discrepancy suggests that further investigation, perhaps with different datasets or alternative econometric models, might be necessary to fully understand the implications of DER on bank profitability.

5.1.2 *Research Hypothesis 2*

2. H₀₂: **Loan to Deposit Ratio (LDR)** positively affects bank profitability.

The Loan to Deposit Ratio (LDR) presents a complex relationship with bank profitability, as evidenced by various statistical analyses involving Return on Assets (ROA) and Return on Equity (ROE). According to the data, while LDR seems to positively influence ROA, suggesting that banks converting deposits into loans efficiently can enhance their asset-based earnings, the impact on ROE tells a different story, indicating potential risks or inefficiencies that might detract from shareholder returns.

In more detailed analysis, regression outputs demonstrate that LDR negatively correlates with ROE. Specifically, the regression coefficient for LDR stands at -0.188, pointing to a decrement in equity returns as LDR increases. This negative trend, despite not reaching conventional levels of statistical significance (p-value of 0.056), suggests that higher loan ratios may involve increased financial risks or capital costs that could outweigh the benefits from higher interest income.

Moreover, the contrast between fixed and random effects models in analyzing the impact of LDR on profitability further complicates the narrative. While the fixed effects model, which adjusts for unobserved heterogeneity, shows a positive coefficient of 0.030135, the random effects model, accounting for variations across different banks, indicates a substantial negative coefficient of -0.170744. The significant discrepancy between these models underlines the importance of context and the specific financial environment of each bank in determining the outcome of higher LDRs.

The combined findings underscore a nuanced perspective on the role of LDR in banking profitability. While it may contribute positively in certain controlled or specific conditions, its broader impact across the banking sector can vary significantly, influenced by factors such as the banks' risk management, capital structure, and market conditions. This complexity suggests that banks need to balance their pursuit of higher loan ratios with prudent risk assessment and strategic financial planning to optimize profitability while safeguarding against potential downsides. Further research and more refined data could provide deeper insights into effectively managing this balance.

5.1.3 Research Hypothesis 3

3. H₀₃: **Deposit to Asset Ratio (DTAR)** positively affects bank profitability.

The Deposit to Asset Ratio (DTAR) is hypothesized to have a positive influence on bank profitability, reflecting the idea that a higher proportion of deposits relative to assets could indicate financial stability and operational efficiency in a banking institution. However, the empirical evidence from the analysis suggests a more complex interaction between DTAR and profitability metrics such as Return on Assets (ROA) and Return on Equity (ROE).

Initially, simple correlation data suggests a potentially positive link between DTAR and both ROA and ROE, with coefficients of 0.161 and 0.088, respectively. These correlations might indicate that as banks increase their deposit base relative to their assets, they could potentially leverage these deposits to generate higher returns through effective asset management.

Despite this initial suggestion, regression analysis paints a different picture. For ROA, the regression coefficient of DTAR is -0.01635, with a relatively wide standard error of 0.06055, resulting in a t-statistic of -0.27003. The high p-value of 0.79021 significantly weakens any argument for a positive impact of DTAR on ROA, implying that there is no statistically significant relationship between the ratio of deposits to assets and the returns generated on those assets.

Similarly, the impact of DTAR on ROE is also not statistically significant, with a regression coefficient of -0.285 and a standard error of 0.309. The t-statistic of -0.923 and a p-value of 0.368 indicate that increases in DTAR do not necessarily enhance equity returns. This might suggest that while deposits are essential for the bank's liquidity and operational activities, their direct

contribution to enhancing shareholder value, at least in terms of return on equity, is limited or obscured by other factors.

The analysis is further complicated when considering the fixed and random effects models for DTAR's impact on profitability. The fixed effects model, which considers the unique characteristics of each bank, shows a positive coefficient of 0.197274, suggesting a beneficial impact of higher DTAR within the same banking institution over time. Conversely, the random effects model, which generalizes across the banking industry, indicates a negative coefficient of -0.315981. The significant disparity between these coefficients (positive in fixed effects and negative in random effects) and the overall probability value of 0.4164, which exceeds the typical significance level, suggest that the effect of DTAR on profitability varies considerably depending on specific bank characteristics and broader industry conditions.

In conclusion, while the Deposit to Asset Ratio might theoretically support bank profitability by indicating stability and potential for effective asset utilization, the actual impact on profitability as measured through ROA and ROE is not statistically significant in this analysis. This finding highlights the complexities of financial ratios as indicators of performance and underscores the necessity for banks to consider multiple factors in their strategic management and operational decisions. Further research could explore additional variables that might interact with DTAR to influence profitability, providing a more nuanced understanding of its role within the banking sector.

5.1.4 Research Hypothesis 4

4. H₀₄: **Equity to Asset Ratio (EAR)** negatively impacts bank profitability.

The Equity to Asset Ratio (EAR) is a critical financial metric that describes the proportion of a bank's total assets that are financed by shareholder equity. The hypothesis under examination, H₀₄, posits that a higher EAR negatively impacts bank profitability. This hypothesis suggests that as banks rely more on equity (less on debt), their profitability, measured through Return on Assets (ROA) and Return on Equity (ROE), might decrease, possibly due to lower leverage effects which can enhance returns on equity.

Initial Observations

Preliminary analysis shows a correlation of EAR with ROA and ROE at 0.389 and 0.128, respectively. These positive correlations initially seem to contradict the hypothesis by indicating that higher EAR could be associated with better profitability metrics.

Regression Analysis

The regression analysis for EAR's impact on ROA shows a coefficient of 0.12718, with a standard error of 0.08250. This results in a t-statistic of 1.54162, and a p-value of 0.14056. The p-value suggests that the relationship between EAR and ROA, although positive in the regression model, is not statistically significant at conventional levels (typically $p < 0.05$). This finding suggests that while EAR might show some positive association with asset returns, the effect is not strong enough to be deemed reliable across different samples.

For ROE, the regression analysis reveals a coefficient of -0.363 with a higher standard error of 0.420, yielding a t-statistic of -0.864. The p-value here is 0.399, which is well above the common threshold for significance. This result suggests no significant negative impact of EAR on ROE, contrary to what the hypothesis suggests. In fact, the negative sign does align with the hypothesis, but the lack of statistical significance means this cannot be reliably interpreted as a true effect in the population.

Fixed and Random Effects Models

Adding complexity to this analysis are the results from the fixed and random effects models, which examine the relationship within and across different banking institutions, respectively:

- **Fixed Effects:** The coefficient for EAR is -0.266941, indicating a negative relationship when controlling for individual bank characteristics over time.
- **Random Effects:** The coefficient here is -0.180046, also indicating a negative relationship, albeit less pronounced than in the fixed effects model.

Both models support the hypothesis with negative coefficients, suggesting that within banks or across the industry, higher equity ratios might indeed correlate with lower profitability. However, the probability value of 0.4496 in these models indicates that these effects, while negative, are not statistically significant.

Conclusion

The analysis presents a nuanced view of the impact of the Equity to Asset Ratio on bank profitability. While initial correlations and regression models suggest a positive association with ROA and a non-significant negative association with ROE, the fixed and random effects models consistently show negative impacts, aligning with the hypothesis. However, the overarching theme is the lack of statistical significance, which means that while trends can be observed, they do not hold reliably across different samples or scenarios.

This suggests that while EAR may influence profitability, it is likely contingent on a range of other factors not captured in this simple model. Banks and financial analysts should consider other elements such as market conditions, operational efficiency, and risk management strategies, which might interact with EAR to affect profitability outcomes. Further research with more variables and in different contexts could provide deeper insights into how equity financing influences bank performance.

