

**THE EFFECTS OF LIQUIDITY AND SOLVENCY ON SOUTH
AFRICAN BANKS' PERFORMANCE**

By

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ABSTRACT

This study examined the effects of liquidity and solvency on South African banks' performance. The panel regression approach was used, applying panel data from 13 commercial banks over the period 2012 to 2022. The pooled ordinary least squares regression, fixed effects, random effects, and generalised methods of moments were used in the liquidity ratio, solvency ratio and bank performance regression analysis. However, the strategy using system-generalised methods of moments was chosen above the others since it resolved the endogeneity issue.

The relationship between liquidity, leverage and bank performance was investigated due to fewer research made in the South African context especially the banking sector. Moreover, South African Banking sectors has gone through some interesting developments post-Apartheid era. Thus, the research's main objective is to build on past research on the South African banking context for a relationship between liquidity, leverage, and bank performance. There were contradictions on the relationship between liquidity and leverage and performance. Moreover, rarely was this phenomenon empirically tested in South African banks. Theory and a significant portion of empirical studies suggest a negative relationship between solvency and performance. While on the other hand theory postulates both negative and positive relationship between liquidity and bank performance.

The study had three objectives. The first being an examination of the relationship between liquidity coverage ratio and bank performance in South Africa. The second being to investigate the relationship between the net stable funding ratio and bank performance in South Africa. And the last being to examine the relationship between leverage and bank performance in South Africa.

The empirical findings indicate that the bank independent variables (liquidity and leverage) have diverse effects on bank performance, with liquidity having a negative impact. Leverage, on the other hand, had both positive and negative impacts on bank profitability. The results imply that leverage can be a double-edged sword that managers should carefully monitor as it is dependent on what you want to achieve. Also, though

liquidity is a cost as it negatively affects performance it can equally enhance performance if the banks can optimise its management by taking advantage of ad hoc profitable projects. Future studies should investigate the impact of a pandemic like COVID-19 and digital disruptions on bank performance.

Keywords: solvency, non-performing loans, debt-to-equity ratio, liquidity coverage ratio, net stable funding ratio, bank performance.

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It was challenging to spend time studying without socializing; therefore, I also want to thank my family and friends for their support throughout this study. I dedicate my research study to the Almighty Father in heaven, who has been a source of strength, guidance, and hope for me during this process.

DECLARATION

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THE EFFECTS OF LIQUIDITY AND SOLVENCY ON SOUTH AFRICAN BANKS' PERFORMANCE

I declare that the above dissertation is my work and that all the sources that I have used or quoted have been indicated and acknowledged employing complete references. I additionally declare that I have not previously submitted this work, in whole or in part, for examination at UNISA to obtain a different qualification or at any other higher education institution. Furthermore, I declare that the dissertation has been tested for originality using software and that it meets all accepted requirements.

NL Kumalo

6/03/2023

SIGNATURE

DATE

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LIST OF ABBREVIATIONS

CAR- Capital adequacy ratio

CR - Current ratio

DE - Debt/ Equity ratio

ER - Exchange rate

GFC - Global Financial Crisis

INF - Inflation

IR - Interest rate

LCR – Liquidity coverage ratio

LDR - Loan-to-Deposit Ratio

LTDR - Long-term debt-to-asset ratio

NIM - Net interest margin

NPL - Non-performing loans

NSFR - Net stable funding ratio

ROA – Return on assets

ROE – Return on equity

SARB - South African reserve bank

STDR - Short-term debt-to-asset ratio

TDR - Total debt to asset ratio

CHAPTER 1

1.1 BACKGROUND

Intermediaries in the financial sector play a vital role in economic activity performance; hence the performance is affected by internal and external factors. The bank's performance is affected by micro and macro factors. The regular supervision of the organisation's short-term assets and liabilities performs a critical part contributing to the firm's success. If a company is unconcerned about its own success, In the long run, it won't survive, whereas on the other hand, in case it does not care about liquidity, it may confront the issue of bankruptcy or liquidation. For these reasons, liquidity administration should be given proper consideration and will eventually influence the profitability of the firm. During the global financial crisis of 2007, liquidity and solvency became key factors in the smooth functioning of commercial banks' financial framework. Liquidity and solvency are used to measure the paying ability of business organisations. Awulo et al., (2019) state that adequate financial intermediation requires purposeful attention from bank management to profitability and liquidity which are two clashing objectives of commercial banks. These objectives are parallel in the sense that an attempt to realise higher profit will certainly dissolve its liquidity and solvency position and vice versa.

Munangi and Sibindi (2020) assert that credit is a highly ranked part of the financial soundness of banks. When the economy performs ineffectively, it may lead to bank disappointment in terms of liquidity hazard and might lead consumers to be over in debt. Banks could be challenged with liquidity risk when there is a lot of withdrawal in deposits; hence profitability and solvency might be affected. This study's goal was to better understand how liquidity and solvency affect the profitability of South African banks within this scenario. At the same time, there is an increase in unemployment. Munangi and Sibindi (2020) point out that in emerging nations, high levels of unemployment make it difficult to pay off loans. Credit default may occur due to low income, business failure or unwilling to meet obligations despite having sufficient income.

Using this part of my investigation, researcher want to determine whether liquidity will be affected by credit risk.

Numerous authors such as Charmier et al., (2018); Marozva (2015, 2017, 2019, 2020; 2022); Moussa (2015); Munangi and Sibindi (2020); and Luvuno (2018) have researched the liquidity performance of commercial banks, liquidity risk, Factors affecting banks' profitability that are related to liquidity and credit risk. Charmier et al., (2018) and Moussa (2015) studies acknowledged a negative relationship between liquidity and profitability. Marozva (2017) established a mismatch of the liquidity risk on the assets and liability of a bank. On the other hand, Luvuno (2018) spotted diverse results of bank liquidity, and the mutual outcome was based on internal bank factors, size of the bank, loan growth, and non-performing loans and macroeconomic factors such as inflation rate and GDP growth. Munangi and Sibindi (2020) analysed the impact of credit risk on the financial performance of South African banks and negative correlation was the outcome. There are constraints on banks in the achievement of liquidity and profitability goals and for this reason, a bank needs to maintain adequate liquidity to meet unforeseen and seasonal loan demands.

A bank needs capital to lend, otherwise it risks becoming insolvent. According to Ali and Puah (2018), a profitability model indicates that the bank's credit risk has a statistically significant impact on profitability, while liquidity risk shows a statistically insignificant effect on profitability. Higher liquidity decreases bank profitability (Curak et al., 2012). Liquidity is one of the factors that affect bank profitability and harms profits (Winoto & Bustaman, 2020). Lack of economic performance leaves consumers deeply in debt-ridden or unable to pay, resulting in the failure of a bank, as lending is a huge factor concerning the financial soundness of banks (Munangi & Sibindi, 2020). Banks will possibly look at their liquidity barriers becoming pressed for time. This might lead to some problematic balance-sheet findings on how liquidity will be utilized to finance revolving credit line renewals plus new credit extensions.

In general, the banking industry is considered solvent when the total assets are more

significant than the total liabilities. Muthoni (2015) points out that measures of solvency comprise total debt-to-total capital, total debt-to-equity capital, long-term debt-to-equity capital and short-term debt-to-equity ratios. Solvency is one of the bank-specific factors that influence the performance of a bank and is used to measure a bank's ability to meet its debt obligation. One of the key financial ratios that are used to measure the solvency of a bank is the ratio of debt to equity. The ratio indicates the degree of financial leverage being used by the bank and includes both short-term and long-term debt. The lower the ratio, the greater the chance that the bank will default.

1.2 DEVELOPMENT OF GLOBAL BANKS' PERFORMANCE

In general, economic, social, and political globalisation may have an impact on bank performance, either positive or negative. The results of Sufian and Kamarudin (2016) study on the impact of globalisation on the performance of banks in South Africa revealed that banks located in countries with greater economic globalisation tend to perform better, while banks located in countries with greater social and political globalisation tend to be less profitable. Erasmus and Makina (2014) discovered that the global financial crisis of 2008 to 2009 did not affect the efficiency of most South African banks. The banking system in South Africa is strong and resilient, with adequate capital levels and significant liquidity buffers (SARB, 2022).

Sutrisno et al., (2020) investigated the effect of the COVID-19 pandemic on the performance of Islamic banks in Indonesia. Profit was shown to have a considerable influence when measured by return on equity and net operating margin. Fauzi et al., (2022) study based on the profitability of Indonesia's publicly listed banks on bank-specific and macroeconomic factors explores the issues which might impact the profitability of Indonesian banks between January 2019 and December 2021. In this period, Indonesian banks faced a decline in financial performance.

1.3 DEVELOPMENT OF SOUTH AFRICAN BANKS' PERFORMANCE

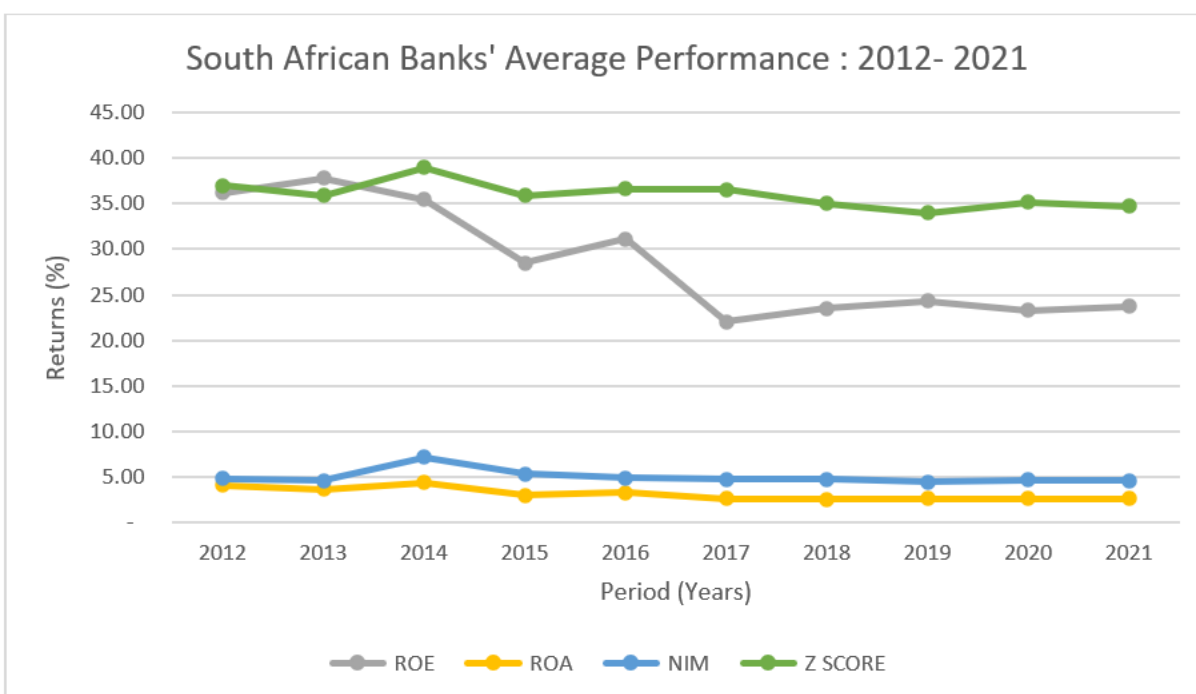


Figure 1.1 South African banks average performance

The performance of South African banks in terms of ROA and NIM remains stable, but positive. While there is a downward slope with Z-Score and ROE, although bank performance still remains positive. Bank performance is significantly affected by business cycles, despite more optimal economic conditions, SA's big banks achieve solid financial results (PWC, 2022). According to PWC (2022), when 2021's financial year came to an end, combined headline earnings of R86.8 billion improved by 99% over FY20, with a combined ROE of 15.9% (FY20: 8.3%), net interest margin of 408 bps (FY20: 387 bps), a credit loss ratio of 74 bps (FY20: 180 bps), and a cost-to-income ratio of 55.8% (FY20: 56.4%).

Financial institutions strive to maximise profitability through the services they provide to their clients. Bank internal, or macro-specific factors, are the basis of bank performance (Marozva, 2015; Marozva & Makoni, 2021; Magwedere & Marozva, 2022; Machokoto & Marozva, 2022). Kana (2017) considered ROA as a determinant of bank profitability in South African banks and mixed results were found. Based on the study, bank-specific

factors and industry-specific factors (market concentration) have a positive correlation with bank profitability, while non-significant variables negatively affect bank performance. Using the top 40 Johannesburg Stock Exchange (JSE) firms as a sample, Matsoma (2022) examined liquidity risk, financial leverage, and firm financial performance. An indirect correlation was found between liquidity risk and ROE and ROA.

Furthermore, Nyoka (2017) analysed South African commercial banks' capital and profitability. This study's findings backed up the notion indicated the existence of a positive and statistically significant relationship with both bank capital and profitability. Additionally, Letsoalo (2021) researched the profitability structure phenomenon using evidence from the South African banking industry, and the findings show a positive relationship between microeconomic variables and bank performance.

1.4 BANK LIQUIDITY TRENDS IN SOUTH AFRICA

Due to increasing perceived financial market risks a rise in the demand for short-term call deposits was observed during the COVID-19 crisis of March 2020, thus, the LCR experienced an increase in short-term cash outflows. The LCR ratio then decreased to about 125%. Banks were compelled to increase their HQLA as a result of ratings of the sovereign credit of South Africa downgrading towards the end of March 2020 (Diesel et al., 2022).

The research by Marozva (2017) produced contradicting findings, showing that banks with a higher liquidity mismatch will have lower performance, and banks with a higher return will also have a higher liquidity mismatch. However, Luvuno (2018) identified significant factors affecting South African commercial bank liquidity. There was a positive relationship between capital adequacy, size, and GDP, while a negative correlation was noted between loan growth, nonperformers, and liquidity. Lastly, inflation impacts liquidity both negatively and positively. According to the SARB (2022) liquidity stress test, South African banks have enough liquidity resources to weather extreme liquidity shocks.

With respect to the time frame into consideration, Figure 1.2 illustrates that South African bank's cumulative liquid rates climbed slightly in 2019 and decreased in 2020 and 2021.

Due to the negative consequences of the covid-19 pandemic crises, South Africa experienced a decline in banks' liquid asset holdings in 2019. The Prudential Authority (PA) reduced the LCR requirement from 100% to 80% as part of its response to the potential negative impact of Covid-19 on liquidity in financial markets (SARB, 2021).

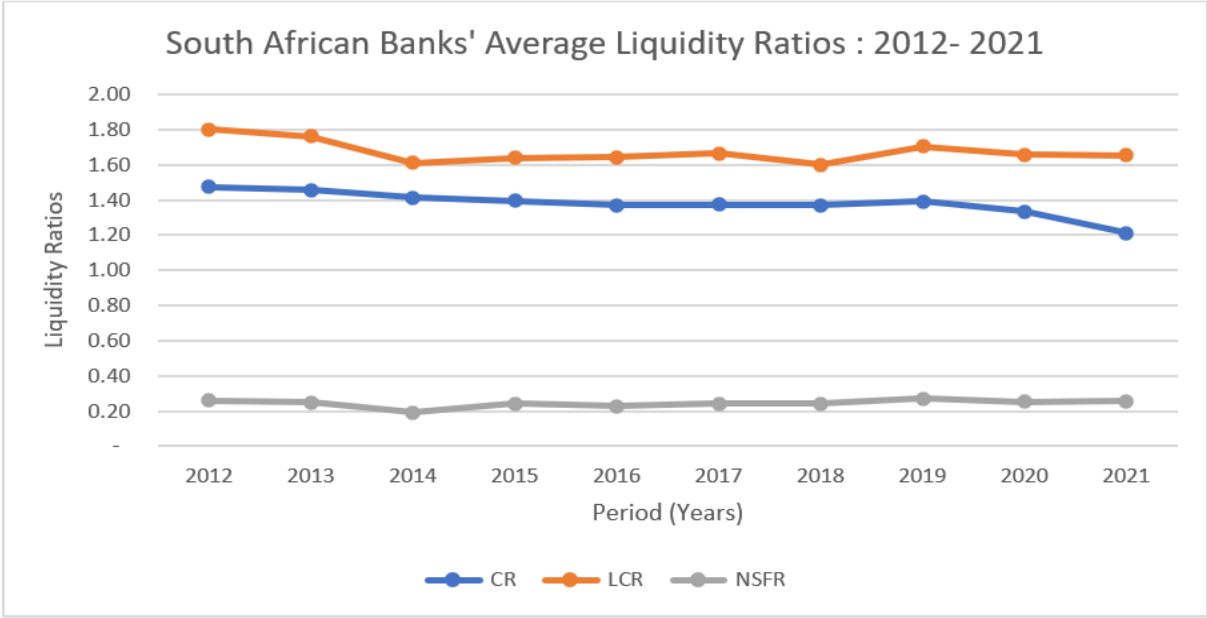


Figure 1.2 South African banks average liquidity ratio.

1.5 BANK LEVERAGE TRENDS IN SOUTH AFRICA

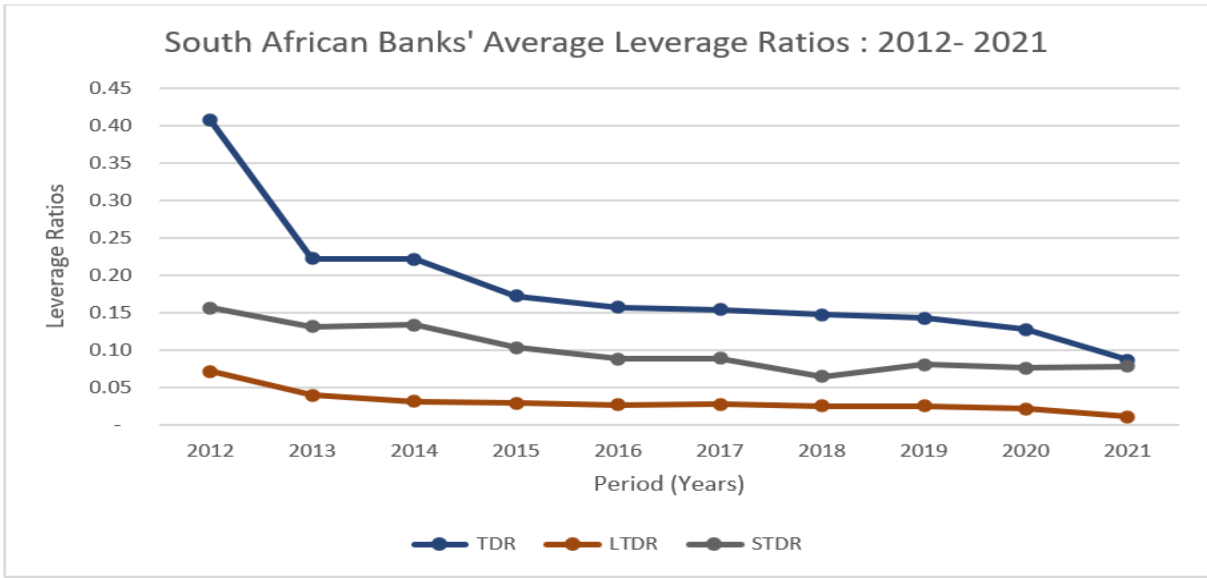


Figure 1.3 South African banks' leverage ratio

During the solvency stress test conducted by the (SARB, 2022), the outcomes indicated that S.A banks are adequately capitalized and capable of withstand protracted economic disruptions. Figure 1.3 shows that leverage ratios have declined from 2012 to 2021, which means TDR has dropped from 0.40 to less than 0.10. In comparison, STDR has decreased from 0.15 to less than 0.10. As an additional LTDR ratio, it was above 0.05 in 2012, and it dropped slightly to be above 0.00 ratio in 2021. Munangi (2020) carried out a study of credit risk on the financial performance of South African banks. According to a research's findings, credit risk is negatively associated with financial performance. Thus, the higher the incidence of non-performing loans, the lower the bank's profitability. Furthermore, the study found a disadvantage correlation among financial institution leverage and monetary performance. Matsoma (2022) examined liquidity risk, financial leverage, and firm financial performance on a sample of 40 JSE firms. In terms of ROA and ROE, the results of DE and TDR indicated negative effects of financial leverage on firm performance.

According to Khoza's (2020) research into the link between the bank's profitability and South African governmental obligations, capital adequacy has both a positive and a negative impact on bank effectiveness, while the performance of banks is adversely and significantly impacted by non-performing loans. Based on Modigliani and Miller (1963) theory, financial solvency had a favourable effect on a bank success which contradicts the negative results.

1.6 PROBLEM STATEMENT

The conclusion of a researchers on the bank's solvency and liquidity has significant effects on the profitability of banks; hence there is a different view depending on the measures used to conduct the research. Marozva (2012) conducted a study of asset liquidity and bank profitability in South Africa and discovered a negative connection between liquidity along with profitability. Except for Khan and Ali (2016), where liquidity was positively associated with profitability, different results were established. Dahiyat (2016) explored a study based on the liquidity and solvency impact of banks' profitability

in Jordan and concluded that there was no relationship between liquidity and profitability and no impact on solvency and profitability. However, an investigation done by Muthoni (2015) on the effect of liquidity and solvency on the profitability of commercial banks in Kenya harmed profitability. Solvency has a positive effect on ROA and a negative impact on ROE (Nguyen & Nguyen, 2020). According to Marbun and Malan (2020), liquidity and solvency have a positive and strong relationship with profitability and when liquidity increases profitability also increases. In comparison, Khidmat and Rehman (2014) implies the relationship between solvency and profitability is inverse.

A few authors have investigated the impact of liquidity and solvency on South African banks' profitability in the South African context, such as Marozva (2017), and Mishi and Khumalo (2019) who investigated bank stability in South Africa. Within the South African context, Marozva (2015) analysed the relationship between liquidity and bank performance and found a short-run relationship between liquidity and bank performance. However, Marozva (2015) did not discover evidence supporting a long-run relationship between liquidity and banks' performance.