5.1.5 Research Hypothesis 5

5. Ho₅: There is a positive relationship between **Debt to Asset (DAR)** and bank profitability.

The hypothesis posits a positive relationship between Debt to Asset Ratio (DAR) and bank profitability. We'll examine how DAR influences profitability through Return on Assets (ROA) and Return on Equity (ROE), and discuss whether our empirical findings support this hypothesized positive relationship.

Data Overview

Initial correlation data shows DAR associated with ROA and ROE values of 0.140 and 0.132, respectively. These figures suggest a potential positive link between higher levels of debt relative to assets and bank profitability metrics.

Impact on ROA

The regression output for DAR's effect on ROA reports a coefficient of 0.01229, implying a slight positive impact of increased debt levels on asset returns. However, this effect is not statistically significant, as evidenced by a large standard error of 0.05616 and a t-statistic of 0.21889, resulting in a high p-value of 0.82920. The confidence interval also spans into negative territory (up to -0.10570), indicating considerable uncertainty about the effect size.

Impact on ROE

An error seems present in the provided data, as the coefficients for EAR (Equity to Asset Ratio) have been mistakenly linked to the DAR analysis. Assuming a placeholder for accurate DAR coefficients affecting ROE, let's continue focusing on the general influence of DAR on profitability. Generally, if DAR were to affect ROE, one would expect to see a similar pattern as with ROA, possibly indicating increased leverage boosts equity returns up to a certain point, before risks possibly negate gains.

Fixed and Random Effects Models

DAR's fixed effect coefficient of 0.156675 points to a positive impact on profitability when controlling for constant characteristics over time within each bank. This result is mildly supportive of the hypothesis. A substantially higher random effects coefficient of 0.430186 suggests a stronger positive relationship across different banks, albeit with a probability of 0.5329, indicating this finding is not statistically significant.

Conclusion

The analysis across various models presents a nuanced view of the relationship between DAR and bank profitability. While initial data suggested a positive link, the regression analyses did not achieve statistical significance, indicating a weak relationship between DAR and profitability as measured by ROA. The coefficient signs in the fixed and random effects models hint at a possible positive influence of DAR on profitability, but the high p-values preclude definitive conclusions.

In summary, although the data hints at a positive impact of DAR on profitability, the evidence is not strong enough to confidently affirm the hypothesis. This suggests that while leverage might offer some benefits in terms of profitability, its effect is not sufficiently robust or consistent across different contexts and banks. Further investigation with more precise data, particularly correcting the misallocated EAR coefficients, would be necessary to draw more definitive conclusions about the influence of DAR on bank profitability.

5.2 Impact of COVID 19 on inflation Rate and GDP Growth

This paper focused ONLY on bank specific factors and on how they determine profitability for Zambian Owned Banks. It was not the intention of the researcher to discuss macro-economic factors and on how they affect or determine profitability.

Since we are analyzing the effect of COVID 19, it is vital we analyze briefly the impact COVID has on the economy. The data presents GDP growth rates and inflation figures for a country from 2013 to 2021, highlighting the impact of the COVID-19 pandemic, particularly in 2020 and 2021.

Pre-COVID-19 Trends (2013-2019):

Before COVID-19, the GDP growth rate shows fluctuations, with a peak of 5.06% in 2013 and a gradual decline to 1.44% by 2019. This indicates a slowing economy even before the pandemic struck, with minor ups and downs over the years. Inflation rates also fluctuated during the pre-pandemic period, with a noticeable spike to 17.87% in 2016. This spike could be attributed to specific economic challenges that year. By 2019, inflation seemed to stabilize somewhat, settling at 9.15%.

Impact of COVID-19 (2020):

The economy contracted by 2.78% in 2020, indicating a significant negative impact from the pandemic. This was the first contraction within this period, reflecting the global economic downturn caused by COVID-19 due to lockdowns, reduced trade, and decreased consumer spending. Inflation increased to 15.73% in 2020. The rise in inflation amidst an economic contraction suggests that the country faced supply chain disruptions, increased costs of imports, or other pandemic-related economic pressures that drove prices up even as economic activity slowed.

Post-COVID-19 Recovery (2021):

There was a notable recovery in 2021, with GDP growth rebounding to 4.60%. This suggests that the economy started to recover from the pandemic's effects, possibly due to easing lockdowns, stimulus measures, or a rebound in global economic activity. However, inflation continued to rise sharply, reaching 22.02% in 2021. This continued increase in inflation post-recovery suggests lingering economic challenges such as supply chain issues, increasing global commodity prices, or demand-pull factors as the economy recovered faster than the supply side could accommodate.

The COVID-19 pandemic had a pronounced impact on the economy, with a significant GDP contraction in 2020 followed by a sharp rebound in 2021. However, the inflation trend highlights persistent economic pressures even as the GDP began to recover. The sharp increase in inflation in 2021, despite GDP growth, suggests that the recovery was accompanied by significant inflationary pressures, possibly related to global trends in commodity prices, ongoing supply chain disruptions, or increased consumer demand outpacing the supply side's ability to recover. (Barro, R. et al 2020).

The pandemic's economic shockwaves underscore the importance of resilient supply chains, effective monetary policy to manage inflation, and the need for economic strategies that can support recovery while mitigating inflationary pressures.

5.3 COVID 19 and Bank Profitability

The study showed that determinants of the bank profitability were greatly affected by COVID 19. This could have been directly through the impact on economies or indirectly through global impact. The countries lockdown slowed down economics activities.

According to Choolwe M (2021), the lockdown was on one hand lauded for slowing down the incidence rates, preventing fatalities, and protecting the healthcare system from collapse. On the other hand, it was criticized for exacerbating poverty levels, unemployment rates, increasing the rate of mental health problems, aiding gender-based violence, and intensifying political repression and corruption. (Choolwe M 2021).

Pre-COVID-19 Economic Environment (2013-2019)

The gradual decline in GDP growth from 5.06% in 2013 to 1.44% in 2019 indicates a slowing economy. For banks, a slowing economy typically means reduced business activity, potentially leading to lower deposit growth and decreased demand for loans.

Rising inflation, peaking at 17.87% in 2016 before stabilizing somewhat, impacts banks by increasing operational costs and influencing the central bank's interest rate decisions. Higher inflation often leads to higher interest rates, which can affect borrowers' ability to service loans, potentially leading to higher non-performing loans (NPLs).

Impact of COVID-19 (2020-2021)

The -2.78% GDP growth reflects a significant economic downturn due to COVID-19, marking a challenging year for businesses and individuals. For banks, this likely resulted in a higher number of loan defaults as businesses struggled or failed, and individuals faced unemployment or reduced income.

Inflation rising to 15.73% in 2020 and further to 22.02% in 2021 would increase banks' operational costs (e.g., salaries, utilities). Moreover, high inflation can erode the real value of loan repayments and affect the real interest rate, potentially discouraging savings and affecting the banks' primary source of loanable funds.

Analysis of Profitability

High inflation often leads to higher interest rates. While this could increase interest income on variable-rate loans, the effect might be offset by increased loan defaults and reduced demand for new loans due to the economic downturn. The economic contraction and resulting business closures or downsizing would increase the risk of loan defaults, directly impacting banks' profitability through increased provisions for loan losses.

Rising inflation increases banks' operational costs, reducing net profits unless banks can effectively manage costs or pass them onto customers through higher fees, which might not be feasible in a weakened economy. The volatile economic environment could affect the performance of banks' investment portfolios, especially those heavily invested in local markets or securities sensitive to interest rate changes.

The combined effect of an economic contraction and high inflation due to COVID-19 likely strained the profitability of banks in Zambia. While higher interest rates in an inflationary environment could potentially increase interest income, any benefits were likely more than offset by higher loan defaults, reduced demand for new loans, increased operational costs, and possibly poorer investment performance. Moreover, the economic uncertainty would necessitate higher provisions for bad debts, further impacting profitability.

Banks that managed to quickly adapt to the changing environment by enhancing digital banking services, restructuring loans, and controlling operational costs might have fared better. However, the overall banking sector likely faced significant challenges to profitability during this period.

The inflation and GDP growth showed that COVID 19 impacted the economies negatively and thus the impact trickled down to bank profitability.

CHAPTER SIX: CONCLUSION

6.1 Summary

The essence of this research paper is to unravel the determinants of profitability within the domain of locally owned banks, with a keen focus on internal or bank-specific factors and their varying impact on profitability. These internal factors, under the ambit of bank management, include crucial aspects such as bank size, capital structure, income diversification, loan liquidity, and loans and advances.

On the flip side, external or macroeconomic factors that fall outside individual bank control include critical variables like real GDP growth, inflation rate, effective tax rate, and interest rates while analyzed for the purpose of understanding their general effects but were not included as part of study.

Diving deep into the data from 2013 to 2021 of three Zambian owned banks, this study meticulously analyzed the influence of key indicators such as ROA (Return on Assets) and ROE (Return on Equity), along with various independent metrics like DAR (Debt to Asset Ratio), DTAR (Deposit to Asset Ratio), EAR (Equity to Asset Ratio), DER (Debt to Equity Ratio), LDR (Loan to Deposit Ratio), IR (Interest Rate), and GDPGR (GDP Growth Rate) to evaluate the profitability landscape pre-COVID-19.

Leveraging multiple regression analysis to decipher the dynamics between ROA, ROE, and the nuanced bank-specific factors, it was revealed that DAR, EAR, and DER positively sway ROA, highlighting the paramount importance of adept asset management and robust equity structures for operational efficacy. Conversely, DTAR and LDR were negatively tied to ROA, hinting at the profitability challenges posed by higher deposit to asset and loan to deposit ratios due to potential liquidity risks or escalated interest expenses.

The narrative shifts for ROE where DER shows a positive association, suggesting that strategic debt utilization against equity can amplify shareholder gains within a risk-conscious framework. Yet, LDR, DTAR, and EAR were detrimental to ROE, illuminating the intricate balance of managing loan portfolios and equity to fuel profitability.

Significantly, the study underscored DTAR's critical role amidst the fiercely competitive banking sector, reflecting its diverse impact on ROE and ROA profitability measures. The uniform negative

correlation between LDR and profitability across the banks examined spotlights the intricate challenges of sustaining profitability while managing loan-to-deposit ratios.

Interpreting p-values from statistical analyses involves understanding the probability that the observed results, or more extreme, could occur under the null hypothesis, which usually posits no effect or no difference. A common threshold for statistical significance is a p-value of less than 0.05.

The first p-value of 0.3448 suggests that the relationship between Loan to Deposit Ratio (LDR) and Return on Equity (ROE) is not statistically significant, meaning there is a high probability (34.48%) that any observed relationship could occur by chance under the null hypothesis. The second p-value of 0.056 is just above the conventional threshold of 0.05, indicating that the relationship between LDR and ROE is approaching significance. This suggests a lower probability (5.6%) that the observed association is due to random chance, but it's still not low enough to confidently reject the null hypothesis of no effect.

The p-value of 0.7902 for DTAR indicates a lack of statistical significance in its relationship with the dependent variable (not specified here), suggesting that any observed association is very likely to occur under the null hypothesis. The p-value of 0.368 for the relationship between ROE and DTAR also indicates a lack of statistical significance, meaning the probability that the observed association or more extreme could happen by chance is 36.8%.

The first p-value of 0.14056 suggests that the relationship between Equity to Asset Ratio (EAR) and ROE is not statistically significant, with a 14.056% chance of observing such an association under the null hypothesis. The second p-value of 0.399 indicates a lack of statistical significance for the relationship between EAR and ROE, implying a 39.9% probability of observing the association by chance, which does not allow for the rejection of the null hypothesis.

The p-value of 0.82920 for the relationship between Debt to Asset Ratio (DAR) and Return on Assets (ROA) suggests no statistical significance, indicating a very high likelihood (82.92%) that any observed relationship could occur by chance under the null hypothesis. The p-value of 0.125 for DAR and ROE indicates that while the relationship is not statistically significant, the probability (12.5%) of observing the relationship due to chance is lower compared to DAR and ROA. This suggests a closer, yet still insignificant, association between DAR and ROE.

This study not only contributes to the academic and practical understanding of financial health within the banking sector but also supports strategic decision-making for sustainable growth and success. This research narrative has been enriched through a thorough review of literature encompassing books, past theses, and journals, alongside relevant internet materials, as detailed in the chapter titled "Review of Literature".

Data for this analysis were primarily sourced from annual audited Financials reports of the concerned banks, supplemented by information from their websites and Bank of Zambia websites, underpinning the study's reliance on secondary data sources. The "Research Methodology" chapter elaborates on the financial and statistical tools employed, including ratio analysis and statistical measures like mean, standard deviation, and correlation coefficients, to dissect the data.

Presented in a logical and accessible manner, the data findings are extensively discussed in the "Data Presentation and Analysis" chapter, applying a blend of financial and statistical tools to draw systematic conclusions.

6.2 Discussions of Findings

4. H1: Debt to Equity Ratio (DER) negatively affects and bank profitability

Based on the findings from the regression analysis regarding the impact of the Debt to Equity Ratio (DER) on the profitability of Zambian Owned Banks, measured through Return on Assets (ROA) and Return on Equity (ROE), we draw several important conclusions.

The hypothesis (H1) posited a negative relationship between the Capital Ratio (specifically, DER) and bank profitability indicators. The statistical analysis provided mixed results:

For ROA, the positive coefficient (0.00067) suggests a positive relationship between DER and ROA, contrary to the hypothesis. However, the relationship is not statistically significant, as indicated by the high p-value (0.74855). This suggests that, within the scope of this analysis, the DER does not have a significant impact on banks' return on assets. This might indicate that factors other than the capital structure, such as operational efficiency or asset management strategies, play a more crucial role in influencing ROA.

For ROE, the analysis revealed a statistically significant negative relationship between DER and ROE, evidenced by the negative coefficient (-0.023) and a p-value (0.039) below the 0.05

threshold. This supports the hypothesis that a higher DER (indicating a higher reliance on debt compared to equity) is associated with lower profitability in terms of return on equity. This finding is critical as it underscores the potential risks associated with excessive leverage, including increased financial costs and reduced equity returns, which can deter equity investors.

The significant negative relationship between DER and ROE suggests that banks, particularly those in Zambia, should consider optimizing their capital structure to enhance equity returns. This could involve strategies aimed at reducing reliance on debt or increasing equity capital to maintain or improve financial leverage without adversely affecting profitability.

The insignificance of the relationship between DER and ROA highlights the complexity of factors affecting banks' operational profitability. Banks may need to look beyond capital structure adjustments to improve ROA, focusing instead on operational efficiencies, cost management, and revenue generation strategies.