Molefe and Muzindutsi (2016) researched the effect of capital and liquidity management on major South African banks' profitability banks and resulted in no significant relationship between liquidity indicators and profitability in the leading South African banks. Molefe and Muzindutsi (2016) further suggest South African banks should reconsider their liquidity management in order to develop the optimal liquidity necessary to boost profitability. Therefore, this study's major goal will be towards investigating the effects of liquidity and solvency on South African banks' performance since there is insufficient research done on the liquidity, solvency and profitability of South African banks.

1.7 OBJECTIVES

- To examine the relationship liquidity coverage ratio and bank performance in South Africa.
- To investigate the relationship between the net stable funding ratio and bank performance in South Africa.
- To examine the relationship between leverage and bank performance in South Africa.

1.8 SIGNIFICANCE OF THE STUDY

This study investigated the performance of South African banks based on liquidity and solvency. Statistical data were collected from the South African Reserve Bank. Following the Banks Act 94 of 1990, the study focused on locally registered and licensed banks in South Africa. The research was quantitative and used panel data regression analysis. A detailed description is provided in Chapter 3. Numerous worldwide studies have examined how liquidity and leverage affect financial performance, but research of this nature in the African context, especially that conducted in South Africa, is very limited. The study examines controllable factors for South African banks or ways of managing them better to ensure leverage and liquidity requirements are effectively met. This study will also allow other researchers to conduct additional research in the sector.

1.9 LIMITATIONS OF THE STUDY

The study is limited to South African banks registered locally which spans the years 2012 until 2022. A lack of studies focusing on leverage, liquidity, and bank performance in South Africa led the researcher to refer to theoretical and empirical studies from other countries. Due to the challenges in acquiring financial statements for these banks, a small group of participants was excluded from the research. Since most of the excluded banks had low asset bases, including them might have revealed some vital information about liquidity and leverage. Discovering how small banks responded both before and during the COVID-19 pandemic crisis would be informative.

1.10 ETHICAL CONSIDERATIONS

The MFI has been criticised for their moral practices – scholars refer to these practices as an “ethical crisis” which is associated with high interest. In Mexico, the MFI has charged excess interest rates of up to 100% and has used harmful loan recovery practices to recover loans from the poor. These MFIs have also had political influences, where the government have set the price ceiling to exploit the poor (Marek & Sandberg, 2013). Mahmood (2013) writes that the biggest concern with MFIs' ethical practices is exploiting the poor by charging high interest rates and using forceful loan recovery rates to make a profit. Scholars have questioned the industry by asking these questions:

1. Is it ethical to conduct business with the poor to earn a profit?
2. What practices can be implemented to ensure that the poor remain unharmed?

Another concern is what is the correct amount to charge the poor. When banks charge high interest rates it causes the poor to be over-indebted and this makes them rely on these loans, defeating the purpose of poverty alleviation (Dhilion, 2014).

There is also the behavioural issue which involves the pressure that creditors put on the poor to get their instalments, and such pressure causes the borrowers to carry the burden of debt. Another ethical issue is the morality of the organisation and the policies and structures of MFI. Their policies are structured in such a way that they encourage high-risk individuals to take out loans so that they can charge higher interest rates (Mukhopadhyay & Barpanda, 2012).

In the researchers' opinion, the solution to solve these ethical issues is for the MFI to restructure their policies by not issuing loans to high-risk individuals, who will not be able to pay the loans, as this will decrease the burden that these individuals carry. In addition, the MFI can charge lower interest rates or charge interest rates according to the risk pool of the poor; this will ensure that they are still making a profit but also lessen the burden of the poor and still achieve their main purpose of eradicating poverty.

1.11 STRUCTURES OF THE RESEARCH

This research is divided into six sections and is organized as follows:

Chapter 1 outlines a general orientation of the paper, which comprises the introduction with relation to the research, theoretical background, problem assertion plus overview of the methodology. It explains a purpose of the study and the type of study that will be conducted, and the overall thesis is summarised in this chapter.

Chapter 2 provides a detailed theoretical framework of the study. This chapter discusses a great portion of theories of profitability and how different variables influence profit.

Chapter 3 the chapter includes empirical studies on liquidity, solvency, and bank performance, as well as a detailed summary of observations and findings from various studies.

Chapter 4 consists of a detailed description of the methodology that is conducted in this study. It includes the research approach, type of research, research design, sampling, data collection and data analysis.

Chapter 5 discusses research findings, and they are presented in the form of tables.

Chapter 6 explains the overall summary of the research, formulates conclusions, provides recommendations for future research and addresses whether the objectives and the goals have been achieved.

1.12 CONCLUSIONS

The research investigated the effects of liquidity and leverage on South African firm performance. Based on the finding of the researchers, it is concluded that profitability is significantly impacted negatively by liquidity, although these results differ based on the different variables used. Alshanti (2015) utilized ROE and ROA metrics, along with the effect of quick ratio on profitability, which contains a positive effect when measured by ROE, though when measuring both (ROE and ROA), the result became negative. Additionally, this research concluded that solvency has no discernible influence on profitability and considering previous research, the findings are inconclusive. Marbun and Malan (2020) point out that there is a positive relationship between solvency and profitability, hence Nawaz et al., (2015) investigation on variables between financial

leverage measured by debt to total assets and profitability resulted in an inverse relationship utilising ROA as the measure for profitability.

CHAPTER 2: THEORETICAL LITERATURE REVIEW

2. INTRODUCTION

This chapter provides a brief overview of banking theories in general, with a focus on market power theory. According to market power theory, certain market strengths are required for a business to achieve good financial success (Khoza, 2020). Ryan et al., (2014) state that market powers exist in the case of entry barriers to specific markets and capital requirements can be a barrier. Digital innovation has reduced cost barriers, allowing new and smaller players to enter. The elimination of many fixed costs, as well as a reduction in variable and switching costs, allows low-cost providers to enter the market (Feyen et al., 2021). According to Keeley (1990), in the banking sector, market power undermines financial stability, whereas Leon (2015) state that market power is most likely to harm banks according to the concept underlying banking sector competition.

Financial service has a crucial influence on the economy. Traditional theories of intermediation are based on transaction costs and asymmetric information. They are intended to represent foundations which take stores or issue protection strategies and channel assets to firms. Scholtens and Van Wensveen (2003) state that intermediaries can be used to scale back on transaction costs and information gaps; while Meon and Well (2010) assert that financial intermediaries are important for improving resource allocation and for promoting technological innovation since information costs are reduced. Scholltens and Van Wensveen (2000) argue that financial intermediation theory is overly focused on functions of financial institutions that are no longer necessary in mature financial systems. They further state that the emphasis on the role of intermediaries in reducing the frictions of transaction costs and asymmetric information is exaggerated; while these factors were once central to the role of intermediaries, they are becoming less important with the improvements in information technology, liberation, and the deepening of financial markets.

The capital structure is considered to be an essential structure for an organisation in the business cycle. A capital structure theory describes the source of the money supply and the method that must be employed to obtain this resource either acquiring a firm's assets

or investing in initiatives. Traditional Trade-off Theory and Pecking order theory are the most satisfactory speculations of capital structure (Mostafa & Boregowda, 2014). A sound capital structure of an organisation helps to raise the firm's value, utilisation of available funds, minimisation of cost of capital and management of the solvency or liquidity position (Alebachew, 2020). Myers and Majluf (1984) developed the famous solvency management theory which suggests a negative relationship between solvency and performance. Sumani and Roziq (2020) discovered that capital structure (debts-to-assets ratio and debt-to-equity ratio) has a significant negative impact on corporate performance.

The liquidity preference or demand for money is the most essential and critical major macroeconomic variable in determining economic and financial sector improvement in any nation (Tan, 1997). Friedman (1956) expresses money demand as a function of income and the cost of holding money. The money demand refers to the aggregate form representing the total demand for money by the public in a spendable structure. Tobin's approach eliminates the limitation of Keynes's theory of liquidity preference for speculative motive, which is that individuals hold their wealth in either all money or all bonds (Tobin, 1956). According to Sayedi (2013), the importance of bank profitability is possible seen at the microeconomic and macroeconomic levels. This study's emphasis will be on the factors that influence banking results theories at the microeconomics and macroeconomic level.

The rest of the Theoretical Chapter is organised as follows: Section 2 provides definitions of key concepts which include: bank performance, liquidity, and leverage. Section 3 presents, critiques and discusses the key theories that explain a bank's performance. Theories including financial intermediary theory, market power theory, money demand analysis and liquidity preference analysis are briefly discussed as they are not the focus of this study. The liquidity theory and capital structure theory are comprehensively discussed as these are empirically tested in this research. Section 4 contains the summary and conclusion of this chapter.

2.1 DEFINITION OF KEY TERMS

The performance of a bank is heavily reliant on liquidity and leverage. Marozva (2015) states that the opportunity cost of holding liquid assets is higher returns. Myers and Majluf (1984) developed the well-known solvency management concept, that proposes an adverse correlation with solvency and bank effectiveness. The analysis of bank performance, liquidity and leverage will be the prime motive of this study.

2.1.1 Bank performance

Kana (2017) and Rengasamy (2012) stated that bank performance reflects how a bank's resources are used in a way that allows it to achieve its objectives. Alternatively, it refers to the use of a collection of indicators to assess a bank's current state and its potential to accomplish desired goals to maintain stability and sustainability. Bank performance, according to Anouze and Bo-Hamad (2019), is a strategy of ensuring that resources are readily available for the most efficient and effective utilization, to maximize a return on the capital invested by the company.

Different scholars interpret bank performance indicators differently, and there is no basic measure. Some academics measure performance using profitability, while others use net interest margin (NIM), return on assets (ROA), return on equity (ROE), liquidity, the balanced scorecard, financial matrices, the perspective of customers, or internal and external processes (Khoza, 2020). Dahiyat et al. (2021) exhibited a considerable detrimental effect on performance as assessed by return on assets (ROA) and profits per share in addition to solvency as evaluated by the total liabilities to total assets ratio (EPS). Marozva (2015) used net interest margin as a metric for measuring bank performance. NIM, ROA and ROE will be used to measure bank performance in this study.

2.1.2 Liquidity

According to Vodova (2016), liquidity refers to a bank's capacity to meet its obligations at any moment, such as returning consumer funds or completing a transaction on the client's behalf, while Mugenyah (2015) states that according to the BIS (2008), liquidity is defined as a capability to accumulate adequate resources to cover liabilities commitments on time

or without going bankrupt. Liquidity is defined as the ability to transform assets or securities into cash quickly (Moussa & Boubaker, 2020). Liquidity can be defined in terms of the ease with which a security may be swapped as well as how easily financing could be acquired to trade an asset, which was previously known as market liquidity and finally as funding liquidity (Marozva, 2015). Marozva (2015) measures liquidity using FLR-funding liquidity risk and market liquidity risk (MLR), while Dahiyat et al. (2021) measured liquidity using the current ratio. Ehiedu (2014) found that profitability and liquidity, as evidenced by the current ratio, have a substantial positive association. In this study, liquidity is the ability to pay short-term liabilities. The ratio of liquidity used in this research is the current ratio. According to Dahiyat (2016), liquidity has a significant negative impact on profitability, while Sumani and Roziq (2020) state that the performance is unaffected significantly by the liquidity policy (cash ratio, cash holding, liquid assets).

2.1.3 Leverage

According to Abubakar (2015), financial leverage is a measure of how much a company employs both equity and debt to fund its assets. The capacity of an organization to compensate or satisfy its commitments with its capital is referred to as leverage (Setyabudi, 2021). According to Markonah et al. (2020), leverage represents a company's ability to fulfil all of its obligations, both short-term and long-term. Solvency or leverage is measured using total debts to total assets (Dahiyat et al., 2021). Markonah et al., (2020) measured leverage using the debt-to-equity ratio (DER). According to A study, leverage is a measurement of how much of the assets of a firm are funded by debt and the total debt-to-equity ratio will be used to measure leverage. Dalci (2018) researched Chinese manufacturing companies and came to the conclusion that leverage has a "inverted U-shaped" effect on profitability, meaning it may have both a good and a negative influence. Compared to Ali (2020) who found that financial leverage had no bearing on profitability as measured by ROA, Ali and Faisal (2020) found that solvency was one of the most significant financial performance factors

2.2 THEORIES OF BANK PERFORMANCE

The section that follows discusses bank performance theories that can help management

make the best decisions about their bank's financing. According to Ariss (2010), increased market power results in increased bank stability and profit efficiency, while Makhaya and Nhundu (2016) state that the retail banking sector in South Africa has high entry barriers and Capitec has been a successful new entrant into the local market.

2.2.1 Market power

Market power is the capacity to profitably set prices above competitive levels for a considerable period. The degree of competition in the banking sector is controlled by a bank's market power. As economies of scale make it difficult for medium-sized enterprises to compete in the market, this is how market power in South African retail banking has been described. Banks keep away from price competition yet contend with other dimensions such as expenses associated with changing that customer incurred while switching banks (Makhaya & Nhundu, 2016). According to Leon (2016), cross-border banking allows major pan-African banks to charge higher loan rates and lower deposit rates in their host nations, resulting in increased bank market dominance in Africa.

It is demonstrated that banks with market power can change deposit or lending rates without losing profits or customers in order to achieve their strategic goals (Idun et al., 2020). Moradi et al., (2016) estimated the market power of the Iranian banking industry in a parametric methodology and the results showed that the monopoly power of the banking industry in the loan market was declining and the competitive conditions were improved, additionally indicating there is a gap between the price and the marginal cost at a high level. According to Jacobson (1988), market power theory is when a firm can increase prices or produce inferior products because its rivals are unable to provide a better alternative.

Competition Commission (2021) banks in South Africa operate as oligopolists that maximise their profits by avoiding outright price competition where they can although competing for customers in other ways, and by taking advantage of the degree to which customers, once recruited, become secured to a specific bank. The cost and switching banks weaken the competitive effect of price differences where those can be recognised by customers and allows supra-competitive pricing to be kept up with.

Boyd and De Nicolo (2005) developed an alternative view on the link between bank market power and financial stability, which is regularly alluded to as the “competition-stability” hypothesis. By considering the competition in both deposit and loan four markets, higher market power in the deposit market will drive banks to increase their loan interest rate.

Market power is inversely related to the number of organizations participating in the market. The more the quantity of organisation the less the market power, and this is the reason the business should not have an excessive number of members assuming it needs to hold extensive power. According to Kouki and Ali-Nasser (2014), market power has benefits for both stability and risk in the banking sector, while Leon (2015) states that market power can be unsafe in banking.

In a few studies, the topic of market power in South African retail banking has been addressed on (Goga et al., 2014). Unexpectedly, the Banking Enquiry Panel of the Competition Commission spent considerable time discussing the subject in its final conclusion. The ability of a business to charge prices above those that would prevail under competitive conditions was defined as market power in the inquiry report (Competition Commission of South Africa, 2021). The Banking Enquiry Panel discovered that established banks enjoyed market strength arising from many components in the market for personal transactional accounts. Economies of scale were used to define retail banking, which makes it difficult for medium-sized businesses to compete in the market. Market concentration is supported by high fixed and shared expenses. The banks are portrayed, in the report, as staying away from pricing competitiveness to the extent that was conceivable yet contending on different measurements. The Panel argued that the banks were exploiting different mechanisms to secure clients in a specific banking institution (Makhaya & Nhundu, 2016). Delis et al. (2015) asserted that the performance of borrowing firms is influenced positively by bank market power, while Alhassan et al., (2016) discovered that market power does not necessarily lead to significant profits for banks.

2.2.2 Barriers to entry

Retail banking entrance barriers are primarily the result of sunk costs, related economies of scale, legislation, and the necessity for interoperability (O'Donoghue & Padilla, 2006). When entrance into a typical industry is difficult, the players have more clout in the market. The new entrants cannot enter and endure the market due to a few components such as low pricing or less information. PMG (2021) observed that in general, the commercial financial sector displays stringent entry requirements. It entails a generous measure of funds, also it is subject to networking, organizing influences, scaling economies, and has regulatory constraints for ethical reasons. Buyer substitution costs mean that it takes a long time to create a client base and achieve a profit. Mlambo and Ncube (2011) as well as Simbanagevi et al., (2014) research discovered South African banking industry will be monopolistic. Bikker et al., (2012) additionally included South Africa in their multi-country investigation and discovered that the banking sector in South Africa operates in a monopolistically competitive structure.

According to the Competition Commission of South Africa (2021), barriers to entry are generally high in retail banking. The high proportion of fixed and common costs (including the cost of branch networks, other infrastructure and ensuring interoperability), and the consequent importance of economies of scale and scope, are themselves significant boundaries to the section, endurance and serious development of new firms. The multi-product nature of retail banking also creates opportunities for cross-subsidisation by incumbents, which potentially increases the handicap facing new firms. Other barriers include the regulatory requirements for entry and participation in the banking industry, the costs looked at by clients of incumbent banks in changing to new providers, and the effects of brand loyalty (Makhaya & Nhundu, 2016). Makhaya and Nhundu (2016) further state that any new participants face the difficult test of drawing in new customers. In retail banking, this is made particularly difficult by the inherent inertia of customers in this complex industry, and the established reputation of incumbent brands.

The retail banking industry in South Africa continues to remain extremely entrenched, with six major banks—Standard Bank, Absa, First National Bank, Nedbank, Capitec, and Investec—accounting for more than 90% of all retail deposits. The study of entry and competition in South Africa found that the country's top retail banks can be considered to

value market power obtained from several things, such as restrictions on the entry and expansion of smaller banks (Okeahalama, 2007). Regulations, scale economies (such as the requirement to develop a branch network), and the necessary financial backing are the primary obstacles to entry and expansion. When Capitec was able to overcome the challenges of being a successful rival, the rivalry it created served as an example of the advantages of competition as bank fees significantly decreased. The Capitec case study by PMG (2021) highlights how competition has drastically lowered costs and increased access to financial services. But in many ways, the Capitec example highlights persistent banking problems that must be resolved if new business models and creative ways of delivering financial services are to be established without jeopardizing financial stability.

The researchers find that barriers to entry and expansion are generally high in retail banking, including the provision of PTAs. The high proportion of fixed and common costs (including the cost of branch networks, other infrastructure and ensuring interoperability), and the consequent importance of economies of scale and scope, are themselves major barriers to the entry, survival and competitive expansion of new firms. The multi-product nature of retail banking also creates opportunities for cross-subsidisation by incumbents, which potentially increases the handicap facing new firms. Other barriers include the regulatory requirements for entry and participation in the banking industry, the costs faced by customers of incumbent banks in switching to new providers, and the effects of brand loyalty (Competition Commission, 2021). Brown (2019) states that new competitors in the banking sector have typically begun by focusing on niche markets. The competition has shifted from traditional competitors to fintech disruptors. Many fintech companies have struggled to scale up alongside traditional banks such as Discovery Bank, Bank Zero, and Tyme Bank.

Competition Commission (2021) new entrants would face considerable difficulties attempting to attract customers based on competitive pricing. They would have to be able to offer a significantly lower price and satisfy consumers to sustain that price difference and attract customers from the incumbents. This factor adds considerably to barriers to entry, and so reinforces the incumbents' market power. Consumers tend to place a high premium on the reputation of incumbents' brands. This is particularly true in the case of

banking where consumers perceive an established brand as being representative of the stability of the bank and thus the security of their deposits. The consumer survey conducted for the Enquiry by KLA found that consumers perceived larger banks to be more secure and stable. It was noted that “advertising is more strongly associated with bigger banks which in turn emphasises their stronger sense of establishment”. 105 Trust and security were among the themes typically invoked. Further, in differentiating between small banks and large banks, most participants in the survey associated greater stability and financial security with “big banks” as opposed to “small banks”.106 Consumers appear to have bought into the notion of some banks being “too big to fail” (Competition Commission, 2021). Tyme bank's market entry was based on a simple banking proposition. The transactional banking account was the least expensive on the market. It was not only about charging low rates; it was also about establishing a low-cost foundation to be able to do it continuously. The cost basis was built with a low-cost technological stack in mind (PMG, 2019). In general, the barrier to entry has a significant impact on a company's overall profitability. According to Islami et al., (2019) findings, industry barriers help incumbents increase their profitability while also preventing rivals from entering the market. Industry barriers have a positive impact on the profitability of existing firms.

2.2.3 Market competition

Zeder (2020) asserted that market structures are classified into four types: perfect competition, monopolistic competition, oligopoly, and monopoly. Perfect competition describes a market structure in which many small firms compete with similar products. Meanwhile, monopolistic competition refers to a market structure in which many small firms compete with differentiated products against each other. An oligopoly is a market structure in which a small number of firms compete with one another. Finally, a monopoly is a market structure in which a single firm controls the entire market. South African banking is regarded as monopolistic competition in this study.

Oligopoly refers to a situation in which there are only a few sellers. In an oligopolistic market, each seller supplies a significant part of the total number of products sold. The cost of starting a business is typically high, and the number of businesses that enter it is

typically limited (DB, 2021). According to De Gray Birch (2021), South African banks have long operated as an oligopoly, assuming that if they followed all of the country's banking regulations, clients would trust them.

According to Toppr (2021), in a monopoly market structure, there is only one seller, so a single firm controls the entire market. Monopoly can set any price it wants because it has full market power. Customers have no choice but to pay the price set by the seller. Eskom is a monopoly electricity supplier and provider in South Africa (Sapeople, 2021). Napier (2005) observed that South African banks are perceived to be complex monopolies with high entry barriers.

Many buyers and sellers exist in a market structure with perfect competition. All the market's sellers are small businesses competing with one another. There is no single large seller who wields significant market power. As a result, all firms in such a market are price takers (Toppr,2021). Al-Muharrami (2009) find that banks in Kuwait and Saudi Arabia operate under perfect competition market conditions.

According to ANALYSTPREP (2021), monopolistic competition is an imperfect competition in which several producers sell products that differ from one another. The distinction is based on branding or, in most cases, quality. This means that the goods are not perfect substitutes for one another, but they are close substitutes. Hamza and Kachtouli's (2014) and Abdelkader and Mansouri's (2013) findings suggest that the banking sector operates in a monopolistically competitive structure in the Middle East and North Africa region. Banks in South Africa operate in monopolistically competitive markets (Simatele, 2015). Mlambo and Ncube's (2011) and Simbanagevi et al., (2014) studies are also in favour of monopolistic competition in the South African banking industries.