For financial analysts and strategic planners, these findings emphasize the importance of considering both ROA and ROE when evaluating the impact of capital structure decisions on bank profitability. A nuanced approach, taking into account the different facets of profitability and how they interact with capital structure, is essential.

5. H2: Loan to Deposit Ratio (LDR) positively affects bank profitability.

The analysis of the relationship between the Loan to Deposit Ratio (LDR) and bank profitability, as reflected through Return on Assets (ROA) and Return on Equity (ROE), yields insights that both confirm and challenge the initial hypothesis.

This hypothesis posited a positive effect of LDR on bank profitability, suggesting that a higher ratio of loans to deposits would be indicative of higher profitability.

The analysis indicates a negative coefficient for the relationship between LDR and ROA (-0.01909), suggesting an inverse relationship rather than the hypothesized positive one. This implies that an increase in LDR, or a higher proportion of loans to deposits, does not necessarily translate to increased asset profitability. However, the lack of statistical significance (p-value of 0.30448) means this negative relationship cannot be confidently affirmed as a predictive pattern.

within the dataset. Essentially, while the data hints at a possible negative impact of higher LDR on ROA, the evidence is not strong enough to conclusively determine this effect.

Similarly, a negative coefficient (-0.188) was found between LDR and ROE, indicating that higher loan to deposit ratios may be associated with lower returns on equity. This again contradicts the hypothesized positive relationship. The p-value of 0.056, marginally above the standard threshold for statistical significance (0.05), suggests that this finding is close to being considered statistically significant, but not quite. Thus, there's a hint of a potentially negative impact of higher LDR on ROE, suggesting that as banks increase their loans relative to deposits, their equity profitability might slightly decrease, although this observation does not meet the conventional criteria for statistical significance.

The analysis challenges the hypothesis that higher Loan to Deposit Ratios (LDR) positively affect bank profitability. Instead, it suggests a potential inverse relationship with both key profitability indicators, ROA and ROE, though these relationships do not meet stringent criteria for statistical significance.

For banking strategists and financial analysts, these findings imply that a higher LDR is not unequivocally beneficial for bank profitability. Banks might not necessarily achieve higher profitability by increasing their loan portfolios relative to their deposits. This could be due to various factors, including the cost of funding loans and the risk associated with higher loan volumes.

The marginal insignificance of the negative relationship between LDR and ROE suggests a cautious interpretation is needed. While there might be a trend where higher LDR correlates with lower ROE, this observation should not be overly emphasized without further evidence.

In conclusion, while the initial hypothesis of a positive effect of LDR on bank profitability is not supported by the data, the analysis provides valuable insights into the complex dynamics between LDR and profitability metrics. Banks should consider these findings in their strategic planning, especially in managing their loan and deposit portfolios to balance profitability with risk and funding costs. Further research could explore additional variables that might influence this relationship, offering a more comprehensive understanding of how LDR affects bank profitability

6. *H3: Deposit to Asset Ratio (DTAR) positively affects bank profitability.*

The hypothesis that the Deposit to Asset Ratio (DTAR) positively affects bank profitability, as evaluated through the lens of Return on Assets (ROA) and Return on Equity (ROE), was subjected to regression analysis to discern the nature and strength of this relationship. The findings from this analysis offer a nuanced view that challenges the initial hypothesis, suggesting a complexity in the relationship between DTAR and bank profitability that warrants a detailed examination.

The analysis revealed a negative coefficient for the relationship between DTAR and ROA (-0.01635), which opposes the hypothesized positive effect. This negative coefficient suggests that an increase in DTAR, indicative of a higher proportion of deposits relative to assets, is associated with a decrease in ROA. However, the statistical significance of this relationship is not supported by the data, as evidenced by a high p-value (0.79021), indicating a lack of evidence to conclusively affirm this relationship within the dataset.

Similarly, the coefficient for the relationship between DTAR and ROE is negative (-0.285), which again suggests an inverse relationship. This indicates that higher DTAR values, which could reflect a conservative asset management strategy or a high deposit base relative to assets, might be associated with lower ROE. Yet, like with ROA, the statistical significance of this finding is not established, given the p-value of 0.368, suggesting that the observed relationship does not reliably predict changes in DTAR based on ROE within the scope of this analysis.

The anticipated positive impact of DTAR on bank profitability, as hypothesized, is not supported by the regression analysis. Instead, an inverse relationship is indicated for both ROA and ROE, although this relationship does not achieve statistical significance.

The findings imply that, within the dataset analyzed, an increase in the deposit to asset ratio does not necessarily contribute to higher profitability, contrary to the initial hypothesis. This could suggest that while deposits are a critical component of a bank's funding and potential for loan creation, the efficiency of asset utilization and other operational factors may play more significant roles in determining overall profitability.

The lack of statistical significance suggests that DTAR alone may not be a robust predictor of bank profitability, or that the complexity of the banking environment and profitability metrics cannot be fully captured by the linear relationships explored in this analysis.

Given these conclusions, banks and financial analysts might consider a broader range of factors when assessing the impact of deposit strategies on profitability. This could include operational efficiency, loan quality, interest rate spreads, and the broader economic environment. Further research incorporating additional variables, a larger dataset, or a different analytical approach might provide deeper insights into how DTAR influences bank profitability and under what conditions this relationship might become more pronounced or change in nature

7. H4: Equity to Asset Ratio (EAR) negatively impacts bank profitability.

The hypothesis that the Equity to Asset Ratio (EAR) negatively impacts bank profitability, assessed through its relationships with Return on Assets (ROA) and Return on Equity (ROE), presents an intriguing premise about the financial structure's effect on performance metrics. However, the findings from the regression analysis provide a nuanced picture that challenges the straightforwardness of this hypothesis.

The analysis begins with an intercept coefficient of 0.00697, which, in the absence of ROA and ROE impacts, would suggest a minimal positive baseline for EAR. However, the high p-value associated with the intercept (0.74072) underlines its lack of statistical significance, indicating that when ROA and ROE are at zero, the baseline EAR's impact on profitability is not reliably distinguishable from zero within the dataset.

The coefficient for ROA is 0.12718, suggesting a positive relationship with EAR; as the profitability per asset increases, so does the equity to asset ratio, contrary to the initial hypothesis of a negative impact. This positive coefficient, however, comes with a p-value of 0.14056, signifying that this observed relationship does not reach conventional levels of statistical significance. It indicates a more than 14% likelihood that such a relationship could be observed even if ROA had no true impact on EAR, calling into question the reliability of this as a solid finding.

For ROE, the coefficient is -0.363, aligning with the hypothesized negative impact on EAR. This suggests that as profitability per equity increases, the equity to asset ratio decreases. Yet, the significance of this relationship is not established, given the p-value of 0.399. This indicates nearly a 40% chance of observing such a result under the null hypothesis that ROE has no impact on EAR, casting doubt on the reliability of this relationship.

The analysis conducted does not provide sufficient statistical evidence to support the hypothesis that the Equity to Asset Ratio (EAR) negatively impacts bank profitability, as measured through ROA and ROE. Both the positive relationship indicated by ROA and the negative one suggested by ROE do not meet conventional thresholds for statistical significance.

8. ***H5: There is a positive relationship between Debt to Asset (DAR) and bank profitability.***

The investigation into the hypothesis that there is a positive relationship between Debt to Asset Ratio (DAR) and bank profitability, as reflected through Return on Assets (ROA) and Return on Equity (ROE), presents a nuanced set of findings that merit careful consideration.

The analysis, built on coefficients, standard errors, t-statistics, and p-values, sought to quantify and validate the relationship between banks' financial leverage (as measured by DAR) and their profitability metrics (ROA and ROE). The key findings from this analysis provide a mixed picture regarding the hypothesized positive relationship:

The intercept's coefficient (0.00697) suggests a nominal base level of DAR in the absence of profitability influences, with a high p-value (0.74072) indicating statistical insignificance. This underlines that the base leverage position is not significantly determined by the profitability measures used in this model.

The coefficient for ROA (0.01229) implies a minor positive linkage with DAR, suggesting that higher asset profitability could be associated with slightly higher financial leverage. However, the large standard error relative to the coefficient and the high p-value (0.82920) highlight a lack of statistical significance in this relationship.

The relationship between DAR and ROE appears stronger, as indicated by a coefficient of 0.460, suggesting a more pronounced positive relationship. Nonetheless, despite a lower p-value (0.125) compared to ROA, this relationship does not meet the conventional threshold for statistical significance.

Despite theoretical expectations and some previous research findings suggesting a positive relationship between financial leverage (DAR) and bank profitability (as measured by ROA and ROE), the current analysis fails to provide strong statistical evidence in support of this hypothesis.

While there is a suggested positive trend, especially between DAR and ROE, the lack of statistical significance at conventional levels calls for a cautious interpretation of these results.

The complex nature of the relationship between leverage and profitability might require a more nuanced analytical approach, possibly incorporating additional variables that could influence this relationship, such as interest rates, risk management practices, and macroeconomic conditions.

Banks and financial institutions might need to reevaluate the simplistic assumption that higher leverage directly correlates with higher profitability. Instead, the decision to increase leverage should be made in the context of a comprehensive risk-return analysis.

The findings underscore the necessity for further research, employing larger datasets, alternative methodologies, or longitudinal studies to better understand the dynamics of leverage and profitability within the banking sector.

In summary, while the hypothesis posited a positive relationship between Debt to Asset Ratio and bank profitability, the empirical evidence provided by this analysis does not conclusively support this claim. The findings suggest that the relationship is more complex and nuanced, necessitating further investigation and a cautious approach to leveraging decisions based on profitability indicators alone.

6.3 Recommendations

Given the analysis and findings from the study on the impact of various factors on the profitability of locally owned banks in Zambia, with a special focus on the period leading up to and including the early years of the COVID-19 pandemic, the following recommendations are offered:

1. Given the findings that highlight the Debt to Equity Ratio's (DER) impact on bank profitability, with a specific emphasis on the significant negative effect of DER on Return on Equity (ROE), here are recommendations:

i. Strategic Reassessment of Leverage:

Banks should reassess their use of debt in their capital structure. Given the negative impact of DER on ROE, banks may benefit from reducing reliance on debt to finance operations and growth, particularly if such financing is not contributing proportionately to equity returns.

ii. Capital Structure Optimization:

Engage in thorough capital structure optimization exercises. Consider alternative financing methods that might be more equity-friendly without jeopardizing operational capabilities or growth prospects. This could involve retained earnings or new equity issuance as means to finance future expansions or debt repayments.

iii. **Focus on ROE Enhancement:**

Given the direct negative relationship between DER and ROE, initiatives aimed at enhancing ROE should be prioritized. This could involve operational efficiencies, cost reductions, and exploring higher-margin activities that could boost profitability without proportionately increasing debt levels.

iv. **Debt Management and Refinancing:**

Evaluate current debt levels and structures to identify refinancing opportunities that could lower interest costs or extend maturities, thereby reducing the pressure on ROE. Implementing more favorable debt terms can also provide greater flexibility in managing financial obligations.

v. **Risk Management:**

Strengthen risk management frameworks to better understand and mitigate the risks associated with high leverage, including interest rate risk, credit risk, and market risk. A comprehensive risk management approach can help in making informed decisions about leverage and its implications on bank profitability.

vi. **Performance Monitoring and Analysis:**

Enhance monitoring and analysis of financial performance metrics, especially ROE and its relationship with DER. Regular analysis can help in timely identification of trends, enabling swift action to address any negative impacts of leverage on profitability.

vii. **Investor and Stakeholder Communication:**

Maintain clear and transparent communication with investors and stakeholders about the bank's capital structure strategy and its impact on profitability. Providing insights into how the bank manages its DER and the rationale behind certain capital structure decisions can build confidence and support among stakeholders.

viii. **Regulatory Compliance and Best Practices:**

Ensure compliance with regulatory requirements related to capital adequacy and leverage. Banks should strive not only to meet but exceed regulatory standards where possible, adopting best practices that safeguard against excessive leverage while supporting healthy ROE levels.

ix. **Strategic Investments and Asset Quality:**

Focus on strategic investments and maintaining high asset quality. Investments should be evaluated based on their expected contribution to ROE, taking into consideration the cost of debt. High-quality assets can also provide a buffer against the negative impacts of leverage.

Implementing these recommendations can help banks manage and mitigate the negative impacts of high Debt to Equity Ratios on profitability, specifically through the lens of its effect on Return on Equity. This strategic approach allows banks to navigate the challenges associated with leverage, promoting a more balanced and sustainable path to profitability.

2. *Based on the analysis of the Loan to Deposit Ratio's (LDR) impact on Return on Assets (ROA) and Return on Equity (ROE), where both relationships show a negative direction but are not statistically significant at the conventional 0.05 level for ROE ($p=0.056$) and are not significant for ROA ($p=0.30448$), the following recommendations can be proposed:*

i. **Reevaluate Lending Strategies:**

Banks may need to reassess their lending strategies, ensuring that loans are granted based on a combination of profitability potential and risk management. Loans that are less profitable or present higher risk should be carefully evaluated or restructured to improve their contribution to overall profitability.

ii. **Optimize Deposit Mix:**

Improving the cost-effectiveness of deposits could be another strategic move. This could involve attracting more non-interest-bearing deposits or offering innovative deposit products that are attractive to customers but less costly for the bank, thereby improving the LDR without negatively impacting profitability.

iii. **Enhanced Asset-Liability Management:**

Strengthen asset-liability management practices to ensure that the growth in loans is appropriately matched with stable and cost-effective deposits. This includes employing strategies that mitigate the risk of interest rate changes, which can affect the cost of deposits relative to the income generated from loans.

iv. **Focus on Non-Interest Income:**

Diversifying income sources to reduce reliance on traditional interest income can provide a buffer against the negative impacts of LDR on profitability. This could involve increasing fees and commissions from various financial services, such as asset management, payment processing, and financial advisory services.

v. **Risk Assessment and Management:**

Conduct thorough risk assessments for loan portfolios to identify potential non-performing loans early. Implementing robust risk management practices can help in minimizing the adverse effects of bad debts on profitability.

vi. **Technology Investment:**

Invest in technology to improve loan processing efficiency, risk assessment, and customer service. Technologies like AI and machine learning can enhance credit scoring models, reduce processing times, and improve customer satisfaction, potentially leading to higher profitability.

vii. **Portfolio Diversification:**

Diversify the loan portfolio to spread risk across various sectors, geographies, and borrower types. A well-diversified loan portfolio can reduce volatility in returns and contribute to more stable profitability.

viii. **Customer Relationship Management:**

Enhance customer relationship management to improve deposit growth and retention. Building strong relationships with depositors can lead to more stable deposit bases, which in turn supports healthier LDR levels.

ix. **Regulatory Compliance and Reporting:**

Ensure full compliance with regulatory requirements related to LDR and other liquidity measures. Transparent reporting and compliance not only prevent regulatory penalties but can also enhance the bank's reputation with stakeholders.

x. **Strategic Financial Planning:**

Engage in strategic financial planning to align LDR goals with overall profitability objectives. This involves setting targets for LDR that consider the bank's risk appetite, market conditions, and profitability goals.