Competition within a market can take many forms. At a base level, it can be broken down into two categories: competition between existing players and potential competition from new entrants. Fintech is considered the biggest competitor of traditional banks, therefore, both fintech and banks work as financial intermediaries. Traditional banking is the fact that these new financial competitors are innovating and growing in emerging countries. Disruption has occurred in virtually all industries in the last two decades, and it is also

starting to transform the financial industry. Banks, which maintained their dominant position thanks to factors such as highly regulated environments, are seeing the emergence of new competitors that threaten to steal a substantial market share, if not displace the incumbent banks from their leadership position. Banks can maintain a degree of leadership and defend themselves against threats from new entrants such as big techs by transforming themselves into fintech banks or marketplace banks (Noya, 2019). Fintech can be simply defined as the use of technological innovation in financial services (Vives, 2019). Vives (2019) states that the disruption in financial services may harm traditional banks' financial performance. However, it could also lead to the offering of efficient banking services as well as more cost-efficient services for their clients.

Locally, Entry into the retail banking profession is difficult. It demands significant capital, is subjected to economics of scale, and is governed by regulatory constraints for financial objectives. The big four banks in South Africa, namely Absa, FNB, Nedbank and Standard Bank, have dominated the South African market for years, with Investec having a strong market share in its chosen specialist markets of investment and asset management such as Equity Structured Products – Hedge Fund, private credit markets and dividend-yielding preference shares. The rapid rise of Capitec has upped the ante in personal lending and transactional banking. Now competitors from adjacent industries and non-financial service providers are gaining more market share from the bigger banks (Banking Matters, 2019). According to Ngonyama and Simatele (2017), in a market where there is free entry and exit, the profits in that market are likely to be zero.

The "Mzansi account" was first made available to the unbanked populace in the early years of Capitec, around 2004. The market's low-income/low-revenue segment has also seen the introduction of goods and services by the incumbents. These included the introduction of mobile branches by FNB and the collaboration between branchless banking at Pick and Pay and Nedbank by Nedbank and Standard Bank (Makhaya & Nhundu, 2016). Capitec did not participate in the Mzansi initiative but introduced a low-cost banking solution that utilizes digital technology to reach to mass-market consumers (Makhaya & Nhundu, 2016). Historically, South African retail banking consumers did not readily move banks, partially because it was perceived as a time-consuming procedure.

Prior to 2001, low-income clientele may have trusted the big four banks more than new entrants since the former had established brands and reputation. Banking clients have become more intelligent, according to FinMark Trust (2014). Four million people moved banks in the run-up to the Finscope research (FinMark Trust, 2014).

Initially, three of the four major incumbents did not perceive Capitec as a rival; however, they have since retaliated with comparable services (Capitec, 2015). These include Easy Account and Smart Unlimited from FNB as well as Transact from ABSA. The advent and expansion of Capitec in transactional banking triggered a competitive response from incumbents, particularly FNB and ABSA. These banks now provide goods that compete with Capitec's low-cost, uncomplicated, information-technology-driven, digitally mediated offering. Fees for low-cost accounts have decreased in nominal terms across all four incumbent banks. These impacts are unlikely to have occurred if the status quo had remained without a disruptive newcomer, or if Capitec had been bought early on by one of the incumbents. Capitec implemented disruptive impacts at the technological innovation and service layers (Makhaya & Nhundu, 2016). Based on a study aimed at investigating the impact of competition on bank performance in Bangladesh, in terms of profitability and efficiency, competition harms the performance of banks (Sohrab Uddin & Suzuki, 2014).

2.2.4 Financial intermediary theory

Current financial intermediation theory builds on the notion that intermediaries serve to reduce transaction costs and informational asymmetries. In terms of the financial intermediation banking theory, banks are purely intermediaries like any other non-bank financial institution, collecting deposits that are then loaned out (Werner, 2014). Gurley and Shaw (1960) are the founders of the financial intermediation theory. Transaction cost served as the foundation for banking industry theories in the past, agency theory and asymmetric information (Gurley & Shaw, 1960). According to Scholtens and Van Wensveen (2003), financial intermediary theory exists due to market imperfections such as developments in information technology, deregulation, and the deepening of financial markets.

Traditional theories of intermediation are based on transaction costs and asymmetric information. They are designed to account for institutions that take deposits or issue insurance policies and channel funds to firms. However, in recent decades, there have been significant changes. Although transaction costs and asymmetric information have declined, intermediation has increased. Financial intermediation theory, as developed by Diamond (1984), is primarily focused on the role of relationship lenders who develop close relationships with borrowers over time. This proximity between banks and borrowers facilitates monitoring and screening and can overcome problems of asymmetric information between the two parties. According to Scholtens and Van Wensveen (2008), there are empirical observations that point to the fact that there is an increasing role for financial intermediaries in economies that experience vastly decreasing information and transaction costs.

2.2.5 Transaction cost

Transaction cost theory is part of corporate governance and agency theory. It is based on the principle that costs will arise when an employer gets an employee to do a job such as a director to run the business you own. Transaction cost theory and agency theory essentially deal with the same issues and problems where agency theory looks at the tendency of directors to act in their best interests and transaction cost theory considers that managers may arrange transactions opportunistically. Agency theory focuses on the individual agent, transaction cost theory focuses on the individual transaction (Kaplan Financial, 2021). Coase (1937) proposed the concept of transaction cost theory. Hence Benkler (2006) and Williamson (1985) regard Ronald Coase as the father of transaction cost theory. Transaction costs comprise the sum of costs needed for seeking information, negotiation, contracting, management compliance, and handling of breach of contract (Coase, 1937). Coase (1937) defined the theory as focusing on saving transaction costs, analysing each transaction as a single unit, and distinguishing the characteristics of various transactions.

Coase (1937) analysed and classified different transactions to facilitate coordination by specific bureaucratic organisations. Transaction costs are the costs required for obtaining accurate market information (Coase, 1937). Such costs are ubiquitous and affect all

economic activities. The theory can coordinate the organisational behaviour towards better justice, order, and security. Transaction cost theory focuses on the economic interaction between two parties, not specifically on a production setting. A transaction can be defined as actions “when a good or service is transferred across a technologically separable interface” (Williamson, 1985). Shiller (2012) stated that financial intermediaries reduce transaction costs by connecting market participants and building trust. In general, financial intermediaries also reduce transaction risk in terms of counterparty risk, such as when engaging in transactions, there is a risk that the counterparty will fail to fulfil their contractual obligations. When counterparties fail to meet their contractual obligation transaction risk management is frequently incorporated into transaction contract clauses or the deal process. Dharmadasa (2021) stated that the transaction cost approach considers non-convexities in transaction technology. Williamson (1975) considered the transaction costs surface from the market failure created by the interplay of different causes of human nature and appropriate elements of the trading environment.

According to Cheung (1999), the transaction cost is the institution cost – any costs that arise from the existence of institutions. Benkler’s (2017) version of transaction cost theory revolves around technology. Digitisation has led to many incumbent non-digital firms embracing new digital business models (Altman et al., 2015; Hagiú & Altman, 2017). The banking sector continues to embrace innovations and the intensity and variety of risks that the players are exposed to also continue to increase in tandem (Kemei, 2014). Financial intermediaries’ capacity to make transactions more affordable promotes specialization, technology progress, and expansion (Levine, 1997). According to Henten and Windekilde (2015), without digital platforms, the transaction costs would generally be much too high for such commercial markets to develop.

The theory of transaction cost mainly includes three dimensions: asset specificity, uncertainty and transaction frequency (Williamson, 1985). Asset specificity mainly includes human assets, material assets and geographical location. Transaction cost theory pays more attention to the cost of asset specificity, in general the cost of assets increases when the assets are more specific and less likely to be used for other reasons. Transaction uncertainty mainly refers to the uncertainty of the transaction environment.

The uncertainty of the transaction system has a serious impact on transaction costs, resulting in stronger uncertainty and higher transaction cost (Deng & Zhang, 2020).

Williamson (1988) argues that there are ex-ante and ex-post transaction costs, and different transactions typically involve different types of transaction costs. Therefore, researchers observe that the reduction of transaction costs has a guiding incentive on the choice behaviour of the decision-makers. Meanwhile, every consumer is a decision-maker when trading, and transaction cost considerations empower consumers to select the options that are good for themselves. Transaction costs also play an important role in a firm's capital structure decision. These transaction costs are associated with obtaining new external financing which is higher than the costs of obtaining internal financing. Chen (2011) further states that the transaction costs are associated with obtaining new external financing which is higher than the costs of obtaining internal financing (Chen, 2011).

Ahluwalia et al., (2019) breaks down the transaction costs into their components to provide a better understanding of how blockchain technology impacts these transactional costs. Primarily, transaction costs can be divided into Search Costs, Verification Costs, Transportation Costs, Tracking Costs, Replication Costs, and Contractual Costs. Search costs are incurred when one party to the transaction looks for the counterparty. Verification costs are incurred to verify that the shortlisted counterparty has the wherewithal to complete the transaction. Transportation costs are incurred when the exchanged good or service changes hands. Tracking costs are incurred to track the transaction and to track the moment of the good or service to its designated place. Finally, replication and contractual costs are incurred to check the contract in the future and to ensure its validity for future actions. Blockchain technologies can contribute to the reduction in each of these costs and further reduces environmental uncertainty through their unique approach to ensuring trust (Ahluwalia et al., 2019).

2.2.6 Asymmetric information

Asymmetric information acts as a study of agreement in transactions where a seller has greater or better information than the buyer or implies that one party in the transaction has all the relevant information, while the other does not. Akerlof (1970) and Spence

(1973) are economists who developed the theory of asymmetric information which was established in 2001. Due to information asymmetry, financing is restricted even when the borrower is prepared to pay a higher interest rate under any parameters of the credit (Jaffee & Modigliani, 1969). Kemei (2014) says that banks evaluate borrowers' creditworthiness, and this will lead to deserving borrowers getting the loan, hence reducing the high rate of loan defaults. According to Kemei (2014), the primary reason why people give their money to financial intermediaries instead of lending or investing the money directly is because of the risk that is present from the information asymmetry between the provider of funds and the receiver of those funds. A seller knows more about the sale item than the buyer and the buyer would be taking a risk buying the item. Customers with enough information can use the information to make efficient and rational decisions, and firms have the incentive to provide products that best meet the needs of their customers. Businesses are forced to compete with one another because consumers are well informed to distinguish between different firms' offerings (Competition Commission of South Africa, 2021).

Lack of affordable and accessible formal savings channels in the presence of information asymmetry affects the saving behaviour of many low-income earners which contributes to income inequalities (Galor & Zeira, 1993; Becker & Tomes, 1986). According to Mostafa and Boregowda (2014), information asymmetry may be related to a firm's value or related to a firm's risk.

According to the Competition Commission of South Africa (2021), information asymmetry describes the situation in which one party to a contract has the advantage of having more information than the other so that the latter is effectively in the dark when weighing up the likely costs and benefits of the deal. There are considerable information asymmetries in the market for personal transactional accounts and related services which tend to benefit the banks but are detrimental to consumers. These asymmetries arise not only from the complexity already described but also from inadequate transparency and disclosure in respect of the features and pricing of transactional banking products. The Competition Commission of South Africa (2021) further states that consequently, the great majority of consumers do not actively investigate what they are paying in bank fees, and neither do

they respond readily to changes in prices by seeking out an alternative provider. This is an important factor conferring on banks an appreciable degree of market power over their customers.

2.3 CAPITAL STRUCTURE THEORIES

Capital structure theory refers to a scientific approach to financing business activities through a mix of equities and debt. The theory of capital structure has the greatest effect on WAAC (weighted average cost of capital) and a reduction in WAAC is caused by the cheaper debt while an increase in WACC is caused by the increase in financial risk. According to Myers (2001), capital structure is the way to finance the operation of a business by using different means of financing such as debt and equity. Sound capital structure in a bank provides security and safeguards depositors and lenders (Bruce & Pradip, 2008). An organisation's capital structure is the essence of maximising wealth and minimising the cost of capital (Sheikh & Qureshi, 2017), while Titman and Wessels (1988) noted that firms choose financing that minimises costs and maximises the benefits associated with different sources of debt and capital. However, Modigliani and Miller (1958) argue that the cost of a levered company is the same as the significance of an unlevered business. O'Brien et al., (2014) indicated that agency theory predicts that debt should lead to higher performance for diversifying firms while transaction cost predicts that more debt will lead to a lower performance for firms expanding into new markets.

Modigliani and Miller (1958) demonstrated that capital structure is irrelevant under certain restrictive assumptions such as no taxes, no bankruptcy costs, no transaction costs, no agency costs, and no information asymmetry in a fully efficient market. Modigliani and Miller (1958) further stated that there is no optimal debt-to-equity ratio and capital structure is irrelevant to the shareholders' wealth. Capital structure irrelevance theory was theoretically very sound but was based on an unrealistic set of assumptions, hence a world without taxes was therefore not valid (Modigliani and Miller, 1963) and incorporated the effect of tax on the cost of capital and firm value.

The study of the fulfilment of firm funding sources is often known as capital structure theory. Capital structure theory looks at how the composition of long-term debt with ideal

stocks obtains optimal capital structure. Optimal capital structure is evident from the improvement of the welfare of the company owners, but there is still no common agreement regarding the study of how to realise the optimal capital structure. One study of capital structure is to maximise the use of debt up to a certain level to obtain tax savings due to interest payments (Oktavina et al., 2018).

Hailu (2015) discovered that total debt-to-asset has a significant and negative impact on the net interest margin, using net interest margin as an indicator of bank performance and total debt-to-asset as independent variables from 2001 to 2012 investigating the impact of capital structure on the profitability of eight Ethiopian commercial banks. Ihe

anyi et al., (2016) contended that while the capital structure has a positive effect on the return on equity, it has an inverse effect on the return on assets for Nigerian banks.

2.3.1 Trade-off theory

Trade-off theory's first version was created following the argument of Modigliani Miller's theory. Firms establish their best possible target capital structure with a debt-to-equity ratio based on borrowing and balancing the charge of borrowing (Myers, 1984). Kraus and Litzenberger's (1973) theory on trade-off are built upon the MM proposition even though the existence of corporate taxes and bankruptcy risks reality is different, there are advantages to debt, namely, tax savings but debt is not free and comes with bankruptcy risks.

The capital structure trade theory is the idea that the company chooses how much debt to lend and how much equity lending to use, balancing costs and benefits. According to Mostafa and Boregowda (2014) and Westerlund (2020), in traditional trade-off theory companies have one optimal debt target leverage which is where firms are using 100% debt financing. According to Sheikh and Wang (2010), the target capital structure should be chosen to maximize company value while minimizing the costs of existing market imperfections. Firms determine their own target level of debt ratio as optimal according to some factors suggested by prior works like characteristics of the industry in which the firm was operating its business (Schwartz & Aronson, 1967).

The trade-off theory of capital structure is the idea that a company chooses how much debt finance and how much equity finance to use by balancing the costs and benefits. The classical version of the hypothesis goes back to Kraus and Litzenberger (1973). Trade-off theory attempts to measure the extent and speed of rebalancing a firm's debt ratio towards the presumed target. Khoa and Thai (2020) stated that the trade-off model assumed that any variation in the gearing for each year would be adjusted towards the optimal level of leverage with a specific target debt ratio.

However, Chirinko and Singha (2000) doubted that the target debt ratio also changed over time, rather than being a constant figure. As a result, the target debt ratio was used as a function of long-term determinants. Debt can be used as an instrument to align the interest of managers and shareholders (Jensen & Meckling (1976). According to Jensen (1986), however, debt financing may also cause conflicts of interest between shareholders and creditors, which could e.g., lead to sub-optimal investment policies. The trade-off theory assumes that firms must balance their bankruptcy and agency cost of debt through the tax benefit of debt to have an optimal capital structure (Dincergok & Yalciner, 2011)

2.3.2 Pecking order theory

Pecking order diagram

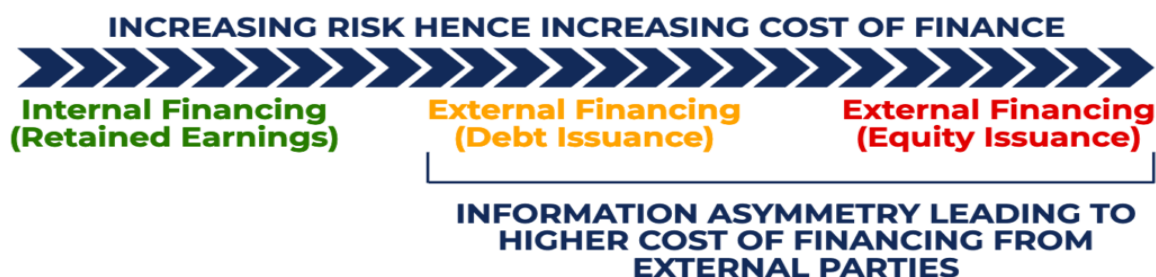


Figure 2.1 Pecking order diagram

<https://corporatefinanceinstitute.com>

The major prediction of the pecking order theory is that firms will not have a target optimal capital structure but will instead follow a pecking order of incremental financing choices that place internally. The pecking order theory was established by Myers Sanders in 1984.

According to Myers (1984), a firm should carry out a particular pecking order to finance its resources. According to pecking order theory, an optimal capital structure can be found through a trade-off between the advantages and disadvantages of debt financing. The firm uses reserves generated internally which are retained earnings, thereafter debt and if more finances are required then assets should be acquired using equity capital. Park (1998) and Jahanzeb et al., (2014) stated that highly profitable firms usually use more internally generated resources/retained earnings to back the firm at the cost of using debt or putting shares in the market. By avoiding equity problems, Myers (1984) contends that outsiders can avoid wealth transfer and adverse selection. According to Mostafa and Boregowda (2014), small companies with more growth opportunities should issue additional debt than equity and further state that the pecking order theory does not consider optimal capital structure.

Myers (1984) and Myers and Majluf (1984) information asymmetries are assumed relevant only for external financing. Information asymmetry was ignored by trade-off theory. Later, the pecking order theory, which explored the conflict that arises from information imbalance between insiders and outsiders, introduced this issue. The pecking order theory, however, does not consider an ideal capital structure (Mostafa & Boregowda, 2014). Brealey et al., (2008) stated that the pecking order theory starts with asymmetric information as managers know more about their company's prospects, risks and value than outside investors. Asymmetric information affects the choice between internal and external financing and between the issue of debt or equity. Myers and Majluf (1984) noted that the pecking order theory is based upon costs derived from asymmetric information between managers and the market and the idea that trade-off theory costs and benefits to debt financing are of issuing new securities. The cost of equity includes the cost of a new issue of shares and the cost of retained earnings. The cost of debt is cheaper than the cost of both these sources of equity funds.

External funds can be very costly due to floatation costs and the problem of asymmetric information, especially for financially constrained firms (Fazzari & Petersen, 1993). A firm can either use debt or equity to finance new investments and mostly will issue the safest security first that is debt before equity (Myers, 2001). Companies maximise their value by

choosing to finance new investments with the cheapest available sources (Sheikh & Wang, 2010). Mostafa and Boregowda (2014) pointed out that the pecking order theory suggests that firms rely on internal sources with the lowest information asymmetry costs, then debt and ultimately equity with the highest information asymmetry costs. Firms don't have optimal debt ratios and hence the firm's debt ratio is representing the accumulated external financing required. As this theory says, firms with more profitability issue less debt. Mostafa and Boregowda (2014) further stated that the pecking order theory proposes that small firms with more growth opportunities should issue more debt than equity. One should distinguish between a firm's information asymmetry and the industry's information asymmetry, but the type of industry they are working in has a more volatile environment and, therefore, more information asymmetry.

2.3.3 Agency cost theory

Agency cost diagram

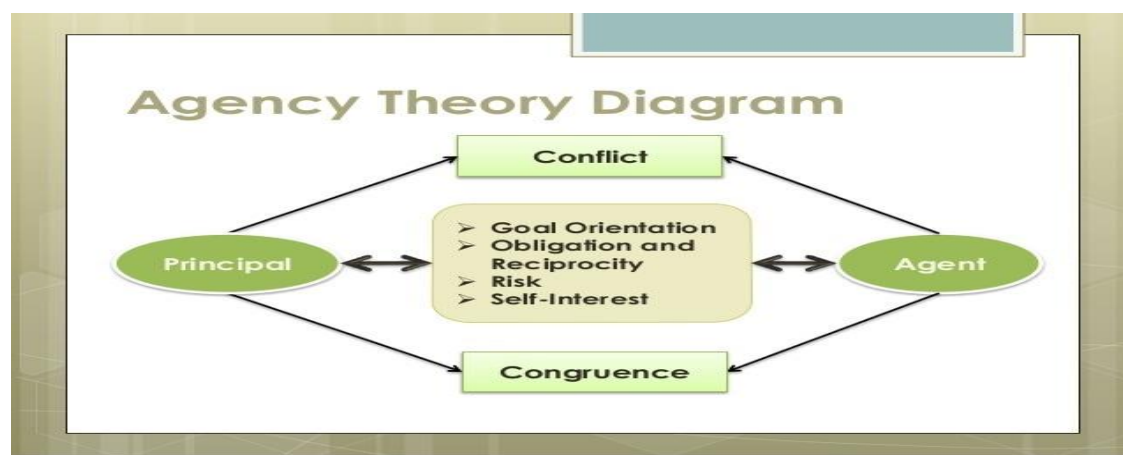


Figure 2.2 Agency cost diagram

<https://www.bing.com/images>

Jensen and Meckling (1976) addressed the agency theory as the fundamental problem of managing a firm's capital structure from the cheapest source of funds. Arnold (2008) stated that agency costs are direct and indirect costs that result from principles and agents acting in their best interest and, failure to make agents act this way. According to Alebachew (2020), agency theory reflects debt to be an essential factor that creates

conflict among equity holders and managers. Jensen and Meckling (1976) noted that an agency relationship exists when one or more persons engage another person to perform some service on the theory's behalf, which involves delegating some decision-making authority to the agent. Atkinson (1978) observed that in most agency relationships the agent is better informed than the principal about the possibilities facing the firm. This inherently creates a fundamental problem for control since most of the information relevant to the control of the agent's behaviour is possessed by the agent and not the principal. Managers can undertake safer projects with lower returns than the principal may deem desirable. Atkinson (1978) concluded that when responsibility and information are decentralised and in the presence of an incentive scheme the agent employs their superior information in a manner that is mutually beneficial to both the agent and the principal.

Agency costs are transaction costs reflecting the fact that without incurring these costs principals can't ensure agents will act in the principal interests. Agency costs include the costs of investigating and selecting appropriate agents, gaining information to set standards, monitoring agents, bonding payments by agents and residual losses (Dzikamai, 2011). Mahler and Regan (2005) documented that by reducing the costs of information gathering to the principal because of the internet, control of the agent and their outcomes became easier and more effective.

The agency theory of capital structure is based on conflicts between managers and shareholders, primarily because managers operate for their own advantage while shareholders must act for the good of all shareholders.

2.4 Demand for money theory and liquidity preference theory

Demand and liquidity diagram

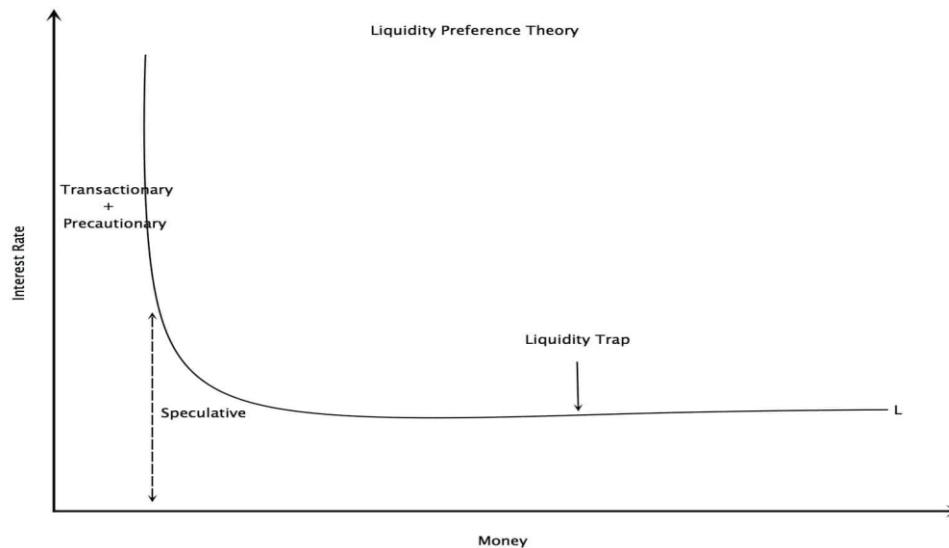


Figure 2.3 Demand and liquidity diagram

www.intelligenteconomist.com/liquidity-preference-theory

Keynes proposed a theory of demand for money which involves a vital place in monetary theory and used the term “liquidity preference for demand for money” (Keynes, 1936). According to Finkler et al., (2018), the General Theory of Employment, Interest and Money takes into consideration liquidity desire as a call for cash via figuring out the pleasant aggregate among cash holdings and the prospective risks, thinking that the extra hastily an asset is transformed into cash, the extra liquid it is. Liquidity preference implies the demand for money to hold or the need of the people to hold cash. People are exceptional in the number of cash holdings they are inclined to keep. The aspiration for liquidity arises through three motives which are the transaction motive, precautionary motive and precautionary motive (Keynes, 1936). Tobin’s approach has done away with the limitation of Keynes’s theory of liquidity preference for speculative motive, namely, individuals hold their wealth in either all money or all bonds (Tobin, 1956). Therefore, Tobin's approach is according to which individuals simultaneously hold both money and bonds but in different proportions at different rates of interest.

Demand for money and liquidity preference is influenced by a variety of factors, including income level, interest rates, inflation, and future uncertainty. In contrast to Keynes's theory, which holds that demand for money is for transaction purposes and is insensitive to interest rates, modern theories of money demand advanced by Baumol and Tobin show that money held for transaction purposes is interest-elastic. Subtopics that build on this section are described below.

2.4.1 The transaction motives

The transaction motive pertains to the need for money balances for the current transactions of individuals and companies. Businessmen and entrepreneurs also must maintain a percentage of the resources in a money form as a way to meet day-by-day desires of diverse kinds. Firms need money all the time to pay for raw materials and transport, to pay wages and salaries and to meet all other current expenses incurred by any business firm. According to Keynes (1936), the transaction demand for money depends solely on real income and is not influenced by the speed of interest. However, in recent years, it has been determined through empirical observation and conjointly in line with the theories of Tobin (1956) and Baumol (1952) whereby transactions that demand money also depend on the rate of interest. Individuals and firms hold money balances by carefully managing balances through the transfer of money into bonds or short-term income-yielding non-money assets. Thus, at higher interest rates, individuals and business firms will keep fewer money holdings at each level of income.

2.4.2 The precautionary motive

The speculative motive of the people relates to the desire to hold one's resources in liquid form to take advantage of market movements regarding future changes in the rate of interest (or bond prices). The notion of holding money for a speculative motive was a new and revolutionary Keynesian idea. Money held under the speculative motive serves as a store of value as money held under the precautionary motive does, but it is a store of money meant for a different purpose (Keynes, 1936).

The cash held under this motive is used to make speculative gains by dealing in bonds whose prices fluctuate. If bond prices are expected to rise which, in other words, means that the rate of interest is expected to fall, businessmen will buy bonds to sell when their prices rise. If, however, bond prices are expected to fall when the rate of interest is expected to rise, businessmen will sell bonds to avoid capital losses.

Keynes's theory of speculative demand for money has been challenged. The main drawback of Keynes's speculative demand for money is that it visualises that people hold their assets in either all money or all bonds. This seems quite unrealistic as individuals hold their financial wealth in some combination of both money and bonds. This gave rise to the portfolio approach to the demand for money put forward by Tobin (1956), Baumol (1952) and Friedman (1959).

2.4.3 Demand for money (Tobin's approach)

Tobin (1956) explained that rational behaviour on the part of individuals is that they should keep a portfolio of assets which consists of both bonds and money. In his analysis, he makes a valid assumption that people prefer more wealth to less. According to Tobin, an investor is faced with the problem of what proportion of his portfolio of financial assets he should keep in the form of money (which earns no interest) and interest-bearing bonds.

The portfolio of individuals may also consist of more risky assets such as shares. According to Tobin, faced with various safe and risky assets, individuals diversify their portfolios by holding a balanced combination of safe and risky assets. He points out that individuals' behaviour shows risk aversion. That is, they prefer less risk to more risk at a given rate of return. In Keynes's analysis, an individual holds his wealth in either all money or all bonds depending upon his estimate of the future rate of interest. But, according to Tobin, individuals are uncertain about the future rate of interest (Tobin, 1956).

If a wealth holder chooses to hold a greater proportion of risky assets such as bonds in their portfolio, they will be earning a high average return but will bear a higher degree of risk. Tobin argues that a risk averter will not opt for such a portfolio with all risky bonds or a greater proportion of them (Tobin, 1956).

2.4.4 Liquidity preference theory

Tobin (1956) derived his liquidity preference function depicting the relationship between the rate of interest and demand for money which is a preference for holding wealth in money form which is a safe and riskless asset. He further argues that with the increase in the rate of interest, wealth holders will be generally attracted to hold a greater fraction of their wealth in bonds and thus reduce their holding of money. In general, there is an inverse relationship between liquidity and bank profitability – when liquidity rises, profitability falls (Marozva, 2015). Firms that manage a trade-off between liquidity and profitability can achieve liquidity (Bhunia & Khan 2011). Niresh (2012) investigated the trade-off between liquidity and profitability and discovered that there is no significant relationship between liquidity and profitability among Sri Lanka's publicly traded manufacturing firms. The impact of liquidity on profitability was investigated and it was discovered that correlation and regression results are significantly positively associated with firm profitability (Bhunia et al., 2012). According to Oyewo (2020), a bank must strike the best trade-off between liquidity and profitability goals. If a bank keeps little cash on hand to meet demand deposits (low liquidity), it will have more funds to invest in medium and long-term investments that yield higher returns (high profitability).

Liquidity preference theory graph

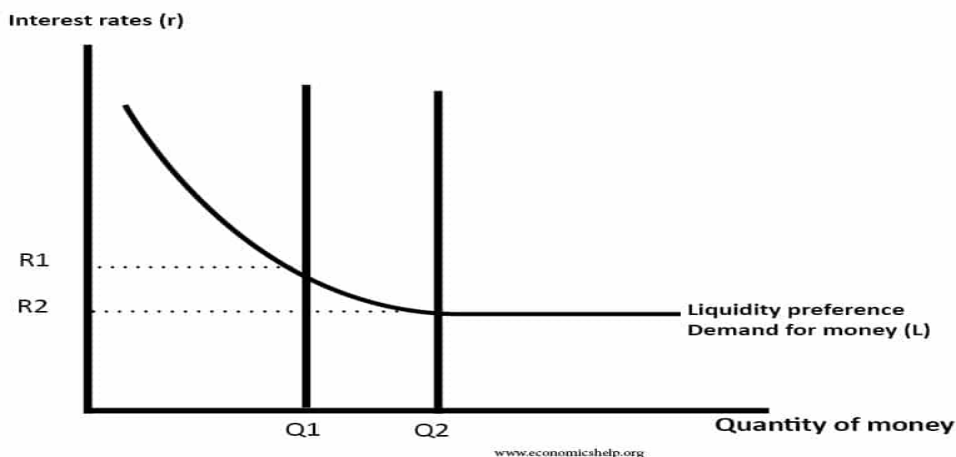


Figure 2.4 Liquidity preference theory

www.economicshelp.org/blog/glossary/demand-for-money

2.4.5 Baumol's inventory approach (transaction demand for money)

Instead of Keynes's speculative demand for money, Baumol concentrated on transactions' demand for money and put forward a new approach to explain it. Baumol (1952) explained the transactions demand for money from the viewpoint of inventory control or inventory management similar to the inventory management of goods and materials by business firms.

As businessmen keep inventories of goods and materials to facilitate transactions or exchange in the context of changes in demand, Baumol (1952) asserted that individuals also hold an inventory of money because this facilitates transactions that are purchases of goods and services.

Given the cost incurred on holding inventories of goods, there is a need for keeping an optimal inventory of goods to reduce cost. Similarly, individuals have to keep an optimum inventory of money for transaction purposes. Individuals also incur costs when they hold inventories of money for transaction purposes (Baumol, 1952).

They incur costs on these inventories as they have to forgo interest which they could have earned if they had kept their wealth in saving deposits or fixed deposits or invested in bonds. This interest income forgone is the cost of holding money for transaction purposes. In this way, Baumol (1952) and Tobin (1956) emphasised that transaction demand for money is not independent of the rate of interest.

Unlike Keynes, both Baumol (1952) and Tobin (1956) argued that transactions demand money depending on the rate of interest. People hold money for transaction purposes to bridge the gap between the receipt of income and its spending. As the interest rate on saving deposits goes up people will tend to shift a part of their money holdings to interest-bearing saving deposits.

2.4.6 Friedman's demand for money theory

As per Friedman (1959), the demand for money is the most significant consistent function

in macroeconomics. Friedman considers money to be one form of asset in which wealthy individuals can store some of their assets. Monetary is viewed as a financial instrument or a factor of production by large corporations, which could be combined with the services of other tangible capital or labor to produce goods and services. Moreover, Friedman (1959) states that individuals hoard money because of the services it offers.

Friedman considers the demand for money merely as an application of a general theory of demand for capital assets. Keynes (1936) emphasised current income as the main determinant of demand for money, while Friedman (1959) emphasised wealth, both human and non-human, as the main determinant of money. Keynes (1936) regarded the money demand function as unstable while Friedman considered it stable over time.

2.5 CONCLUSION

This study aimed at investigating effectiveness of theories on the profitability of banks. Several research studies have addressed an issue about market power in South African retail banking. According to Delis et al., (2015), bank market power has a positive impact on the performance of borrowing firms. Based on this study, the banking sector in South Africa has a monopolistically competitive structure (Simatele, 2015; Mlambo & Ncube, 2011; Simbanagevi et al., 2014), even though De Gray Birch (2021) claims that South African banks have long been an oligopoly. According to Napier (2005), South African banks are perceived to be a complex monopoly with high entry barriers. Financial intermediaries, according to Scholtens and Van Wensveen (2003), exist as a result of market imperfections.

The competition has shifted from traditional competitors to fintech. According to Vives (2019), financial service disruption may harm traditional banks' financial performance. According to Henten and Windekilde (2015), without digital platforms, transaction costs would be far too high for such commercial markets to develop. This transaction cost is associated with obtaining new external financing, and it is greater than the cost of obtaining internal financing (Chen, 2011).

According to Iheanyi et al., (2016), capital structure has a positive effect on return on equity but a negative effect on return on assets for Nigerian banks. Sumani and Roziq

(2020) asserted that capital structure harms corporate performance. Per Myers and Majluf (1984) there is a negative relationship between solvency and performance. Dalci (2018) research denoted that leverage has both a positive and negative impact on profitability. Ali (2020) and Dahiyat (2016) found no relationship between financial leverage and financial performance measured by ROA, while according to Ali and Faisal (2020), solvency has a significant impact on profitability. Based on this study, leverage has no impact on performance.

Marozva (2015) stated that the opportunity cost of holding liquid assets is higher returns, while Ehiedu (2014) observed a positive relationship between liquidity as measured by the current ratio and profitability. However, Marozva (2015) and Dahiyat (2016) state that liquidity harms profitability, while Sumani and Roziq (2020) found liquidity has no significant impact on performance. In this study, liquidity harms bank performance, although some researchers got positive relationships and others had no effect on bank performance.

Generally, bank performance is explained by three general theories: market power, financial intermediation, and trade-off theory, were discussed in this chapter and the empirical research section will be discussed in the following chapter.

CHAPTER 3: EMPIRICAL RESEARCH

3 INTRODUCTION

The review of empirical research on the factors influencing commercial bank liquidity and leverage undertaken by several writers is included in this chapter, along with the conclusions. The following part describes an empirical investigation employing quantitative theory analyses based on the findings of several studies on the relationship between bank liquidity, leverage, and bank performance. According to Kanaan and Saoud (2018), profitability is the primary goal that businesses strive for to ensure their viability and continuity. As a result, increasing a company's profitability is dependent on its ability to manage its sources of funds optimally. Companies must maintain acceptable levels of liquidity and strike a balance between internal and external sources of financing to achieve the desired level of performance. Companies should also work to ensure that their operations run smoothly, that money is reinvested in income-generating projects to ensure continuity, and that they maintain a competitive position (Dahiyat, 2016).

Liquidity and solvency are two important aspects of a bank's overall operational management. Liquidity refers to the balance between assets in the form of cash or easily convertible into cash (current assets) and current liabilities, whereas solvency describes the relationship between borrowed funds and owners' funds in a bank's capital structure. It consists of debt and common equity used to finance the bank's total assets, operations, and financial growth (Goel et al., 2015). To meet customer withdrawals and provide funds for growth, all banks must maintain adequate levels of cash, liquid assets, and prospective borrowing lines to meet expected and contingent liquidity demands.

Companies that do not have sufficient liquidity may not be able to meet their short-term obligations to their suppliers or provide services and goods on time, which may affect their reputation and may result in bankruptcy due to the company's inefficiency in managing its assets optimally (Yusoff, 2017). The use of borrowed funds results in what is known as leverage (Aliwi, 2019). Although there are benefits to corporate leverage in terms of tax savings, increasing reliance on external financing sources without efficiency

in their use exposes the company to serious consequences (Kanaan & Saoud, 2018). Financial solvency is also one of the fundamental concepts that industrial firm management is interested in, to assess the company's efficiency in meeting long-term obligations (Owais, 2016).

This study examines the impact of leverage, solvency, and liquidity on profitability to determine which of these factors has the greatest impact on profitability. From this perspective, the significance of this research lies in its conceptual coverage of liquidity, leverage, and solvency, as well as its examination of their impact on profitability.

3.1 CONCEPTUAL FRAMEWORKS

Dependent variable

Independent variable

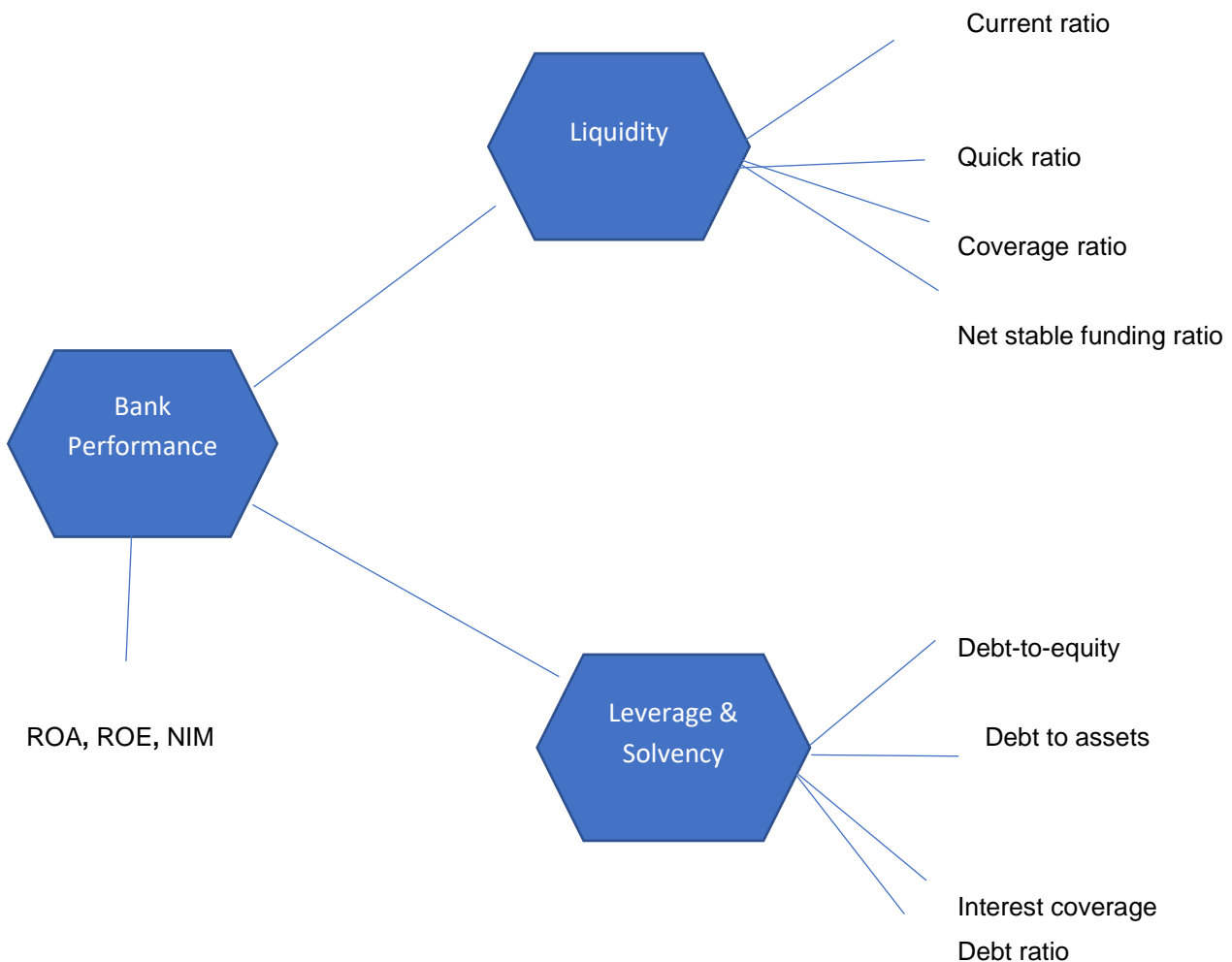


Figure 3.1 Conceptual framework. Source: Own compilation

In the analysis, we discovered a strong and significant relationship between leverage and bank performance (ROA and NIM), whereas findings were negative when NIM and TDR, ROE and leverage (TDR, LTDR, and STDR) were used. The data also demonstrated an adverse correlation between ROA and liquidity, along with a relationship between the Z-score and liquidity.

3.1.1 Conceptualisation model

The study investigates the effects of liquidity and solvency on bank performance. Banking profitability indicates bank performance as well as how capable the bank is of earning income from its assets (Dao & Nguyen, 2020). For a bank to be profitable, both macro and micro (dependent and independent variables) factors must be considered. Liquidity and solvency are critical for the banking industry's long-term survival.

According to Dahiyat (2016), liquidity has a significant negative impact on profitability. Dahiyat (2016) measure the liquidity using a quick ratio whereas the return on assets ratio was applied to assess profitability. In addition, Marozva (2015) stated that liquidity does not appear to increase profitability or decrease performance. Liquidity and bank performance are positively associated according to Otekunrin et al., (2019). Khan and Mutahhar Ali (2016) measured liquidity using the current and quick ratios and discovered a positive relationship between liquidity and profitability.

There is no relationship between financial leverage and financial performance as measured by ROA, according to Ali (2020) and Dahiyat (2016). In contrast, Ali and Faisal (2020) discovered that solvency has a significant impact on profitability, while Nguyen and Nguyen (2020) discovered a positive relationship between solvency and profitability measured by ROA, but a negative relationship between solvency and profitability measured by ROE. On the other hand, Gadzo and Asiamah (2018) evaluated the correlation amongst leverage with bank performance and discovered that the bank performance variables of ROA and ROE had a positive relationship with leverage.

Liquidity is the ability of a company to pay off current liabilities with current assets, whereas solvency is the ability of a company to pay its debts when they become due. Liquidity and solvency played a critical part in managing bank performance both globally and locally, as a result, these variables are ideal for managing bank performance.