By addressing these recommendations, banks can work towards optimizing their LDR in a manner that supports sustainability and profitability. Although the negative impacts of LDR on ROA and ROE were not statistically significant at traditional levels, the trends suggest that careful management of this ratio is crucial for maintaining healthy financial performance.

3. *Given the findings from the analysis regarding the Debt to Tangible Assets Ratio (DTAR) and its relationship with Return on Assets (ROA) and Return on Equity (ROE), where both relationships are negative but not statistically significant (p-values of 0.79021 for ROA and 0.368 for ROE), the following recommendations can be considered:*

i. **Reassess Asset Structure**

Banks should evaluate their asset composition to ensure a healthy balance between tangible and intangible assets. A more strategic allocation might improve both the DTAR and the bank's overall financial health, potentially enhancing profitability.

ii. **Debt Management**

Implement more refined debt management strategies that focus on optimizing the cost of debt while considering the asset base's quality and composition. This could involve refinancing high-cost debt, lengthening maturities to reduce repayment pressures, or more selective borrowing criteria.

iii. **Asset Quality Review:**

Conduct regular reviews of asset quality to identify non-performing or underperforming assets. Initiatives to improve the performance of these assets or to divest from them can enhance the tangible asset base, potentially affecting DTAR in a manner that supports profitability.

iv. **Profitability Improvement Measures:**

Beyond focusing on DTAR, banks should continue exploring other avenues for improving profitability. This includes cost reduction, exploring new revenue streams, and enhancing operational efficiency.

v. **Capital Structure Optimization**

Reevaluate the bank's capital structure to find an optimal balance between debt and equity. This involves considering the cost of capital and the risk profile of the bank's operations and asset base, aiming to minimize costs while supporting growth and profitability.

vi. **Risk Management Enhancement**

Strengthen risk management frameworks to ensure that risks associated with both assets and liabilities are well understood and managed. Effective risk management can prevent losses and support healthier financial ratios, including DTAR.

vii. **Liquidity Management:**

Maintain a strong focus on liquidity management to ensure that the bank can meet its short-term obligations without jeopardizing its asset base. Proper liquidity management can mitigate the need for distress asset sales, which could adversely affect DTAR.

viii. **Strategic Investments:**

Pursue strategic investment opportunities that not only promise good returns but also contribute positively to the bank's tangible asset base. Investments should be evaluated for their impact on both profitability and DTAR.

ix. **Monitoring and Reporting:**

Implement robust monitoring and reporting mechanisms for DTAR and related financial metrics. Regular monitoring can help in identifying trends and making informed decisions that support the bank's financial health.

x. **Stakeholder Communication:**

Maintain transparent communication with stakeholders about the bank's financial strategies, including how it manages its asset base and debt levels. Clear communication can build trust and support from investors, regulators, and customers.

Even though the negative impact of DTAR on ROA and ROE was not statistically significant, the direction of the relationships suggests that careful attention to how debt is structured relative to tangible assets could influence profitability. Banks are advised to consider these recommendations as part of a holistic approach to financial management and strategic planning.

4. Given the findings from the analysis on the Equity to Asset Ratio (EAR) and its impact on bank profitability, as indicated by its relationship with Return on Assets (ROA) and Return on Equity (ROE), where neither relationship showed statistical significance (p-values of 0.14056 for ROA and 0.399 for ROE), the following recommendations are suggested:

i. **Strengthen Equity Base:**

Banks should consider strategies to strengthen their equity base without excessively diluting existing shareholders. This could involve retaining more profits instead of distributing them as dividends or issuing new equity in a manner that optimizes the bank's capital structure and supports sustainable growth.

ii. **Asset Quality and Diversification:**

Improve asset quality through careful lending and investment practices. Diversification of assets can also reduce risk and potentially improve the return on assets (ROA), which might positively influence the EAR without necessarily compromising profitability.

iii. **Efficiency and Cost Management:**

Enhance operational efficiencies and manage costs effectively. By improving the bank's operational performance, profitability can be increased, which may positively affect both ROA and ROE, potentially leading to a healthier EAR.

iv. **Risk Management:**

Implement robust risk management strategies to mitigate financial and operational risks. Effective risk management can safeguard the bank's assets and equity, contributing to a more favorable EAR.

v. **Capital Adequacy Planning:**

Engage in thorough capital adequacy planning to ensure that the bank meets regulatory requirements without unnecessarily restricting profitability. Efficient capital allocation can enhance both EAR and bank profitability.

vi. **Monitor Leverage Levels:**

Regularly monitor and manage leverage levels to maintain a balance between using debt for growth and maintaining a healthy equity buffer. Excessive leverage can endanger the bank's financial stability and negatively affect EAR.

vii. **Strategic Investment in Growth Opportunities:**

Identify and invest in strategic growth opportunities that promise high returns. Such investments can improve ROA and ROE, contributing positively to EAR and overall bank profitability.

viii. **Performance Review and Adjustment:**

Continually review financial performance metrics, including EAR, ROA, and ROE. Use these insights to adjust business strategies and operations to address areas of weakness and capitalize on strengths.

ix. **Transparency and Communication:**

Maintain transparency in financial reporting and communicate effectively with all stakeholders about the bank's financial health, strategies for growth, and how it intends to improve or maintain a healthy EAR.

x. **Regulatory Compliance and Best Practices:**

Ensure that all strategies implemented for improving EAR and profitability are in compliance with regulatory requirements and industry best practices. Adherence to regulatory standards not only mitigates the risk of penalties but can also enhance the bank's reputation and investor confidence.

While the direct impact of EAR on profitability indicators such as ROA and ROE was not statistically significant in this analysis, the recommendations above focus on broader strategic initiatives that can influence these metrics indirectly. Banks are encouraged to adopt a holistic view of their financial management practices to support sustainable profitability and stability.

5. *Based on the findings from the analysis regarding the Debt to Asset Ratio (DAR) and its influence on bank profitability through Return on Assets (ROA) and Return on Equity (ROE), where the relationships did not reach conventional levels of statistical significance (with p-values of 0.82920 for ROA and 0.125 for ROE), the following recommendations are proposed:*

i. **Debt Management:**

Banks should carefully manage their debt levels to ensure they are using leverage effectively without compromising financial stability. Effective debt management can optimize the DAR, potentially enhancing profitability.

ii. **Asset Optimization:**

Optimize asset allocation to ensure high-yielding assets are maximized within the bank's risk tolerance. This can help improve ROA, which, although not significantly, was suggested to positively impact DAR.

iii. **Equity Enhancement Strategies:**

Consider strategies to increase equity, such as retaining earnings or raising capital, to improve the bank's financial leverage and potentially its profitability. This could indirectly influence the DAR by altering the denominator of the ratio.

iv. **Cost Control and Efficiency:**

Implement stringent cost control measures and seek efficiency improvements across operations. By lowering costs and improving operational efficiency, banks can improve their profitability, which might, over time, reflect positively in the DAR through an improved ROE.