3.2 EMPIRICAL LITERATURE ON THE RELATIONSHIP BETWEEN LIQUIDITY AND BANK PERFORMANCE.

Profitability and liquidity as overall performance signs are essential to the full-size stakeholders including shareholders, lenders and evaluation specialists. The shareholders are interested in the profitability of banks as it determines their returns on investment. Depositors are involved with the liquidity function in their banks as it determines the ability to reply to the withdrawal needs, which might be usually on call for or on short notice, as the case may be. The tax authorities are interested in the profitability of banks in order to determine the precise tax obligation (Olagunji et al., 2011).

The nexus between liquidity and bank performance remains contestable. In the analysis of the relationship between liquidity and bank performance, Marozva (2015) argued that even though illiquidity is a major factor in bank failures, holding highly liquid assets is associated with the opportunity cost of higher returns. Therefore, it is not obvious that liquidity may enhance profitability, nor can it depress performance. Muriithi and Waweru (2017) conducted a study on Liquidity Risk and Financial Performance of Commercial Banks in Kenya for the period 2005 to 2014 for 43 registered commercial banks in Kenya. Liquidity risk was measured using liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) while financial performance was by return on equity (ROE). The results showed that NSFR is negatively related to bank profitability both in the long and short run. The liquidity coverage ratio does not significantly influence the financial performance of commercial banks in Kenya both in the long and short run; all else is constant. However, the overall effect was that liquidity risk harms financial performance, confirming that liquidity depresses profitability.

Charmier et al., (2018) used a sample of commercial banks in Ghana from 2007 to 2016 to investigate the impact of liquidity on their performance. Data were analysed using descriptive statistics, and the study utilized the ratio of liquid assets to total assets and the ratio of liquid funds to total assets as measurements. Net interest margin, bank size, capital adequacy, foreign ownership, and profitability were the specific control variables. The results revealed a positive association among liquidity and ROA, but an insignificant negative connection of liquidity and ROE. These results on the other hand support the fact that liquidity enhances profitability. The findings on the nexus between liquidity are contradictory depending on the control variables used and the liquidity proxy used. This study aims to further investigate this phenomenon in South Africa, a country that is structurally and fundamentally different from Ghana and Kenya. Unlike these two countries, South Africa is a relatively new democracy, and the banking sector has been relatively stable throughout the analysis. Moreover, the South African banking sector is dominated by five banks which represent 90% of all total assets of the banking sector (Kasse-Kengne, 2018). This study will investigate the effects of liquidity on bank performance using different proxies for liquidity and performance over a different data set and period.

Malik et al., (2016) investigated the trade-off between liquidity and profitability in Pakistan's private-sector banks. Using the Ordinary Least Squares (OLS) technique, the study was conducted on 22 private-sector banks registered with the State Bank of Pakistan from 2009 to 2013. Return on equity and return on investment were used as proxies for profitability. As a result, there is a negative relationship between the Profitability Ratio and the Liquidity Ratio.

The relationship between liquidity and firm profitability was empirically investigated by collecting data from 50 Karachi Stock Exchange-listed firms in Pakistan for the years 2007 to 2011, panel data were gathered from secondary sources. Firm profitability was measured using net operating income and return on assets. The firm's liquidity was assessed using the current ratio. According to the study, the current ratio has a significant

relationship with return on assets, implying that firms that properly manage their short-term obligations have a positive impact on firm profitability (Bibi & Amjad, 2017).

Furthermore, Otekunrin et al., (2019) investigated the performance of selected quoted deposit money banks in Nigeria, as well as the liquidity management of 17 deposit money banks listed on the Nigerian Stock Exchange (NSE) between 2012 and 2017. The study employed the ordinary least square method (OLS). Capital ratio (CTR), current ratio (CR), and cash ratio (CSR) were proxies for liquidity management, while return on assets (ROA) was a performance proxy (ROA). The study concluded that liquidity management and bank performance are positively related, and that liquidity management is an important factor in business operations; as a result, that leads to business profitability.

Between 2006 and 2015, Nabeel and Hussain (2017) investigated liquidity management and its effects on bank profitability in Pakistan. The study employed correlation, descriptive statistics and regression techniques to analyse secondary data from 10 banks. Quick ratios, current ratios, cash ratios, interest coverage ratios, and capital adequacy ratios were proxies for liquidity management, while returns on assets, returns on equity, and earnings per share were proxies for profitability. The study findings discovered a positive relationship between liquidity management as measured by the interest coverage ratio, capital adequacy ratio, quick ratio and bank profitability, but a negative relationship between liquidity management as measured by the cash ratio and current ratio and bank profitability.

The purpose of the research was to look at the impact of liquidity and solvency on the financial performance of Jordanian manufacturing companies listed on the Amman Stock Exchange over 10 years, from 2010 to 2019. The company's size was used as a control variable. The study measured financial performance using Return on assets (ROA) and Earnings Per Share (EPS). The current ratio (CR) was used as a liquidity proxy. Liquidity has a negligible negative impact on financial performance (Dahiyat et al., 2021).

However, Hristova et al. (2019) conducted a study on the trade-off between liquidity and

profitability in the pharmaceutical sector in the Republic of North Macedonia. According to the findings, liquidity is not a determinant of profitability for RNM pharmaceutical companies. The relationship between ROA, ROE, and CR is negative but insignificant, implying that a rise in liquidity will lead to a minor decline in profitability.

Ehiedu (2014) discovered a significant positive relationship between the current ratio and profitability as measured by return on assets (ROA) and no definite significant correlation between the acid-test ratio and profitability. The research was based on the Financial Statement Analysis (FSA) approach and the influence of Liquidity on Profitability of Some Selected enterprises. In contrast, Kajola et al., (2019) studied the effect of leverage and liquidity on profitability in 17 Nigerian consumer goods companies from 2012 to 2017. As an analytical tool, the pooled Ordinary Least Squares (OLS) technique was used. The study, however, was unable to provide empirical evidence in support of liquidity proxies using the current ratio and quick asset ratio having a significant effect on company performance.

Islatince (2015) investigated the effects of internal factors under the control of deposit banks in Turkey and external factors that reflect the financial system in countries and are beyond the banks' control on profitability of the banks. A multilinear regression analysis of Turkish deposit bank data from 2008 to 2014 was performed for this purpose. As a result, it was discovered that there is a high correlation between bank asset profitability and equity profitability and that micro variables are more effective in determining a bank's performance than macroeconomic variables. It was also discovered that liquidity, as a micro variable, harms equity profitability and that the bank's expense management is the only variable affecting a bank's profitability and equity profitability.

Marozva (2015) used a pattern of South African banks over the length of 1998 to 2014 to investigate the relationship between liquidity risk and bank performance. In this study, bank performance is proxied through the net interest margin. This resulted in a negative and significant association between liquidity risk and bank performance using the Autoregressive Distributed Lag (ARDL)-bound approach and Ordinary Least Squares

(OLS) to examine the nexus between net interest margin and liquidity.

According to Baumol (1952), interest rates are the primary determinants of speculative and precautionary motives for requiring cash, and the relationship is negative. Furthermore, Marozva (2017) found a negative relationship between the new liquidity measures and interest rates because the interbank lending rate represents the opportunity cost of not keeping liquid assets to meet obligations as they become due, as well as failure to issue loans as they are requested.

Luvuno (2018) investigated the factors that determine financial institution performance in South Africa by examining the connection across bank liquidity and bank performance and using GMM for 12 banks from 2006 to 2016. The panel regression method was employed, using panel data from 12 commercial banks obtained around 2006 to 2016. The interaction involving bank liquidity, as well as some microeconomic factors and bank-specific components, along with the correlation involving bank liquidity and certain macroeconomic aspects was investigated using a quantitative research method. The pooled ordinary least squares regression, fixed effects, random effects, and generalised methods of moments were used to conduct the regression analysis for four liquidity ratios. On the other hand, the system-generalized methods of moments technique, were preferable above other approaches since they resolved the endogeneity issue. According to the findings, capital adequacy, size, with GDP all have a substantial positive influence on liquidity, whereas loan growth, nonperforming loans, or even liquidity each have an adverse influence. Finally, inflation has an impact on liquidity in both positive and negative ways.

The goal of the paper was to demonstrate the relative impact of liquidity, leverage, and solvency on the profitability of industrial enterprises listed on the Amman Stock Exchange to determine which of these factors has the greatest impact on profitability. From 2012 to 2018, 44 Jordanian industrial companies were examined to achieve the study's objectives. Return on assets (ROA) and return on equity (ROE) are examined as performance measures, while the current ratio and quick ratio are examined as liquidity

measures. The hypotheses were tested using multiple regression analysis. In particular, the results of the relationship between liquidity and profitability of Jordanian industrial enterprises listed on the Amman Stock Exchange (as measured by ROA and ROE) show that liquidity has no statistically significant influence on profitability, as measured by the current ratio and quick ratio (Ayoush et al., 2021).

Sheefeni and Nyambe (2016) used the autoregressive distributive lag (ARDL) model to examine the liquidity implications in Namibia during 2001 to 2014. The research showed that real GDP is the most crucial factor of commercial bank liquidity in Namibia. It was additionally established that the monetary policy rate is connected to bank liquidity in a favourable way, but quantitatively insignificantly. Although, the outcome revealed an inverse correlation exists between inflation and the liquidity of commercial banks.

Vodova (2016) studied the impact of liquidity on the profitability of the Polish banking industry from 2007 to 2013. Liquidity was measured using liquid-asset ratio, loan-to-deposit ratio and net interbank position and profitability was measured using return on assets, return-on-equity and interest margin ratios. It was found that liquidity harms bank profitability. Ibrahim (2017) examined the influence of liquidity on the profitability of Iraqi banks from 2005 to 2013 and found a significant impact of liquidity on bank profitability. Dahiyat (2016) empirically examined the impact of liquidity on banks' profitability from 2012 to 2014 and found that profitability will be negatively influenced by liquidity, meaning that if the liquidity of the banks measured by quick ratio increased, the profitability of the banks measured by ROA will decrease.

Kalanidis (2016) investigated the impact of liquidity on the profitability of European banks, measured by Return on Average Assets (ROAA), Return on Average Equity (ROAE), Net Interest Margin (NIM) and Profit Before Tax (PBT) from 2009 to 2015 and concluded that liquidity harms profitability. In contrast, the capital ratio, which was used as a proxy for regulatory-imposed liquidity, was positively related. However, there were some differences in the results for NIM, with Cash from Banks and Net Loans to Total Assets being positively related to profitability, while the capital ratio to Total Assets was

negatively related to NIM. According to the study's findings, banks should maintain their liquidity levels primarily through capital reserves and take actions to mitigate the credit risk of their investments, as well as their financing gap, which imposes constraints on their funding procedure.

Khan and Mutahhar Ali (2016) asserted that there is a positive relationship between liquidity and profitability. The current ratio and quick ratio were considered measures of liquidity, while the gross profit margin and net profit margin ratios were considered measures of profitability. The information was derived from HABIB Bank Limited's annual accounts from 2008 to 2014.

Nabeel and Hussain (2017) investigated the impact of liquidity management on profitability in Pakistan's banking sector from 2006 to 2015. According to the findings of the study, the quick ratio has a positive relationship with profitability, whereas the current ratio has a negative relationship with return on assets. The overall findings demonstrate that liquidity management has a positive relationship with bank profitability.

The purpose of the research was to investigate the relationship between financial market development and foreign portfolio investment inflows in Nigeria. The Autoregressive Distributive Lag (ARDL) technique was used to investigate the relationships between stock market development, turnover ratio, total new issues, and foreign portfolio investment. The study investigated whether there is a long-run and short-run causal relationship between financial market performance and foreign portfolio investment in Nigeria. Stock market performance, stock market liquidity, and total new issues were used to gauge financial market performance. The study's data came from the CBN statistical bulletin, which was published from 1984 to 2015. The Autoregressive Distributive Lag (ARDL) technique was used to analyse the data in this study. According to the findings of the analyses, there is no long-run causal relationship between financial market performance and foreign portfolio investment in Nigeria. Furthermore, there is no short-run causal relationship between stock market performance and stock market liquidity and foreign portfolio investment in Nigeria. Finally, the total new issue has a causal

relationship with foreign portfolio investment in Nigeria in the short run. Based on these findings, the study recommends that stock market regulators encourage more domestic participation in the market through conscious enlightenment campaigns to improve market performance, depth, and growth, as this will strengthen its long-run causality with FPI (Adebisi & Arikpo, 2017).

The findings of the literature review were inconclusive because different researchers utilised different liquidity and solvency measurements. Various metrics yield different outcomes, particularly when it comes to liquidity. Liquidity harms bank performance as assessed by ROE, ROA, and NIM, according to most researchers who utilised the current ratio as an indicator of liquidity (Dahiyat et al., 2021; Hristova et al., 2019; Marozva, 2017; Luvuno, 2018). On the contrary, Bibi and Amjad's (2017), Otekunrin et al., (2019) and Nabeel and Hussain's (2017) studies discovered a positive association between liquidity and profitability when they measured liquidity using the interest coverage ratio, capital adequacy ratio, and quick ratio.

Liquidity harms profitability because when a company or financial organisation makes a profit, it could be because they kept a little money in their account. As a result, this study concludes that liquidity harms profitability, while the LCR's limitation is that it requires banks to hold more cash, which may result in fewer loans issued to consumers and businesses, slowing economic growth. Another limitation is that it will not be known until the next financial crisis whether the LCR provides banks with a sufficient financial cushion to survive before governments and central banks intervene (Murphy, 2021). Therefore, there is a gap in liquidity in terms of NSFR and LCR.

In line with the objective of the Basel III LCR framework, the Prudential Authority (PA) has decided to change the minimum liquidity coverage ratio (LCR) standards to provide temporary liquidity relief to banks (Resbank, 2020). The LCR requirement was cut from 100 per cent to 80 per cent to alleviate the banking sector's possible liquidity strain, support the local economy (South African Economy), and ensure financial stability (Resbank, 2021).

Table 3.1: Synthesis of selected liquidity and bank performance empirical studies

Authors (year)	Study period	Countries of focus	Key variables	Methodology	Results
Luvuno (2018)	2006 - 2016	South Africa	GDP, Loan growth, Inflation.		GDP has positive and significant effects. Loan growth has negative and significant effects, Inflation has both positive and negative effects on liquidity.
Ayoush, Toumeh & Shabaneh (2021)	2012 - 2018	Jordan	the current ratio and a quick ratio		Liquidity does not affect profitability.
Marozva (2015)	1998-2014	South African	market liquidity risk and funding liquidity risk	ARDL & OLS	negative significant
Sheefeni & Nyambe (2016)	2001 -2014	Namibia	GDP, Inflation	ARDL	GDP is positively related, and Inflation is negatively related.
Adebisi & Arikpo, 2017	1984 - 2015	Nigeria	FPI, stock market performance, stock market liquidity	ARDL	No short-run causality was established between stock market performance and stock market liquidity.

Source: Author's compilation

3.3 EMPIRICAL LITERATURE ON THE RELATIONSHIP BETWEEN LEVERAGE/ SOLVENCY AND BANK PERFORMANCE.

Myers and Majluf (1984) developed the famous solvency management theory, which suggests a negative relationship between solvency and performance. Researchers have different views based on the variable used. Andersson and Minnema (2018) investigated the capital structure and profitability of 130 Swedish management consulting firms from 2012 to 2016 by examining the relationship between leverage and profitability. Leverage is composed primarily of total debt-to-assets, but also of short-term and long-term debt-to-assets, while profitability was measured by return on assets (ROA). The findings revealed a negative, linear, and significant relationship between leverage and profitability for Swedish management consulting firms. Both short-term and long-term debt has a negative relationship with profitability.

Dahiyat (2016) examined the impact of liquidity and solvency on the bank profitability of Jordan's listed banks from 2012 to 2014. The debt ratio was used as a measure of solvency in the study and return on assets (ROA) was used as a proxy for bank performance. The study concluded that solvency as measured by debt ratio has no significant impact on bank profitability.

Ahmad et al., (2015) conducted a study on the impact of financial leverage on firms' profitability in the cement sector operating in Pakistan using ROA as a measure of profitability and financial leverage as a ratio of long-term debt to total assets. The results revealed that there is a significant negative relationship between financial leverage and firm profitability. There is a negative relationship between solvency and profitability, which contradicts the notion that less profitable firms wait longer to pay day-to-day expenses. The debt-to-equity ratio was used to assess solvency, while the ROA and ROE ratios were used to assess bank performance (Khidmat & Rehman, 2014).

Abor (2007a) conducted a cross-country study in Ghana and South Africa to investigate

the relationship between leverage and the financial performance of small and medium-sized enterprises (SMEs). The study concluded that leverage has a positive influence on financial performance using debt policy and a panel data analysis, while according to Pattitoni et al. (2014), the greater the use of debt, the lower the return on equity. As businesses accumulate more debt, they must pay out more interest expense, resulting in cash constraints due to periodic debt payments, before experiencing financial difficulties and a decline in operating performance. As determined by Pattitoni et al. (2014), financial leverage harms profitability.

Profitability benefits from solvency. According to Alshatti (2015) research findings, the solvency ratio has a positive impact on profitability. This is because the higher the solvency, the greater the level of financial stability that enterprises can achieve, assisting enterprises with financial independence and financial security improvement. As a result, the enterprise would be able to improve productivity and efficiency, thereby achieving the goal of increased profitability. This contrasts with the findings of Gatsi et al., (2016) who found a negative relationship between leverage and bank performance, concentrated on listed banks, which are much more regulated than unlisted banks.

Gadzo and Asiamah (2018) investigated the relationship between leverage and unlisted financial institution achievement in Ghana since 2006 through 2016. Data were analysed using fixed-effect panel regression. ROA, ROE, and rate of profit were used to assess bank performance, while leverage was assessed using the short-term debt ratio (STD) and long-term debt ratio (LTD). According to the study's findings, unlisted banks in Ghana are highly leveraged, with a higher debt-to-equity ratio. The findings also show that the level of gearing for unlisted banks has a positive relationship with the bank performance variables of return on asset, return on equity, and rate of profit, while Mburu's (2015) study looked at the impact of solvency on the performance of Kenyan commercial banks. The findings revealed that bank solvency had a negative but insignificant impact on performance. It is concluded that bank solvency levels do not influence bank performance in Kenya.

Nguyen and Nguyen (2020) investigated the determinants of the financial performance of

Vietnamese companies from 2014 to 2017, finding a positive relationship between solvency and profitability measured by ROA but a negative impact when profitability was measured by ROE, while Yameen and Pervez (2016) found no significant impact on Solvency and Profitability, measured solvency with debt-equity ratio and profitability with ROA and ROE on the organization achievement of Steel Authority of India Limited from 2005 to 2014.

Alshatti (2015) investigated the relationship between solvency and profitability in 13 Jordanian commercial banks over eight years from 2005 to 2012. According to the findings, the quick solvency ratio and investment ratio have a positive impact on bank profitability, whereas the equity ratio and instant solvency ratio have a negative impact. Al-Nimer et al. (2013) studied the impact of solvency on Jordanian industrial sectors. In this study, solvency was expressed by debt ratio (Debt) and equity ratio (Equity), and profitability was expressed by variables such as earnings before interest and tax (EBIT), net profit margin (NPM), return on asset (ROA), and return on equity (ROE), and the multiple regressions covered a period from 2008 to 2011. As per the study, the Mining and Extraction sector and the Glass and Ceramic Industries had the highest and lowest EBIT, NPM, ROA, and ROE, respectively. According to the findings of the study, firm solvency has a significant relationship with firm profitability.

A study was conducted to investigate the effect of working capital management on the profitability and market valuation of Pakistani firms. According to Alam et al., (2011), there is a positive relationship between total debt to total assets and profitability. The relationship between capital structure and performance was investigated by Nosa and Ose (2010) and their study was conducted over 15 years. Analytical statistical tools were used, and the authors concluded that capital structure and performance have a negative relationship. In contrast, Abu Mouam's (2011) and Al-Omari (2020) study concluded that profitability, as measured by ROA (return on assets), has a positive relationship with solvency, as measured by the (DE) Debt/ Equity ratio.

Ali et al., (2021) study was conducted on the data of nine petroleum and energy sectors

of Pakistani companies for 10 years to explain the relationship between liquidity, solvency, and performance, which plays a vital role in the return on assets of the petroleum and energy sector in Pakistan (2001 to 2011). According to the findings of this study, there is a negative relationship between solvency and profitability. ROA and ROE were used to determine profitability, and the debt-to-equity ratio was used to determine solvency.

In contrast, Gweji and Karanja (2014) investigated the impact of financial leverage on the performance of a deposit-taking savings and credit co-operative in Kenya. The study relied on secondary data derived from the financial statements of 40 savings and credit cooperative societies sampled for the study between 2000 and 2012. Descriptive and analytical designs were both used. The results show a perfect positive correlation between financial leverage as measured by the debt-equity ratio and performance measured by ROE.

Innocent et al., (2014) conducted a study on the effect of financial leverage on financial performance: evidence from Nigerian-listed pharmaceutical companies from 2001 to 2012. Financial leverage, as measured by debt ratio (DR), debt-equity ratio (DER), and interest coverage ratio (ICR) was applied as an independent variable, while ROA was imposed as a proxy for banking performance. According to the data, debt ratio and debt-equity ratio have a negative association with ROA in the Nigerian pharmaceutical industry, whereas interest coverage ratio has a positive relationship with ROA. The study also revealed that aggregate financial leverage variables have no significant effect on the financial performance of the companies studied.

Onaolapo and Kajola (2010) examined the impact of capital structure on the financial performance of companies listed on the Nigerian Stock Exchange. This study was conducted over seven years from 2001 to 2007. Among the sampled firms, debt leverage (debt ratio) adversely impacts financial performance (ROA and ROE).

According to Nedunchezian and Premalatha (2015), the purpose of the research is to learn more about the relationship between liquidity and profitability in Indian private-sector

banks. The study included five of the 20 new private-sector banks. The descriptive nature of the study was used to collect secondary data for the study. The time series analysis and regression on profitability ratio were used to determine the relevant liquidity and profitability of privately selected banks' financial reports. As a result, there is no significant relationship between ROA and cash and bank balances concerning total liabilities. There is no statistically significant relationship between ROE with loans and advances to total assets, and cash and bank advance to total liabilities.