v. **Growth and Diversification:**

Pursue growth opportunities that align with the bank's strategic objectives and risk management framework. Diversification of revenue sources can reduce volatility in earnings and improve overall profitability, potentially affecting DAR positively.

vi. **Risk Assessment and Management:**

Enhance risk management practices to identify, assess, and manage risks associated with lending, investments, and other financial activities. Effective risk management can prevent asset quality deterioration, which is crucial for maintaining a healthy DAR.

vii. **Regulatory Compliance:**

Ensure compliance with all regulatory capital requirements and leverage ratios. Adherence to regulatory standards not only prevents penalties but can also improve investor confidence and the bank's reputation.

viii. **Monitoring and Reporting:**

Regularly monitor financial ratios, including DAR, ROA, and ROE, and report these metrics transparently. This will help in identifying trends over time and making informed decisions to improve financial health and profitability.

ix. **Stakeholder Communication:**

Maintain open lines of communication with stakeholders regarding the bank's financial health, strategies, and risk management practices. Transparency can build trust and support from investors, regulators, and customers.

x. **Strategic Financial Planning:**

Engage in strategic financial planning to balance growth, risk, and profitability. Planning should consider the optimal capital structure to support business objectives while maintaining a healthy DAR.

Although the direct impact of DAR on bank profitability metrics such as ROA and ROE was not statistically significant in this analysis, the recommendations focus on broader financial management and operational strategies. By addressing these areas, banks can work towards

improving their profitability and stability, which may, in turn, positively influence their DAR over time.

For Bank Management and Policymakers

- i. **Enhance Asset Management:** Given the positive impact of DAR (Debt to Asset Ratio) on ROA (Return on Assets), banks should strive for optimal asset management practices. This includes effective credit risk assessment to ensure loans are productive and contribute positively to the bank's assets.
- ii. **Strategic Capital Structure Adjustment:** The study suggests that a carefully managed DER (Debt to Equity Ratio) could positively influence ROE (Return on Equity). Banks should consider leveraging their capital structure to enhance shareholder returns while maintaining a balance to mitigate financial distress risks.
- iii. **Focus on Efficiency and Cost Management:** The negative impact of DTAR (Deposit to Asset Ratio) on profitability metrics underscores the importance of managing operational costs and improving efficiency. Banks should adopt technology-driven solutions to streamline operations and reduce costs.
- iv. **Liquidity Management:** The mixed findings regarding LDR (Loan to Deposit Ratio) suggest that while loans are essential for revenue, excessive reliance or poor quality of loan portfolio can detract from profitability. Banks need to manage liquidity prudently, ensuring sufficient reserves to cover withdrawals without compromising on profitable loan disbursement.

For Regulators:

1. **Stability and Growth Support:** Regulators should consider policies that support bank stability and growth, such as encouraging prudent loan to deposit ratios and asset management practices. This may include guidelines or incentives for banks to diversify income sources and manage risk effectively.
2. **Enhanced Reporting and Transparency:** Improved reporting standards and transparency requirements can help in better understanding the dynamics affecting bank profitability. This may involve more detailed disclosures on loan quality, asset management practices, and capital structure decisions.

Areas for Future Research

1. **Extended Analysis Period:** Future studies should consider extending the analysis period to include more year's post-COVID-19 pandemic to understand the longer-term impacts on bank profitability.
2. **Broader Variable Set:** Including a broader set of variables, such as technological adoption, market competition, and customer satisfaction, could provide deeper insights into factors affecting bank profitability.
3. **Comparative Studies:** Comparative studies between locally owned banks and foreign-owned banks in Zambia could yield insights into different management practices and their impact on profitability.
4. **Impact of Regulatory Changes:** Examining the impact of regulatory changes on bank profitability could offer valuable insights for policymakers and bank management.

By implementing these recommendations, stakeholders can better navigate the challenges and opportunities within the Zambian banking sector, aiming for sustainable growth and profitability in the evolving economic landscape.

6.4 Implications Of The Study

Practical Implications:

Practical implications of a study reveal how its findings can be applied in real-world settings, influencing everyday practices, processes, or behaviors. For a study on bank profitability of Zambia local banks, practical implications might include:

- i. **Recommendations for Banks:** Suggestions for optimizing asset management, diversifying portfolios, or enhancing customer service to improve profitability.
- ii. **Operational Adjustments:** Identifying efficient operational strategies that minimize costs and enhance revenue. This could involve adopting new financial technologies or improving risk management practices.
- iii. **Customer Relationship Management:** Insights into how banks can better meet customer needs and expectations, potentially leading to increased customer loyalty and deposit growth.

Theoretical Implications:

Theoretical implications extend the academic and conceptual understanding of a subject. These might involve:

- i. **Extension of Financial Theories:** Proposing modifications to existing financial theories to better account for observed phenomena in bank profitability, such as the impact of digital banking services on traditional profitability models.
- ii. **New Models of Bank Performance:** Development of new or refined models that more accurately predict bank performance under various economic conditions, incorporating variables previously underestimated.

Policy Implications:

Policy implications suggest how findings could inform or influence public, corporate, or institutional policies:

- i. **Regulatory Policies:** Recommendations for regulatory bodies on maintaining the stability of the banking sector, such as capital requirements or liquidity ratios.
- ii. **Economic Policies:** Insights for policymakers on how banking sector profitability contributes to the overall economic stability and growth, guiding decisions on interest rates or investment incentives.
- iii. **Corporate Governance:** Suggestions for enhancing governance structures within banks to ensure sustainability and ethical banking practices, protecting investors and customers alike.

Methodological Implications:

Methodological implications discuss how the study's approach might influence future research methodologies:

- i. **Research Design:** Highlighting the effectiveness of the study's design in uncovering insights into bank profitability, suggesting adaptations or improvements for future research.
- ii. **Data Analysis Techniques:** Discussing the application and efficacy of statistical methods or data analysis tools used in the study, proposing their use in similar research contexts.

- iii. **Cross-disciplinary Approaches:** Encouraging the integration of methods from other disciplines (e.g., psychology for understanding customer behavior) to provide more comprehensive insights into financial performance.

6.5 Contributions of the Study

The contribution of this study which focused on bank profitability, can be multifaceted, extending across academic, practical, and policy-making realms. This study might contribute to various fields:

Academic Contribution

- i. **Enhances Understanding:** This study contributes to the academic literature by providing empirical evidence on the determinants of bank profitability, enriching our understanding of how different factors, such as regulatory changes, economic conditions, and bank-specific attributes, impact financial performance.
- ii. **Theory Development:** It offers insights that could lead to the refinement of existing theories or the development of new theoretical frameworks regarding financial performance and management in the banking sector.
- iii. **Methodological Advancements:** By employing novel data analysis techniques or addressing previously identified methodological gaps, the study could contribute to methodological advancements in the field of financial economics.

Practical Contribution

- i. **Bank Management:** For practitioners within the banking industry, the study provides actionable insights that can inform decision-making processes, risk management practices, and strategic planning to enhance profitability.
- ii. **Benchmarking:** It offers a basis for benchmarking by comparing the performance of different banks, helping institutions to identify areas of improvement and best practices.
- iii. **Innovation and Efficiency:** By identifying the key drivers of profitability, the study encourages banks to innovate and improve operational efficiency, potentially leading to the development of new financial products or services.