A previous study has found that depending on the debt ratio utilised, leverage has varying relationships with profitability. For example, Ali et al., (2021) measured solvency using the debt-to-equity ratio, and the results were negative for bank performance. Dahiyat (2016), on the other hand, measured solvency by debt ratio and found that Efficiencies of banks were not significantly affected. In the theory of pecking order, according to Myers and Majluf (1984), opposing relationships are predicted. In theory, companies will only take on debt if their internal reserves are insufficient to meet their needs. As a result, more profitable firms will have a lower debt level, implying that total debt and profitability have a negative relationship. According to Modigliani and Miller (1963), more profitable firms should have higher levels of total debt in theory, implying that there should be a positive relationship between total debt and profitability. Alshatti (2015) and Al-Omari (2020) discovered that the solvency ratio has a positive impact on profitability.

Because of the gaps in previous empirical findings and theoretical distinctions for predicting the relationship between total debt and profitability, it is natural to investigate whether such a relationship exists and how it compares to previously mentioned theories. Total debt to assets was the main variable used to answer the study question. Short-term and long-term debt to assets will be considered to address other aspects of leverage relevant to this study.

According to Munangi and Sibindi's (2020) research, bank leverage and financial performance are negatively related in South African banks. South Africa has experienced low economic growth, which raises credit risks and reduces bank profitability. High unemployment rates in developing countries contribute to the inability to repay debt.

3.4 OTHER DETERMINANTS OF BANK PERFORMANCE

3.4.1 Financial intermediary theory

Macro-economic determinants of bank performance

(i) Economic Growth (GDP growth)

Mohanty and Sarkar (2020) investigated the impact of bank-specific and external factors on the profitability of PSU banks in India and discovered that GDP growth harms profitability, while Dinson (2017) explored the CIMB Bank Performance relationship between GDP, Leverage Ratio and Operating Efficiency Ratio to Profitability from 2011 to 2015 and found that the Resultant performance of CIMB Banks' influence on GDP on profitability was favourable and exceptional.

(ii) Interest rates

Interest rates are the most crucial macroeconomic factors that determine growth in the economy. Moreover, in order to perform financially effectively, a bank's interest rate is of utmost importance. Crowley (2007) defined "interest rate" as the cost that a borrower pays for the use of borrowed funds from a financial institution, or even the payment made on borrowed assets. In the study of bank-specific and macroeconomic factors of commercial bank profitability in Turkey from 2002 to 2010, Alper and Anbar (2011) discovered that an increase in the real interest rate led to an increase in commercial bank profitability in Turkey.

The interest rate can be a factor in people's decisions to spend or save money, as well as businesses' decisions to issue loans for a variety of reasons. When interest rates are low, more companies are prepared to borrow money to develop their operations, resulting in higher stock values (Huang et al., 2016). The central bank's raise in interest rates attracts foreign investment and raises the local currency's value (Mahvish, 2017).

(iii) Exchange rates

The exchange rate, according to Isaac (2015), is an unexpected exchange rate fluctuation that affects the bank market value. A key component of monetary economy is the borrowing of foreign currencies, particularly in emerging markets like South Africa. Exchange rate fluctuations have a significant impact on bank performance according to Lambe (2015) and according to Yeboah and Takacs (2019), there is uncertainty as to the impact of exchange rate fluctuation on the profitability of companies in South Africa. In accordance with studies in the banking industry, exchange rate fluctuations have a significant negative impact on profitability (Ahmed, 2015).

(iv) Inflation

According to Haryono et al., (2016), inflation is defined as a sustained increase in the overall price of goods and services in a specific economy over a given period. The rate of inflation is expected to have a positive effect on bank profitability (Al-Homaidi et al., 2018). According to Kana (2017), a high inflation rate is associated with both higher costs and higher income. Inflation is expected to have a positive effect on profitability if a bank's income rises faster than its costs. A negative coefficient, on the contrary side, is to be anticipated when expenditures exceed revenue. Abiola and Adebisi (2021) suggested that the government reduce inflation to improve the financial performance of listed deposit money banks, as well as the national economy.

(v) Employment

Researchers are increasingly interested in the unemployment rate when measuring the financial performance of banking organisations. The unemployment rate has been shown to harm financial performance in studies (Baba & Nasieku, 2016). Dewi et al., (2019) evaluated the negligible impact of recession on performance. The level of unemployment is linked to the performance of banks. When unemployment rises, bank performance suffers as fewer people choose to cooperate with banks, resulting in fewer bank accounts and services, as well as an increase in nonperforming loans (NPLs). With a rising unemployment rate, more people would struggle to pay their debts, resulting in a rise in

nonperforming loans (NPLs). According to the reasoning presented above, it has a direct association around unemployed with loan issues (Kurumi & Bushpepa, 2017).

3.4.2 Micro-economic determinants of bank performance

(i) Loan performance (non-performing loans)/ credit risk

The ability of investors to exploit desired successful projects is enhanced by banks' credit function. The primary source of revenue for banks is credit generation (Kargi, 2011). However, this puts banks in danger of default. According to the research by Kargi (2011) on Nigerian banks, it was established that the amounts of loans and advances, non-performing loans, and deposits have an inverse relationship with bank profitability, exposing firms at risk of financial distress, while Kithinji's (2010) data revealed that most commercial banks' profits in Kenya are unaffected by credit and non-performing loans. Mohanty and Sarkar's (2020) finding suggests that a higher ratio of nonperforming loans may result in a deterioration of credit portfolio quality, which harms commercial bank profitability.

When banks extend credit, there is uncertainty about the outcome in terms of returns. Banks that take risks are well compensated when borrowers do not default (Munangi & Sibindi, 2020), while according to Khemraj and Pasha (2013), banks that experience more losses have a higher risk appetite. Munangi and Sibindi (2020) conducted a study on the impact of credit risk on the financial performance of South African banks. Creditworthiness were proven to be negatively associated with financial results according to the study's findings, while Alshatti (2015) investigated the impact of credit risk management on Jordanian commercial banks' financial performance and discovered a positive correlation between nonperforming loans and bank financial performance. Further credit risk indicators of non-performing loans have a positive relationship with bank financial performance according to Boahene et al., (2012). In addition, according to Li and Zou (2014), the indicator of nonperforming loans has a positive impact on bank profitability as measured by return on equity (ROE) and return on assets (ROA). Existing research by Al-shakrchy (2017) and Seemule et al., (2017) supports a negative relationship between credit risk and profitability.

Dhar and Bakshi (2015) investigated the variables which impacted the variance of non-performing loans in the public sector of Indian banks from 2001 to 2005. According to the findings, net interest margin (NIM) and capital adequacy ratio (CAR) have a negligible negative relationship with a non-personal loan (NPL).

Kumar et al., (2016) investigated the determinants of non-performing loans (NPL) in the Fiji financial industry for the period 2000 to 2013. The findings show a significant positive relationship between NPL and ROE/ NIM.

(ii) Bank size

Aladwan (2015) explored the effect of bank size on profitability for Jordanian listed commercial banks during and after the financial crisis in 2007 till 2009. The analysis used return on equity (ROE) as a relying component to quantify revenue, and financial institutions had categorised based on the size of their total assets. Profitability grows as bank size decreases but decreases as bank size increases. Smaller and medium-sized banks expected to outperform larger banks in terms of profits, based on results.

Alex and Ngaba (2018) investigated an impact of bank size on financial results of Kenyan financial institutions from 2012 to 2016. The financial firms were divided into three groups: modest, moderate, and enormous. According to the findings, large to medium banks have a higher return on assets (ROA) than small banks. As a result, the research discovered a direct link between bank size and performance in Kenya.

(iii) Management quality

Gross profit /total assets

Munir and Bustamam (2017) used the cost-to-income ratio to measure management efficiency and found that it had a negative insignificant influence on bank performance in Malaysia and Indonesia. Chowdhury and Rasid (2017) obtained similar results when examining management efficiency using the net interest expense to total assets ratio. In addition, Sathyamoorthi et al., (2017) also found managerial efficiency had no significant relationship with banks' performance on listed commercial banks in Botswana for the period 2011 to 2015.

Using data from sixteen (16) universal banks in Ghana, this study examines the impact of financial intermediation on bank performance. Annual time series data from 1996 to 2018 were used in the study. Regression with several variables. The findings reveal that the operational cost, reserve, and bank borrowing rate all had a substantial influences bank profitability in Ghana. The rise in operational costs would boost bank efficiency, while a lower reserve would boost performance and a higher borrowing rate would boost profits. The findings of the study show that operating costs and reserves have a substantial association with bank solvency index performance. The reserve has a positive relationship; however, the operating cost has a negative association. Banks are compelled to invest more funds in loan management (Garr, 2021).

Akoto and Nabieu (2014) study investigates the extent to which Ghanaian banks have performed their financial intermediation function and the implications for profitability. Secondary data obtained from the headquarters of Ghana's eight largest banks was obtained from their financial reports from 2004 to 2010. Using the descriptive examination technique, it is discovered that all of the banks performed creditably well during the study period, with private banks outperforming state-owned banks. Banks that mobilised the most deposits were also the ones that recorded the most loans and advances on average. Furthermore, it was discovered that banks that made the most loans and advances did not necessarily make the most profits.

The study investigates the extent to which Nigerian banks have performed their intermediation functions of deposit mobilisation and loan and advance granting, as well as the effects on their performance. The study makes use of secondary data obtained from the annual reports and accounts of seven banks chosen at random from among the 24 existing banks from 2006 to 2011. The research employs descriptive statistics such as trend analysis, percentage growth, and averages. Despite various socio-cultural and institutional issues impeding Nigeria's financial sector development, banks perform admirably in deposit mobilisation as well as loan and advance granting. The study's findings confirm that banks with high deposits and loans outperform banks with low deposits and loans in terms of profitability (Obamuyi, 2013).

During the period 2010 to 2016, Bank BTN as a state-owned savings bank in Indonesia performed optimally in terms of financial intermediation. The loan-to-deposit ratio (LDR) was high when compared to national banking and other state-owned banks. However, the increase in LDR is not accompanied by an increase in profitability. The low profitability was allegedly caused by the implementation of less efficient financial intermediation due to credit growth, fund structure, and credit risk. The study's goal was to examine the factors that influence financial intermediation efficiencies, such as credit growth (CG), fund structure, and credit risk. And the impact on profitability. Net interest margin (NIM) measures the efficiency of financial intermediation, while ratio time measures the structure of funds (Buchory, 2017).

According to Jreisat and Bawazir (2021), bank profitability tends to correlate with economic activity. Slower growth prospects may reduce bank profitability by reducing lending activity and potentially increasing credit impairments. This study identified the determinants of bank profitability in the Middle East and North Africa (MENA) region. This study examined secondary data from 10 countries, as well as 927 observations from 2008 to 2016. The random-effect model was used to assess the impact of several significant factors on bank profitability. As a result, non-interest income (NII) had a significant positive impact on profitability. Essentially, increases in bank NII (e.g., commission and credit card fee) had a positive impact on bank financial performance.

Junaeni's (2021) goal of the study was to examine the impact of credit risk, liquidity risk, and bank capital on profitability. The Non-Performing Loan (NPL) Ratio was used to measure credit risk, the Loan to Funding Ratio (LFR) was applied to derive liquidity risk, and the Capital Adequacy Ratio was utilized to assess bank capital (CAR). In this study, the sample consisted of the 10 largest banks in Indonesia in terms of total assets. The panel data regression with fixed effects analysis technique was used in this study. This study's data was processed using the Views 10 program. The partial test results show that credit risk and bank capital have an impact on profitability as measured by Return on assets (ROA). Credit risk have a significant and negative influence on profitability. Furthermore, bank capital has a significant positive impact on profitability. Meanwhile,

liquidity risk has no significant impact on profitability.

Chelangat et al., (2022) study discovered that the value of debit cards on ATMs had a significant impact on the financial performance of Kenyan commercial banks. The value of credit cards and all cards on POS machines had a minor impact on commercial banks' financial performance. The findings revealed a negative relationship between the value of prepaid cards on ATMs and the financial performance of Kenyan commercial banks, indicating that the use of prepaid cards on ATMs is unlikely to affect the financial performance of Kenyan commercial banks.

Liquidity refers to a bank's ability to provide sufficient funds to fulfil all duties and commitments to customers when needed. An approach known as CAMEL was used to assess the level of bank health (banking soundness) (Capital adequacy, Asset quality, Management, Earnings, and Liquidity). The emphasis in this context is on liquidity, which is represented by the Loan-to-Deposit Ratio (LDR). Banks may overextend themselves if they lend too much of their deposits, especially during a recession. However, if banks lend too few of their deposits, they may incur opportunity costs because their deposits are sitting on their balance sheets earning no revenue. Banks with low LTD ratios may have lower interest income, which leads to lower earnings. LDR has been shown in empirical studies to have a positive effect on return on assets (Zaineldeen, 2018).

In addition, a bank with a high level of non-performing loans (NPLs) that exceeds the Bank of Indonesia's standard will quickly lose profitability. A high level of NPL is associated with poor credit quality. This situation illustrates a high level of credit risk. A bank that suffers a significant loss in its operational activity will have low earnings (Atahau & Cronje, 2019).

The purpose of the study was to conduct an empirical test of the effect of bad credit and liquidity on bank performance as measured by capital adequacy. From 2011 to 2019, the study focused on banking institutions listed on the Indonesian Stock Exchange. According to the findings of this study, bad credit and liquidity have both direct and indirect effects

on bank performance. Bad credit harms bank performance while liquidity has a positive effect on capital adequacy. In addition, liquidity has a positive effect on bank performance while bad credit harms capital adequacy. Furthermore, capital adequacy has a positive effect on bank performance. Based on these findings, it is concluded that a high level of bad credit is associated with a high level of potential loss for the bank. On the other hand, bad credit and liquidity have a multiplier effect on the improvement of bank performance. Bad credit and liquidity can interact, and this interaction improves bank performance (Suyanto, 2021).

The research aims to examine the impact of banking industry soundness at Indonesia based on Bank Indonesia's implementation guide for bank regulation in Indonesia on bank health assessment. These assessments, in general, cover risks, good corporate governance (GCG), earnings, and capital. Commercial bank performance is measured based on credit growth and profit growth. The population of the study will be 45 commercial banks listed on the Indonesian Stock Exchange, which will be analysed using the structural equation modelling program – partial least squares (SEM-PLS). Credit risk, GCG, and earnings do not affect bank performance in Indonesia, according to the findings. Market risk, liquidity risk, and capital all harm the performance of Indonesian commercial banks. The inquiry is anticipated to influence organizations that make policy for the central bank and commercial banks efforts to improve their performance. (Subhan, 2021).

Jeffrey and Mustafa (2021) believe that the core function of deposit money banks is solely the efficient management of their risk portfolio investments to maximise shareholder wealth by ensuring safety, returns on depositors' funds, and system confidence. The study looked at the effects of financial risks on the performance of Nigerian deposit money banks. Changes in financial performance were specifically examined in terms of the relative impact of credit risk, liquidity risk, market risk, operational risk, and bank size. For 19 years, the study specifically focused on 18 deposit money banks listed on the floor of the Nigerian Stock Exchange. Both statistical and econometric techniques were used in the analysis of the data used in the study. The specified model was estimated using the

panel data analysis technique. In the empirical analysis, the fixed effects were chosen as the best-performing effect in the relationships. The study's findings revealed that the combined effects of financial risks have no negative impact on bank performance. More specifically, the empirical analysis revealed that the financial risk proxy of leverage does not have significant relationship with the financial gain of Nigerian deposit money banks.

The paper examines the impact of commercial bank regulations, specifically price, product, and geographic regulations, on the intermediation function of Nigerian commercial banks. The study employs the Autoregressive Distributive Lag (ARDL) model and the Granger causality framework on secondary data from the Central Bank of Nigeria (CBN) and the World Bank from 1986 to 2017. This demonstrates a long-run relationship between commercial bank regulation and the intermediation function represented by private sector credit to RGDP (regional gross domestic product). It also discovers that commercial banks' price, product, and geographic regulation have a positive relationship with the intermediation function. Additionally, the long-run relationship between commercial bank regulation and the intermediation function described by private sector credit to RGDP is confirmed (Ananwude et al., 2021).

Pamungkas et al., (2021) study analysed the results of bank-level factors on bank performance, such as non-performing assets, capital adequacy, and insolvency risk. A quantitative method with panel data regression was applied to this investigation. These data were extracted from the annual financial statements of Indonesian state-owned commercial banks and private commercial banks from 2015 to 2019 using a purposive sampling method with a total sample of 470 observations. The study findings indicated that non-performing assets (NPA) have a significant negative impact on bank performance. The inadequacy of capital has a significant negative impact on bank performance. Insolvency risk for a bank means that it will be unable to repay its depositors because its liabilities exceed its assets; as a result, it has a significant impact on bank performance. This study is expected to assist banks in understanding how to manage risks and maintain performance as control variables in the study size and age of the bank are used, and Z-Score was used for credit risk and insolvency risk. It was discovered that

a higher Z-Score value indicates that the bank is in better health. The findings of this study confirm that bank health has a positive impact on bank performance. As a result, the higher the ROE, ROA, and NIM generated, the healthier the bank.

(iv) Asset quality

Asset quality (AQ) is a bank-specific internal factor expressed as a percentage of total loans divided by total assets. A positive AQ effect could mean that loan yields net of losses are higher than those of other assets like liquid assets. (Nalianya & Miroga, 2020). It is expected that as Earning Assets Quality improves, so will bank performance (especially profit achievement). The bank's profit will rise as the quality of its earning assets improves (Guasmin, 2022). The study investigated the impact of bank asset quality and performance in Nigeria. According to the findings, there is a correlation between bank asset quality and performance (Abata, 2014). The level of Non-Performing Assets determines the asset quality of banks.

(v) Technology

FinTech firms in Indonesia demonstrate that the growth of FinTech firms harms bank performance (Phan et al., 2018). Akhisar et al., (2015) state that technology-based products provide opportunities for significant cost savings, increased profitability, and lower risk than traditional banking products.

Chipeta and Muthinj (2018) and Sujud and Hashem (2017) investigated the impact of electronic banking services on banking profitability and demonstrated that internet banking, mobile banking, and Automated Teller Machines (ATMs) are assumed to be able to improve commercial bank performance because they can increase banking efficiency, effectiveness, and productivity.

3.4.3 INDUSTRY-SPECIFIC DETERMINANTS OF BANK PERFORMANCE

(i) Industry concentration

The term "industrial concentration" refers to the dominance of a certain industry by a few key companies that specialise in it (Ozhan, 2015). According to Sufian (2011), industry concentration has a positive impact on banking performance, resulting in higher profit margins for banks. In the investigation of commercial banks in Bangladesh, Mosharrafa and Islam (2021) found that the industry concentration measure was significantly inversely associated with bank profitability (ROA) and positively correlated with ROE.

(ii) Stage of industry development

A "marketplace without limits" has been developed as a result of the expansion of unexpected actors in the financial services sector. To challenge the status quo and continuously improve the state of financial services in South Africa, non-traditional players are actively pursuing new opportunities (PWC,2022). An industrial life cycle shows the various stages at which enterprises function, advance, and decline within a certain industry. The five stages of an industrial life cycle include startup, growth, shakeout, maturity, and decline. These phases can persist for varying lengths of time; some can be months long, while others can be years long (CFI, 2022). PWC (2022) states that traditional banks in South Africa are investing a lot in digital transformation as a response to the growing digital disruption. This is a component of their plans to promote customer-centricity through specialised goods and enhanced onboarding tools or channels, to operate more cost-efficiently through the elimination or replacement of fundamental systems, and to provide better risk management.

(iii) Market structure

The competitive behaviour of banks is influenced by market structure, which has an impact on bank profitability (Al-Mosharrafa, 2021). Perfect competition, monopolistic competition, oligopoly, and monopoly are the four forms of market systems (Zeder, 2020). South African banks compete in monopolistically competitive markets (Simatele,

2015). In the South African banking industry, studies by Mlambo and Ncube (2011) and Simbanagevi et al. (2014) support monopolistic competition.

3.4.4 MARKET POWER THEORY

According to Belkhaoui et al., (2014), a market power theory suggests that market structure and strategic bank decision are two factors that influence bank performance. The first is based on market power theory, which states that market structure influences bank performance. The second refers to strategic management theory, which views bank strategic choice as a predictor of bank performance. According to the findings, the overall effect of market structure on bank performance could be direct or indirect. All dimensions of strategic choice (risk-taking strategy, cost leadership strategy, and diversification strategy) have a significant indirect effect on bank market share according to the findings. As a result, the strategic decision influences bank performance indirectly through market share.

Delis et al., (2017) investigated the relationship between bank market power and firm performance both before and after loan origination, examining 25 236 syndicated loan facilities granted by 296 banks to 9 029 non-financial firms in the United States between 2000 and 2010. They discovered that firms with relatively poor performance are matched with banks with significant market power and further discovered a direct and positive effect of bank market power on firm profitability.

During the period from 2003 to 2015, the banking markets in the USA and Canada experienced the Global Financial Crisis (GFC) and numerous other changes. Using stochastic frontier analysis, this study compares the impact of changing market concentration and power on the efficiency of the major banks in both Canada and the United States. Market power had a positive impact on bank efficiency, while market concentration had a negative impact. To achieve an optimal level of performance, market power is used to reduce the cost of funds while increasing the price of loans. Instead of raising the prices of their products and services, researchers recommend that banks find

innovative ways to use their market power for better management and optimal resource utilisation (U-Din et al., 2018).

Seelanatha (2010) investigated the main structural and performance features of the banking industry in Sri Lanka. The study employed four hypotheses proposed by Berger and Hannan (1997), as well as two performance measures, ROA (profitability) and NIM. Both the market power hypothesis and the structure conduct performance hypothesis are contradicted by empirical findings. During the period from 1977 to 2005, financial services reforms, advancements in information and communication technologies (ICT), and industry globalisation drastically altered the market structure of the banking industry in Sri Lanka. The study findings indicate that traditionally, the bank has not held on to the structure conduct performance argument in Sri Lanka, and that bank performance is determined by the level of competition rather than market concentration or market power of individual firms.

The research looks at the relationship between bank competition performance and risk-taking behaviour concerning the effects of bank size and the recent global financial crisis. For the period from 2000 to 2015, the analysis employs dynamic panel data from 1137 BRICS banks (Brazil, Russia, India, China, and South Africa). The findings will have far-reaching policy implications for the BRICS emerging economies. For starters, greater market power promotes bank profitability and financial stability while also exacerbating regional inefficiency. Furthermore, policymakers should foster both cost and revenue efficiency for large banks as these are less efficient than small banks in concentrated markets, even though these banks generate risk. As a result, they must exercise caution to keep the balance of non-performing loans as low as possible while maintaining financial and operational stability (Moudud-UI-Huq, 2020).

Kouki and Al-Nasser (2017) investigated the impact of market power on bank efficiency and stability in Africa. Their findings show that greater market power is associated with greater efficiency and profitability. Banks with greater market power can command higher prices and thus increase their profits. Furthermore, according to Kouki and Al-Nasser

(2017), there is a positive U-shaped relationship between market power and performance. This finding implies that banks with greater market power can increase their profitability and efficiency. The positive result implies that bank returns increase as market power in the region grows. These findings are consistent with the assertion that a higher degree of market power allows banks to control price and supply.

In contrast, Zhang et al., (2013) investigate the relationship between market concentration, risk-taking, and bank performance using a unique dataset of BRICS banks from 2003 to 2010. Researchers discovered a negative relationship between market concentration and performance. With market power, BRICS banks tend to relax their efforts and reap the "monopoly profit" of a "quiet life". These banks may also become inefficient due to the pursuit of goals other than profit maximisation, the costs of gaining and maintaining market power, and the costs of retaining incompetent managers (Berger & Hannan, 1998).

Minha et al., (2020) examined the impact of market power on bank financial stability using bank-level data from 24 Vietnamese banks from 2008 to 2017. Researchers computed the separated Lerner index by fixed effect model, random effect model, and Z-score as a measure of financial stability to assess the degree of market power in the Vietnam banking sector. Further, they estimated the relationship between market power and financial stability using static and dynamic panel data regression methods. The findings indicate that the two indicators Lerner F and Lerner R harmed ROA and ROE. The outcome is consistent with the "competitive-stability" view for Vietnamese commercial banks; thus, reduced market power will boost Vietnamese commercial banks' financial stability.

The structure-conduct-performance paradigm has three hypotheses: the traditional hypothesis, the differentiation hypothesis, and the efficiency hypothesis. The goal of this study is to determine how powerful market structure is in influencing banking performance. Using the Weiss model, this study employs the fixed effect model. This study also attempts to demonstrate whether market share and concentration in the

banking industry can be used to predict efficiency. The traditional hypothesis is strongly rejected by the results of a panel data analysis conducted on a sample of the 15 largest commercial banks from 2009 to 2018. The empirical findings indicate that market concentration has a negative correlation with profitability, implying that the Indonesian banking industry strongly rejects the traditional hypothesis in favour of the efficiency hypothesis and that there is a relationship between market concentration and profitability (Naylah & Cahyaningratri, 2020).

3.4.5 DEMAND FOR MONEY THEORY AND LIQUIDITY PREFERENCE THEORY

Kurotamunobaraomi et al., (2017) used annual data from 1984 to 2014 to empirically investigate the interrelationship between liquidity and corporate performance in Nigerian banks. The work used Cash Reserve Ratio, Liquidity Ratio, and Loan Deposit Ratio as proxies for liquidity, and Return on Shareholders' Funds as a proxy for performance, as well as finometric analyses such as Ordinary Least Square Regression, Johanson Cointegration, the Granger Causality Test, and the Error Correction Model. Empirical findings revealed a significant negative short-run relationship between Cash Reserve Ratio and corporate performance, as well as a significant positive relationship between Loan-to-Deposit Ratio and Liquidity Ratio on one hand and corporate performance on the other, although insignificantly.

Ndoka et al., (2017) investigated whether liquidity risk management and performance are related. Secondary data were used to obtain test data, which were then analysed using the E-view package. The performance was measured using profit after tax, while the liquidity ratio was calculated using cash, deposits, and liquidity. The findings revealed that there is a positive relationship between profit before tax and cash, while the relationship between deposits and profit before tax is negative.

Osamwonji and Chijuka (2014) investigated the impact of macroeconomic variables on commercial bank profitability. The study was based on secondary data collected in Nigeria from 1990 to 2013. The secondary data came from the central bank along with

the companies' annual reports and financials. The macroeconomic variables analyzed were GDP, inflation rate, and interest rate, with return on equity serving as a proxy for profitability. The data were analysed using 17 different types of ordinary regression. The study discovered a significant positive relationship between GDP and return on equity, a significant negative relationship between return on equity and interest rate, and an insignificant negative relationship between inflation rate and return on equity.

The study goal was to investigate the effects of credit risk management on the performance of Kenyan banks. The study's specific objectives were to investigate the impact of management efficiency on bank performance in Kenya. This study was founded on the modern portfolio, capital asset pricing, and liquidity preference theories. The descriptive research design was used in the study, and the target population consisted of 44 commercials (28 local and 16 foreign). The bank has enough cash and equivalents to meet demand at any time, and cash and cash equivalents, capital ratio, and deposit ratio all show a positive increase in liquidity, increasing commercial bank profitability (Too & Makokha, 2021).

A descriptive research design was used in the study, which used secondary data obtained from the Central Bank of Kenya over five years from 2009 to 2013. The data was examined with SPSS version 21, and the results were tested for significance with ANOVA. Interest rates in Kenya have been fluctuating, with the impact on commercial banks' financial performance unknown. The study discovered that interest rates have a significant positive effect on the financial performance of Kenyan commercial banks. The relationship between interest rates and financial performance was also discovered to be linear, with higher interest rates resulting in higher profitability. The study also concluded that bank size and interest rate volatility had an impact on commercial bank profitability (Ngure, 2014).

Macharia (2013) investigated the effects of the global financial crisis on the financial performance of Kenyan commercial banks that provide mortgage finance. The study discovered a negative relationship between inflation, interest rates as a result of the global

financial crisis, and the financial performance of commercial banks in Kenya that offer mortgage finance. A unit increase in inflation and interest rates resulted in a decrease in the financial performance scores of Kenyan commercial banks offering mortgage finance, respectively. The study also discovered that exchange rates as a result of the global financial crisis had a positive effect on the financial performance of Kenyan commercial banks offering mortgage finance.

Buyinza (2010) examined samples of 23 commercial banks' profitability in Sub-Saharan African countries from 1999 to 2006. The study used panel data, and the regression study found that capital, efficient expense management, bank size, credit risk, bank diversification, per capita GDP, growth rate, and inflation all have a significant and positive impact on bank profitability.

Gul et al., (2011) investigated the factors influencing the profitability of 15 commercial banks in Pakistan from 2005 to 2009. With the help of an econometric package, the investigation used a regression model, panel data estimation, and the Pooled Ordinary Least Squares (POLS) method of computation. Internal and external factors such as bank size, loan, deposit, GDP, inflation, and market capitalisation were found to have a significant positive influence on bank profitability as measured by return on assets (ROA).

Rachdi (2013) investigated which factors influenced bank profitability during and before the global financial crisis. The study examined 10 Tunisian banks from 2000 to 2010. The regression results show that before the US subprime crisis, capital adequacy, liquidity, bank size, and annual real GDP growth all have a positive impact on the bank performance (ROA, ROE, and NIM). Moreover, the cost-income ratio, yearly deposit growth, and inflation rate are all negatively correlated across all measures of bank profitability.

Khrawish and Siam (2011) investigated the determinants of profitability in three Jordanian Islamic banks between 2005 and 2009. The results of the multiple linear regression show that capital, bank size, financial risk, GDP growth rate, inflation, and exchange rate 22

have a significant negative relationship with profitability, whereas credit risk has an insignificant positive relationship with the profitability of Islamic banks in Jordan.

Buyinza (2010) examined samples of 23 commercial banks' profitability in Sub-Saharan African countries from 1999 to 2006. The study used panel data, and the regression results revealed that capital, efficient expense management, bank size, credit risk, bank diversification, per capita GDP, growth rate, and inflation all have a significant and positive impact on bank profitability. Deposits Banks are said to be heavily reliant on funds provided primarily by the public as deposits to finance loans made to customers. Payments are widely seen as the least expensive source of funds for banking organizations, and hence deposits have a beneficial impact on bank profitability when demand for bank loans is high. That is, the higher a commercial bank's deposit base, the greater its ability to make loans and profit. However, if demand for bank loans is low, having more deposits may reduce earnings and result in a low profit for the banks. This is because deposits such as Fixed, Time, or Term deposits attract high interest rates from banks to depositors. The study used panel data, and the regression results revealed that capital, efficient expense management, bank size, credit risk, diverse earning ability of banks, per capita GDP, growth rate, and inflation have a significant and positive impact on banks' profitability.

Lukorito et al., (2014) studied 43 commercial banks from 2009 to 2013 to assess the effect of liquidity on the profitability of Kenya's commercial banks. ROA ratios were used to calculate profitability. Using the Ordinary Least Squares Technique, researchers discovered that liquidity has a statistically significant and positive relationship with bank profitability. According to the study, banks should invest heavily in assets if large profits are required, maintain adequate levels of liquidity in the form of short-term marketable securities to realise profits, and aggressively identify viable investment opportunities and link such opportunities to customer deposits.

Otwoko and Maina (2021) investigated how liquidity risk affects institutions that accept deposits, save money, and extend loans in Kenya. To model the association between

liquidity risk and financial performance, the study used a descriptive survey approach and regression methodologies, and correlation results revealed that liquidity risk and financial performance are negatively correlated. Implying deposit-taking establishments with a low asset base struggle to obtain enough funds to cover lending obligations, and firms experiencing financial difficulties must either acquire available funds or external financing., which raises the cost of funding and has a negative impact on financial performance. The influence of liquidity risk on deposit-taking financial performance was demonstrated in the study using panel data regression analysis.

3.5 HYPOTHESIS DEVELOPMENT

The current research is a descriptive and analytical study that attempts to test hypotheses, present findings, and make recommendations based on the relative impact of liquidity, leverage, and solvency on profitability.

H1: There is a positive relationship between liquidity and bank performance.

Charmier et al., (2018) results revealed a positive relationship between liquidity and ROA. Firms that properly manage their short-term obligations have a positive impact on firm profitability (Bibi & Amjad, 2017). Otekunrin et al., (2019) study concluded that liquidity management and bank performance are positively related. Ehiedu (2014) discovered a significant positive relationship between the current ratio and profitability as measured by return on assets (ROA).

H2: There is a significant relationship between liquidity and bank performance.

Muriithi and Waweru's (2017) results showed that NSFR is negatively related to bank profitability both in the long and short run. The liquidity coverage ratio does not significantly influence financial performance. Charmier et al., (2018) found a negative relationship between liquidity and ROE. Malik et al.'s (2016) results indicated a negative relationship between the Profitability Ratio and the Liquidity Ratio. Liquidity has a negligible negative impact on financial performance (Dahiyat et al., 2021). The

relationship between ROA, ROE, and CR is negative (Hristova et al., 2019). Marozva's (2015) investigation resulted in a negative and significant association between liquidity risk and bank performance. Andersson and Minnema's (2018) findings revealed a negative, linear, and significant relationship between leverage and profitability. Dahiyat's (2016) study concluded that solvency as measured by debt ratio has no significant impact on bank profitability. Ahmad et al., (2015) and Khidmat and Rehman's (2014) results revealed that there is a significant negative relationship between financial leverage and firm profitability.

H3: There is a significant relationship between leverage and bank performance

According to Alshatti's (2015) research findings, the solvency ratio has a positive effect on profitability. This is because the higher the solvency, the greater the level of financial stability that enterprises can achieve, thereby assisting enterprises with financial independence and financial security improvement. As a result, the enterprise would be able to improve productivity and efficiency, achieving the goal of increased profitability. Abor's (2007a) study concluded that leverage has a positive influence on financial performance. According to Alshatti's (2015) research findings, the solvency ratio has a positive impact on profitability. Nguyen and Nguyen (2020) found a positive relationship between solvency and profitability measured by ROA. Abu Mouam's (2011) and Al-Omari (2020) study concluded that profitability as measured by ROA (return on assets) has a positive relationship with solvency, as measured by the (DE) Debt/Equity ratio. Ali et al., (2021) found a negative relationship between solvency and profitability. The following chapter focuses on the methodological approach that was employed to carrying out this investigation.

CHAPTER 4: METHODOLOGY

4.1 INTRODUCTION

The section outlines a study's scientific approach as well as the research approach adopted. According to Kothari (2004) and Mishra and Alok (2011), research methodology is a method for systematically solving a research problem. It can be viewed as a science that studies how scientific research is carried out, while Ndou (2016) defined it as a set of measures that are followed to carry out a specific study. Leedy and Ormrod (2014) stated the existence of two methods for conducting research, including qualitative research and quantitative research.

Researchers using quantitative research methodology emphasise quantification in the collection and analysis of data, adopt a deductive approach to the relationship between theory and research, place a strong emphasis on the testing of theories and incorporate practice and norms used in the field (Bryman et al., 2014). In contrast, qualitative research approaches typically emphasise words over numbers in data collection and analysis. The emphasis is primarily on an inductive approach to the relationship between theory and research, with an emphasis on generating rather than proving theories and rejecting the practices and norms of the natural scientific model, particularly positivism, in favour of an emphasis on how people interpret their social environments. Individuals interpret social reality and consider it to be both ever-changing and emergent (Bryman et al., 2014).

A quantitative strategy was adopted for this project, include statistical secondary information to achieve the objectives of the study. Kana (2017), Saunders et al. (2009), and Makombe (2017) emphasised that numerical data and statistical methods are used in quantitative research to investigate the connections among the characteristics in a specific population. The research design is covered in this chapter as well, paradigm, scientific theory, data analysis with model specifications.

4.2 RESEARCH DESIGN AND PARADIGM

To fulfil the research aims, the quantitative approach method was employed in this study to investigate the association across bank performance and independent factors. As per Saunders et al., (2007), a scientific design is required for any study in order to address the research problems and fulfil the objectives of study. Mouton (2009) described research design as a set of principles and instructions that must be followed in investigating the research challenge. The positivist and deductive research paradigms are used to support the study's quantitative nature (Krauss, 2005; Saunders et al., 2012). Krauss (2005) defined positivism as the quantification of information in which numerical procedures and analytics are utilised to anticipate, elucidate, and define a pattern.

Fard (2012) and Kivunja and Kuyini (2017) asserted that the term “paradigm” was initially introduced by Thomas Kuhn in his seminal work *The Structure of Scientific Revolution* (1962). According to Saunders et al. (2016), a research design is a blueprint that links a research approach's philosophical perspectives and methodological presumptions, while Perera (2018) and Creswell (2014) stated that research paradigms are a set of shared beliefs and agreements among scientists about how to analyse and resolve problems. Perera (2018) further stated that research paradigms are methods by which scientists react to three fundamental problems of ontology, epistemology, and methodology.

4.3 RESEARCH APPROACH

A research approach, according to Sudeshna and Datt (2016), is a strategy and technique that involves assumptions that help the researcher make informed judgments concerning data collection, analysis, and interpretation methodologies. Saunders et al., (2009) further stated that the research approach can be either deductive or inductive. Inductive approaches involve developing a theory considering data that has already been collected, whereas deductive approaches involve testing a theoretical proposition based on certain research strategies (Burney & Saleem, 2008). To accomplish the intended objective of the research, the quantitative research technique was applied. The research emphasis

goal was to examine the effects of liquidity and solvency on South African bank performance. Quantitative research is more deductive, with the researcher attempting to investigate an existing model rather than constructing a new one based on evidence. (Saunders et al., 2012). A deductive technique was determined to be the most appropriate for this study. As a result, the research can also be categorised as quantitative.

4.4 POPULATION AND SAMPLING

When investigating a problem, it is necessary to take into account the entire population. Despite this, it is practically impossible to choose such a representative sample, so instead a representative sample of the entire population is selected (Acharya et al., 2013). Saunders et al. (2016), denotes population denotes as a number of feasible units or components that are considered in the study. The demographic and sample for this study is identified and outlined in the following subsections.

4.4.1 Population

A population, based on Leedy and Ormrod (2016) and Blanche et al., (2006), is the larger spread under which sampled elements were gathered while predictions are formed. However, due to the larger size of the population or a lack of research resources, it is possible that evaluating the entire population will be impossible, and the researcher must then consider only selected samples of the elements under review. Data were received from the SARB, and the population used in this research was selected from South African registered banks under the requirements of the Banks Act 94 of 1990. Listed below is the study's sample. In the table, banks' names are arranged according on the size and total assets.

Table 4.1 South African banks registered in terms of the Banks Act 94 of 1990 as of 31 December 2022

Name of bank	Total assets as of 12 April 2022 (R Millions)
Standard Bank	1,619,908,880
First National Bank	1,432,112,263
Absa Bank	1,352,936,761
Nedbank	1,095,177,013
African Bank	26,712,112
Grindrod Bank	14,965,153
Capitec Bank	175,459,291
Investec Bank	515,219,692
Bidvest bank	11,309,859
Sasfin Bank Limited	7 778
Discovery Bank	15,538,652
Ubank Limited	5 224
Tyme bank	4,128,870

Source: South African Reserve Bank (2022)

4.4.2 Sampling

Choon et al., (2013) defined “sample size” as the number of units in the population on which the study will be based. Sampling is the act of selecting a small sample from a larger population to serve as the foundation for evaluating or forecasting the presence of an unexpected data point, circumstance, or outcome concerning the larger population (Kumar 2011). The empirical research was carried out by selecting a sample of South African banks. This study employed a purposive sampling technique in the selection of banks. Purposive sampling is a non-probability sampling technique where the representatives are chosen in which the chances of a subject being chosen are unknown. With the purposive sampling technique, discretion is used in the selection of banks for the

sample population. Purposive sampling means that the researcher's discretion, judgment and knowledge of the research area, population and variables were used. The sampling technique helps in filtering out the banks that were not represented during the period of analysis. However according to Acharya et al., (2013), purposive sampling might suffer from selection bias. Despite the method's intrinsic bias contributing to its ineffectiveness, it remains robust even when evaluated against random probability sampling (Tongco, 2007). Purposive sampling, a non-probabilistic sampling method, was employed to choose the study's sample, that included 13 South African commercial banks because they are the country's leading banks and have a significant influence on the country's financial sector.

The population for this study was the financial sector in South Africa, and the sample included 13 banks with local licenses between 2012 and 2021. The period of time for the banking industry's data was 2012 through 2021, being the most recent information offered by the SARB. The study included a 10-year time frame. Data were chosen based on the availability on the variables during the time period under consideration. The banks selected included: Standard Bank, First National Bank, Absa Bank, Nedbank, African Bank, Mercantile Bank, Capitec Bank, Investec Bank, Bidvest bank, Sasfin Bank Limited, Discovery Bank, and Ubank Limited.

4.5 DATA AND VARIABLES

The information was obtained from the South African Reserve Bank, the Worldwide Monetary Fund's (IMF) database of international financial statistics, and global development funding. The study's goal was to evaluate the implications of liquidity along with solvency on the performance of South African financial firms. Performance metrics such as return on assets (ROA), net interest margin (NIM), and return on equity (ROE) were used as dependent variables, while liquidity and solvency were used as independent variables.

Table 4.2 Summary of variable description and expected signs

Variable	Description	Definition/proxy	Previous studies that used the variable	Expected sign
Dependent Variable				
Performance measures	Return on assets (ROA)	ROA – evaluates the bank's resource use and financial strength.	Narwal & Jindal, 2015; Marozva, 2015.	N/A
	Return on Equity (ROE)	ROE – measures how well management achieves the goal of increasing shareholder wealth.	Marozva, (2017)	N/A
	Net Interest Margin (NIM)	NIM – This is a difference between the bank's interest earnings and interest expenses as a percentage of total assets.	Obeid & Adeinat (2017) Almaskati (2022) Imran, Lashari, Soomro & Shah (2021)	N/A
	Z-Score	Z-score is the bank performance adjusted for risk.	Taranhike,2017 Swanepoel, Estheehuisen, Van Vuurren & Lotriet, 2017	N/A

Independent variables				
Leverage (LEV)	Debt-to-equity ratio (DER)	DER – measures how much of a company's operations are funded by debt rather than internal resources.	Fahmi, (2015).	+/-
	Total debt to asset ratio (TDR)	TDR – shows how much debt a company has relative to how much money it has. It also shows how much of the company's assets are financed by creditors.	Ahmad & Ali (2016)	+/-
	Long-term debt-to-asset ratio (LTDR)	LTDR – is defined as debt with a payback duration of more than a year.	Mbonu & Amahalu (2021) Jacinta, Chukwubuikem, Ndubuisi & Chinyere (2022)	+/-
	Short-term debt-to-asset ratio (STDR)	STDR – refers to a company's debts that must be repaid within a year.	Wilson, Idachaba & Shallangwa (2022)	+/-

Liquidity (LIQ)	Net stable funding ratio (NSFR)	The NSFR mandates that banks maintain a consistent funding profile for their off-balance sheet assets and activities. The purpose is to limit the risk of a bank's liquidity position being eroded by disruptions to its typical financing sources.	Kauko (2015) Marozva (2017)	+/-
	Liquidity coverage ratio (LCR)	LCR is the percentage of highly liquid assets held by financial institutions to ensure their ability to meet short-term obligations in the future.	Murphy (2021)	+/-
	Current ratio (CR)	CR – This is a liquidity ratio that determines a company's capacity to meet short-term debt and commitments.	Tamplin (2022)	+/-
Bank-specific control variables (BSV)	Non-performing loans (NPL)	NPL – A non-performing loan is the oldest form of credit risk facing the banking industry that arises when borrowers are unable or unwilling to repay their loans.	Afolabi, Obamuyi & Egbetunde (2020)	-

	Total assets (SISE)	The total asset value of a bank determines its size.	Nyoka (2017)	+/-
	Capital ratio (BCR)	BCR – The Capital Adequacy Ratio measures a bank's ability to deal with credit risk using its capital.	Nguyen (2021) Baldwin, Alhalboni & Helmi, 2019; Hafez & El-Ansary, 2015	+
Macro-economic control variables (MEV)	Exchange rate (ER)	ER – The value of a country's currency concerning the currency of another country or economic zone.	Maralutua & Pulungan, 2019	+/-
	Real gross domestic product (RGDP)	RGDP – the macroeconomic variable that is involved in the growth of a country's economy.	Shafique, Hassan, Shahzad, Ali & Saqlain (2022)	+
	Interest rate (IR)	IR – is either a cost of borrowing money or the reward for saving money	(Islam & Nishiyama, 2016)	+/-
	Inflation (INF)	INF – rise in prices and a decrease in a country's purchasing power.	Kana (2017)	-

Source: Author's compilation

The table 4.2 above demonstrate liquidity, solvency and bank performance ratio used in the study and researchers who have used the measures prior within South African context and outside S.A.