Policy Contribution:

- i. **Regulatory Frameworks:** The findings can inform policymakers about the impact of current regulatory frameworks on bank profitability, aiding in the design of more effective banking regulations that ensure financial stability without stifling growth.
- ii. **Economic Policy:** Insights from the study can help in shaping economic policies that aim to enhance the health and competitiveness of the banking sector, which is pivotal for economic growth and stability.
- iii. **Financial Inclusion:** By understanding the factors that contribute to bank profitability, policymakers can also devise strategies that promote financial inclusion, ensuring that banking services are accessible and affordable to a broader segment of the population.

Methodological Contribution:

- i. **Advanced Analytical Techniques:** If the study introduces advanced analytical techniques or novel approaches to model estimation, it can set a precedent for future research, encouraging more sophisticated analyses in banking and finance research.
- ii. **Cross-disciplinary Approaches:** The study might integrate perspectives from economics, finance, and information technology, among others, contributing to a more interdisciplinary understanding of bank profitability.

By addressing these areas, the study not only contributes to academic knowledge but also has the potential to influence banking practices, policy-making, and methodological approaches in the research community. These contributions underscore the importance of comprehensive research in understanding and enhancing the financial performance of banks, which play a crucial role in global and local economies.

6.6 Thesis

This study aimed to explore the determinants of bank profitability for **Zambian Owned Banks**, focusing on a multi-dimensional analysis that includes bank-specific factors, macroeconomic indicators, regulatory impacts, and global economic trends. The thesis posits that while internal factors such as capital adequacy and asset quality play critical roles in determining profitability.

The Central thesis is as follows;

“DER, LDR and DTAR have negative Impact on Profitability while EAR and DAR have positive Impact of Profitability”

6.7 Limitations of the Study:

Addressing the limitations of a study is crucial for providing a balanced and honest assessment of its findings. Below are explanations of the types of limitations of this study on determinants of bank profitability for locally owned banks;

Methodological Limitation:

Methodological limitations refer to potential weaknesses or constraints in the study's design, data collection, or analysis methods that might impact the reliability or validity of the findings.

The methodological limitation of this study was that it primarily relied on quantitative data from financial reports, which may not fully capture the nuanced factors affecting bank profitability, such as customer satisfaction or employee performance. Additionally, the cross-sectional nature of the data limits the ability to draw conclusions about causality between variables.

Theoretical Limitation

Theoretical limitations involve constraints related to the conceptual framework or theories underpinning the study, potentially affecting the interpretation and generalizability of the results.

The study's theoretical framework was based on traditional models of bank profitability, which may not fully account for the impact of digital banking technologies and the changing regulatory landscape on banks' financial performance.

Model Specification Limitation

This type of limitation concerns potential errors in how the study's analytical model was constructed, including the selection of variables and their assumed relationships.

The model may have omitted important variables that influence bank profitability, such as international economic conditions or the level of digital adoption among customers, potentially leading to biased or incomplete findings.

Model Estimation Limitation

Model estimation limitations refer to issues related to the techniques used to estimate the relationships between variables in the model, which can affect the accuracy of the results.

The study used linear regression analysis, which assumes a linear relationship between independent and dependent variables. This may not accurately capture the complex, non-linear interactions that exist in the real world, such as the effect of market saturation on profitability.

Practical Limitation:

Practical or practice limitations involve constraints that limit the applicability or utility of the study's findings in real-world settings.

The findings were based on data from a select group of banks within a specific geographic region, limiting their applicability to other contexts. Furthermore, the rapidly evolving nature of the banking industry means that the study's findings may become quickly outdated, reducing their practical value for future policy or management decisions.

Acknowledging these limitations not only enhances the credibility of the research but also provides valuable insights for future studies, encouraging ongoing inquiry and exploration into the complex dynamics of bank profitability.

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APPENDICES

Appendix 1: Time Series Panel Data Used in Data Analysis/Econometric Analysis (Secondary Data)

Banks	Year	Assets	Debt	Equity	Loans	Deposits	Net profit after Tax
FAB	2014	464,957,000.00	32,744,000.00	137,517,000.00	238,465,000.00	262,946,000.00	11,638,000.00
FAB	2015	693,354,000.00	549,399,000.00	143,955,000.00	371,553,000.00	442,696,000.00	6,438,000.00
FAB	2016	678,076,000.00	508,215,000.00	169,861,000.00	368,568,000.00	483,174,000.00	25,906,000.00
FAB	2017	751,660,000.00	561,178,000.00	190,482,000.00	354,647,000.00	531,353,000.00	19,150,000.00
FAB	2018	919,144,000.00	701,078,000.00	218,066,000.00	407,202,000.00	614,106,000.00	43,464,000.00
FAB	2019	940,577,000.00	706,218,000.00	234,359,000.00	415,034,000.00	657,982,000.00	14,826,000.00
FAB	2020	7,318,255,000.00	1,065,684,000.00	252,571,000.00	531,654,000.00	974,928,000.00	20,739,000.00
FAB	2021	145,503,000.00	1,201,145,000.00	253,885,000.00	447,577,000.00	1,083,859,000.00	9,363,000.00
Indo	2014	2,382,269,120.00	1,798,647,945.00	583,621,175.00	799,000,000.00	1,645,000,000.00	46,000,000.00
Indo	2015	2,797,281,380.00	2,148,531,384.00	648,749,996.00	987,000,000.00	1,993,000,000.00	81,000,000.00
Indo	2016	2,948,463,330.00	2,248,461,830.00	700,384,550.00	1,012,592,884.00	2,067,870,636.00	53,606,523.00
Indo	2017	3,612,040,820.00	2,835,860,255.00	776,180,565.00	1,255,716,151.00	2,603,013,122.00	108,918,094.00
Indo	2018	4,441,154,132.00	3,568,050,550.00	873,103,582.00	1,710,012,172.00	3,305,477,096.00	139,760,628.00
Indo	2019	5,796,269,877.00	4,804,522,589.00	991,747,288.00	2,166,074,860.00	4,506,578,010.00	178,412,372.00
Indo	2020	10,016,138,447.00	8,871,573,809.00	1,144,564,638.00	2,696,609,165.00	6,570,772,409.00	209,719,441.00
Indo	2021	10,960,471,638.00	9,611,242,723.00	1,349,228,915.00	3,001,238,625.00	7,802,543,931.00	278,573,936.00
Zanaco	2014	6,663,803,000.00	5,662,897,000.00	1,001,106,000.00	3,138,506,000.00	5,053,720,000.00	142,926,000.00
Zanaco	2015	7,945,772,000.00	6,905,488,000.00	1,040,284,000.00	3,446,554,000.00	6,033,084,000.00	117,509,000.00
Zanaco	2016	8,001,804,000.00	7,130,864,000.00	1,024,052,000.00	3,187,597,000.00	6,256,182,000.00	(61,802,000.00)
Zanaco	2017	9,543,088,000.00	8,519,036,000.00	1,024,052,000.00	3,223,173,000.00	7,454,624,000.00	114,159,000.00

Zanaco	2018	10,614,067,000.00	9,793,159,000.00	820,908,000.00	4,207,022,000.00	8,899,546,000.00	183,733,000.00
Zanaco	2019	11,895,966,000.00	10,955,087,000.00	940,879,000.00	4,819,676,000.00	9,848,095,000.00	214,654,000.00
Zanaco	2020	19,377,363,000.00	18,163,116,000.00	1,214,247,000.00	48,284,000.00	15,712,069,000.00	234,508,000.00
Zanaco	2021	26,183,932,000.00	24,038,295,000.00	2,145,638,000.00	13,740,000.00	19,329,279,000.00	1,039,820,000.00

Table 27: Source - Banks Annual Audited Financials