The three independent variables, CR, LCR, and NSFR, were regressed by the researchers. NIM, ROA, ROE, and Z-score were used as bank performance measures. While LTDR, STDR and TDR was utilized as leverage.

Andersson and Minnema (2018) results of leverage (LTDR and STDR) was negatively correlated to bank performance. Furthermore, Nguyen and Nguyen (2020) Leverage and ROA were positively correlated with one another, with solvency measured by TDR, LTDR and STDR.

Additional Muriithi and Waweru (2017) also conducted a study on LCR, NSFR and ROE. The results showed that NSFR is negatively related to bank profitability both in the long and short run. These findings are consistent with those of Charmier et al. (2018), Dahiyat et al., (2021) and Marozva (2015), who found a negative connection between performance and liquidity.

4.5.1 Dependent variables

4.5.1.1 Return on Equity – ROE

ROE is a measure of profitability that is also known as the rate of return on equity investment in a company. It measures how effectively management achieves the goal of maximisation of shareholder wealth the ratio is calculated by dividing the firm's net income by the firm's shareholder equity and measures the efficiency with which managers generate profits by utilising the firm's assets (Marozva, 2017).

$$\text{ROE} = \frac{\text{Net income}}{\text{Shareholders}}$$

4.5.1.2 Return on assets – ROA

According to Matthews and Thompson (2014), the return on assets measures the bank's performance. A bank's return on assets is computed by dividing net income by total assets. The return on assets ratio has been used to gauge profitability, productivity, and efficiency, as well as to provide management insight on the banks' financial performance (see, for example, Narwal & Jindal, 2015; Marozva, 2015). The return on assets ratio evaluates the bank's resource use and financial strength (SavoIU et al., 2013).

$$\text{ROA} = \frac{\text{Net income}}{\text{Total assets}} \times 100$$

4.5.1.3 Net interest margin – NIM

According to Obeid and Adeinat (2017), net interest margin (NIM) is one of the most important variables used to assess a bank's ability to manage savings and make loans. In addition, NIM is the best measure for measuring the efficacy and stability of a bank's operations since it outperforms return on assets in displaying how well banks manage their interest-bearing assets (Saksonova, 2014). It is calculated by dividing the difference

between credit interest rates on loans and debit interest rates on deposits by total assets. This method of measurement was widely used in the relevant literature (Shami et al., 2015; Hamadi & Awdeh, 2012). According to Almaskati (2022) and Imran et al., (2021), NIM is the difference between the bank's interest income and expenditure as a proportion of total assets. A higher figure denotes a more successful bank. Imran et al. (2021) further stated that the higher the NIM proportion, the higher the bank's yield line. Typically, any financial organisation's income is mainly reliant on interest on distributed loans, while Endri and Fathony (2020) asserted that the NIM ratio of the bank plays a role in investment decision-making.

$$\text{NIM} = \frac{\text{Interest earnings} - \text{Interest cost}}{\text{Interest earning assets}} \times 100$$

4.5.1.4 Bank overall risk = Z-Score

Z-SCORE was used to assess the bank's total risk appetite (RISK). The Z-score is subtracted from the likelihood that bank losses exceed capital under the erroneous assumption of regularly distributed return on assets (Swanepoel et al., 2017). Non-performing loans largely represent credit or default risk, whereas the Z-Score represents the bank's total risk exposure (Taranhike, 2017).

$$\text{Z-Score} = \frac{\text{ROA} + \text{CAR}}{\text{ROA}}$$

4.5.2 Independent variables

4.5.2.1 liquidity variables

i) Net stable funding ratio (NSFR)

According to Kauko (2015), the net stable funding ratio reduces banks' liquidity risks by enabling the use of store subsidising. Lending creates deposit money, but the

requirement limits the amount of money that may be loaned. Banks are required to have appropriate, stable funding to meet the lifetime of their long-term assets under the liquidity requirement. To meet the criteria, banks must maintain a 100 per cent ratio. Marozva (2017) pointed out that the availability of stable funding for a bank will be determined by the nature of its liquid assets and the remaining maturities of these assets, including off-balance sheet assets. The NSFR is determined, according to BCBS (2014), by dividing the amount of stable funding that is available by the amount of stable financing that is needed.

$$\text{NSFR} = \frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}}$$

ii) **Liquidity coverage ratio (LCR)**

Murphy (2021) defined “liquidity coverage ratio” as the percentage of highly liquid assets kept by financial institutions to ensure the ongoing ability to meet short-term obligations. The LCR is calculated by dividing a bank's high-quality liquid assets by its total net cash flows over a 30-day stress period. The high-quality liquid assets include only those assets with a high potential to be converted easily and quickly into cash.

$$\text{LCR} = \frac{\text{High-quality liquid asset amount}}{\text{Total net cash flow amount}}$$

iii) **Current ratio**

Tamplin (2022) defined the current ratio as a liquidity ratio that determines a company's capacity to meet short-term debt and commitments. The current ratio is a simple gross liquidity statistic that compares liquid assets to current liabilities. The current ratio is determined by dividing the company's current assets by current liabilities (Ali et al.2021). Sumani and Roziq (2020) discovered that the current ratio does not affect the performance measures ROA and ROE.

$$\text{Current ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

4.5.2.2 Leverage ratios

(i) Debt-to-equity (D/E)

One of the solvency ratios is the debt-to-equity ratio(D/E). D/E is a financial statement analysis metric that indicates the amount of collateral available to creditors (Fahmi, 2015). The debt-to-equity ratio (D/E) quantifies how much an organization relies on debt rather than internal resources to fund its operations. It is one of the most effective ways to understand a company's capital structure and to observe financial leverage. According to Khidmat and Rehman (2014), the debt-to-equity ratio influences return on assets, which is consistent with research findings demonstrating that the debt-to-equity ratio has a significant negative impact on return on assets (ROA). It is computed by dividing the total liabilities of the company by shareholder equity.

$$\text{D/E ratio} = \frac{\text{Total debt}}{\text{Total shareholder equity}}$$

(ii) Total debt to asset (TDR)

The total debt to assets ratio is a financial leverage ratio that illustrates the total amount of debt as compared to the firm's total assets and illustrates the number of the firm's assets that were financed by creditors. It is calculated by dividing the firm's total assets by the sum of its short- and long-term debts. According to Raza (2013), there is a positive relationship between total debt to total assets and return on equity, while Joshua (2007) and Ahmad and Ali (2016) found that the debt-to-assets ratio harms firm performance.

$$\text{TDR} = \frac{\text{Total liabilities}}{\text{Total assets}}$$

(iii) Long-term debt to asset (LTDR)

Long-term debt refers to a company's loans and other liabilities that are not due within one year of the date of the statement of financial position (Mbonu & Amahalu, 2021), while Jacinta et al., (2022) further defined “long-term debt” as financing with a payback period of more than one year, and frequently up to 20 to 30 years. Long-term financing is typically used to acquire large assets such as buildings and equipment, and the assets are frequently used as collateral on the loan.

The long-term debt-to-total-assets ratio is a measure of how much of a company's assets are financed by long-term debt, which includes loans and other long-term debt commitments. This ratio is a general indicator of a company's long-term financial position, including its ability to meet its debt obligations (Investopedia, 2020).

$$\text{LTDR} = \frac{\text{Long term debt}}{\text{Total assets}}$$

(iv) Short-term debt to asset – (STDR)

According to Jacinta et al., (2022), short-term debt, also known as current liabilities, refers to a company's financial obligations that are due to be paid back within a year. When assessing a company's liquidity, the short-term debt account is an important factor to examine. If the debt to liquid assets ratio is excessively high, an analyst may assume that the company is experiencing a liquidity problem and reduce its credit rating.

Wilson et al., (2022) and Northouse’s (2018) studies found that a bank's short-term debt to total assets ratio has a significant impact on financial performance, while Kasasbeh’s (2021) study findings revealed that short-term debt has a significant and negative influence on return on assets and return on equity.

$$\text{Short-term debt to asset} = \frac{\text{Short-term debt}}{\text{Total assets}}$$

4.5.2.3 Bank-specific control variables

i) Bank size

The size of a firm has a significant impact on the nature of the association between the functional atmosphere and the external environment. In this new era of fierce competition, the size of a company is crucial. The most pressing topic regarding financial performance would be whether bank size matters (Kana, 2017).

According to Nyoka (2017), the total asset value of a bank determines its size. Total assets are the total market value of the securities in the funds. The impact of size on financial profitability is assumed to be favourable to some extent in general. However, due to bureaucracy and other factors, the effects of size on banking performance could be negative in extreme cases (Khoza, 2020). In terms of size, smaller banks are more efficient worldwide, but larger banks are more efficient locally. It means that profitability and efficiency are linked. Productivity is not the only element that influences profitability, but it is a significant one (Koundal, 2022), while according to Aladwan (2015), profitability grows as bank size decreases, but profitability decreases as bank size increases. Small and medium banks are expected to be more profitable than larger banks.

Further, Alex and Ngaba (2018) research was done on how Kenyan commercial banks' profitability was affected by bank size. The banks were classified as large, medium, or small. Large to medium banks have a higher return on assets (ROA) than small banks, according to the findings. As a result, the research found a link between bank size and performance in Kenya.

ii) Capital adequacy ratio - CAR

The bank's capital adequacy ratio influences the working success of financial banking institutions and the kind of risks the banks can take over. The capital adequacy ratio has

an indirect effect on the bank's financial results (Spaseska et al., 2022). Batten and Vo (2019) investigated the factors influencing bank profitability in Vietnam. According to the findings of the research, capital adequacy, risk, expense, and productivity, all have a significant impact on profitability.

According to Nguyen (2021), to maintain the sound and efficient operation of the financial system, the central bank establishes a minimum capital adequacy ratio for commercial banks through regulatory rules. Setiawan and Muchtar (2021) further stated that using the minimum capital adequacy ratio increases the financial system's stability and efficiency by lowering the risk of insolvency. The Capital Adequacy Ratio measures a bank's ability to deal with credit risk using its capital (Baldwin et al., 2019; Hafez & El-Ansary, 2015).

$$CAR = \frac{\text{Bank capital}}{\text{Risk weighted assets}} \times 100$$

iv) Loan performance (non-performing loan) credit risk

Afolabi et al., (2020) defined “non-performing loans” as the oldest form of credit risk facing the banking industry and often referred to as the risk default arising from the failure of borrowers to meet their obligations in terms of loan repayments. Muthoni et al. (2020) stated that Kenyan commercial banks had more nonperformance in loans over the study period from 2015 to 2018 than the world average, according to a World Bank analysis. Despite having the most stable and established banking system in East and Central Africa, according to Beck et al., (2015), the level of non-performing loans is an indicator of bank performance, and the lower the level, the better.

Ozili (2018) investigated the factors that influence NPLs as a predictor of financial stability. The study found that bank efficiency, bank concentration, foreign bank presence, unemployment rate, and banking sector size are significant predictors of aggregate NPLs, however, higher government effectiveness, high competition, and strong legal systems

reduced the persistence of non-performing loans in the post-financial crisis period, while according to Taiwo et al.(2017); Afolabi et al. (2020), findings show that credit risk influences financial performance in the Nigerian banking industry.

4.5.2.3 Macro-economic control variables

i) Economic growth (GDP growth)

Shafique et al., (2022) asserted that GDP is a macroeconomic variable that is involved in the growth of a country's economy. Many countries are concerned with the sustainable growth of an economy, and the gross domestic product is the valuing economic indicator of a nation. According to CFI (2021), the economic growth rate is the percentage change in the cost of a country's output of goods and services over time, as compared to a preceding period.

GDP and profitability have a negative relationship, according to De Leon (2020) and Almaqtari et al., (2019). Islam and Nishiyama (2016) discovered that the rate of economic expansion has a detrimental impact on bank profitability. On the contrary, it is noted that GDP and bank profitability are positively related (Le & Ngo, 2020; Uralov, 2020).

ii) Interest rate

According to Farooq et al., (2021) and Al-Harbi (2019), interest rates and bank profitability have a negative relationship because they impose a real burden on borrowers, causing asset quality to deteriorate and thus reducing banking profitability. When interest rates are low, more companies are prepared to borrow money to develop their operations, resulting in higher stock values (Huang et al., 2016).

Interest rates harm bank profitability (Islam & Nishiyama, 2016). According to Zimmermann (2019), a negative deposit interest rate would lead their customers to withdraw their deposits and take them elsewhere and banks' profitability will be

negatively affected, while Fajri et al., (2022) results found that the interest rate does not affect the profitability of Islamic banks. An increase in interest rates leads to an increase in banks' profitability (Hall, 2021).

v) Exchange rate

The value of a country's currency concerning the currency of another country or economic zone is known as an exchange rate. Most exchange rates are free-floating, meaning they will rise or decrease in response to market supply and demand (Maralutua & Pulungan, 2019; Chen, 2021). Farooq et al., (2021) state that banks with foreign currency assets or liabilities face foreign exchange rate risk, which affects bank capital and profitability as exchange rates fluctuate. Regardless of predictions and estimates, an exchange can be moved upstream or downstream. These ambiguous movements pose a risk to a bank's capital and turnover when they contradict the desired goals.

Maralutua and Pulungan (2019) found that Value Exchange harms Profitability. Indirectly, exchange rate volatility influences depositors' and borrowers' behaviour as well as banking risk and bank performance (Nafiseh et al., 2020). According to Lambe (2015), exchange rate fluctuations have a substantial influence on bank performance. Kemisola et al., (2016) investigated exchange rate volatility and Nigerian banking performance. According to the findings, exchange rate volatility has a negative and significant impact on bank profitability.

iv) Inflation

Inflation is defined as a gradual rise in the average cost of goods and services in the economy over time (CFI, 2021), while according to Shafique et al., (2022), inflation is defined as a rise in prices and a decrease in a country's purchasing power. Umar et al. (2014) stated that inflation improves bank performance if banks can anticipate future inflation and adjust interest rates to generate more revenue than costs, resulting in higher profit and performance as a result of adjusting the rate of interest.

Kana (2017) asserted that a high rate of inflation is linked to both increased expenses and higher revenue. Inflation is projected to have a favourable influence on profitability if a bank's income rises faster than its costs. A negative coefficient, on the other hand, is expected when a company's costs rise faster than its revenue. The rate of inflation harms banks' performance (Almaqtari et al.,2019; Jadah et al., 2020), while Islam and Nishiyama (2016) discovered that the rate of inflation has a positive effect on bank profit. Profitability is a proxy for inflation, and it has no significant positive influence (Maralutua & Pulungan, 2019).

4.6 DATA ANALYSIS AND MODEL SPECIFICATIONS

The system-generalized technique of moments was used in the study to investigate the deterministic link between the chosen independent variables and the study's proxies for bank performance. In this study, the relationship between bank performance indicators, solvency factors, and liquidity indicators was investigated utilising a panel data regression analysis. The Generalised Method of Moments (GMM) was used to run regression models. EViews software cannot execute diagnostics for panel data regression, according to Cameron and Trivedi (2009), STATA software, however, can analyze both time series and panel data. One of the greatest tools for using regression models is STATA software, which enables environmental forums, manages both time series and panel data, and provides access to user-written instructions. Model specification is the process of determining which independent variables to include and exclude from a regression equation (Frost, 2022). Panel data regression tools have been carried out in most studies conducted by the following researchers in this field, such as Marozva (2017), Taranhike (2017) and Makonko (2016).

4.6.1 Panel data regression analysis

The regression of panel data is the method used in this investigation. In this study, the bank performance measures were regressed against bank leverage, liquidity, bank-specific control variables and macroeconomic variables. As a result, panel data

regression was used as it captures both the time series element and the cross-sectional element of the data (Marozva, 2017). Panel data also has the advantage of providing more usable data, which increases dependability, reduces covariance across variables, and increases flexibility and efficiency (Barth et al., 2013).

Panel regression approaches were utilised in the study to examine the correlation between bank-specific indicators and macroeconomic factors influencing bank profitability. A panel data set is a collection of data that tracks the behaviour of businesses through time. Since the mid-1970s, regression analysis has played a significant role in empirical research (Chmelarova, 2007). When using panel data to estimate an economic link, individual differences are taken into consideration (Sibindi, 2017).

i) Panel data model

Panel data is multi-dimensional data of an observation that is measured repeatedly over time (Alam, 2020), while according to Baltagi (2005), "panel data" refers to "the pooling of observations on a cross-section of households, countries, firms, and so on over several periods". In general, panel data is a hybrid of cross-sectional and time-series data. Cross-sectional data is defined as a single observation of multiple objects and variables at a single point in time (i.e., an observation is taken once). Time series data only observe one object over time. Panel data combine both characteristics into a single model by collecting data from multiple, identical objects over time (Brugger, 2021).

The general panel data model is built on this notation:

$$Y_{i,t} = \alpha + \beta X_{i,t} + \mu_i + \varepsilon_{i,t}, i = 1, \dots, N; t = 1, \dots, T \quad (1)$$

Where:

Y = Dependent variable

X = Exogeneity

β = Coefficients

α = constant

$\varepsilon_{i,t}$, – is the disturbance in the model.

μ_i - Represents fixed effects in bank i

ii) Pooled effects model – OLS

Pooled – OLS is a simple OLS (Ordinary Least Squares) model applied to panel data. It disregards time and individual traits in favour of focusing solely on dependencies between individuals. However, simple OLS requires that unobserved independent variables and exogeneity do not correlate (Brugger, 2021). Stated as follows:

$$Y_{i,t} = \alpha + \beta X_{i,t} + \mu_i + \varepsilon_{i,t}, i = 1, \dots, N; t = 1, \dots, T \quad (2)$$

i denotes households, individuals, firms, countries, etc.

t denotes time

i subscript denotes the cross-section dimension

t subscript denotes the time-series dimension

α is a constant

β is $K \times 1$

X_{it} is the it observation on K explanatory variables (Baltagi, 2005).

iii) Random effects (RE) model

RE models use random variables to determine the individual impacts of unobserved, independent factors over time. Random effects can "change" between OLS and FE, hence, focusing on both dependencies between and within individuals (Brugger, 2021). According to Brugger (2021), to include between- and within-estimators, one must first define when to use which estimator. In general, if the covariance between alpha and exogeneity is zero (or very small), there is no correlation, and an OLS model is preferred. If that covariance is not zero, there is a relationship that should be eliminated using an FE model:

$Cov(X_{it}, \alpha_i) \neq 0$ FE Models

$Cov(X_{it}, \alpha_i) = 0$ OLS

iv) Fixed effects- (FE) model

According to Bruggen (2021), FE models determine that the individual effects of unobserved, independent variables remain constant over time. Endogeneity can occur when unobserved, independent variables are included in FE models. The fixed effect model, according to Borenstein et al., (2010) assumes that the study has one genuine size of the effect that is identical throughout the investigation, with the term size of the effect being the difference in the mean values of the effect size between two groups. Internal errors, such as inaccuracy in calculating the amount of the effect, are the only basis for differences in effect size (Borenstein et al., 2010). Bruggen (2021) stated that independent variables and endogeneity are both possible:

$$Y_{i,t} = \alpha_i + \beta X_{i,t} + \mu_i + \varepsilon_{i,t}, \text{ where } Cov(X_{it}, \alpha_i) \neq 0 \quad (3)$$

v) Drawback of models

Concerning the fixed effect model, the first disadvantage is that the approach does not distinguish between heterogeneity and idiosyncratic endogeneity when the null hypothesis of homogeneity of the covariates is rejected. Second, in the estimating equation, the structural equation does not make all explanatory factors strictly exogenous, including those that may be endogenous. Instead, they can only be concurrently exogenous, which means that only pooling techniques or their method of moments variations can produce reliable estimates. This rule forbids the use of quasi-generalized least squares approaches, such as the generalized estimating equations (GEE) method (Lin & Wooldridge, 2017).

Given the entire history of the covariates, the random effects approach constrains the

conditional distribution of heterogeneity. This is a disadvantage when compared to fixed effects approaches. However, when explanatory variables are strictly exogenous, estimating average partial effects requires few other assumptions, and the constraints on the conditional heterogeneity distribution can be lax. Stationarity and weak dependence on processes over time, for example, are not required. In other words, CRE, FE, and CMLE all involve trade-offs between assumptions and the types of quantities that can be estimated when using balanced panels (Wooldridge, 2019).

Fixed effects and random effects approaches have the disadvantage of only allowing for one type of endogeneity: correlation between time-varying explanatory variables, commonly using a temporal average of these variables, and time-constant heterogeneity. However, in many cases, we may be concerned with idiosyncratic errors, which are correlations between at least some of the covariates and unobserved shocks (Lin & Wooldridge, 2017).

According to Wooldridge (2019), the number of periods required for the bias adjustments to work properly may be greater than what is available in many applications. (Technically, the adjustments are obtained by assuming T .) Second, many bias corrections assume stationarity in the time series dimension, and they all require weak dependence; in some cases, the untenable assumption of serial independence is maintained. Stationarity rules out common empirical techniques like including dummy variables to capture secular time effects. Weak dependence is maintained because the asymptotic analysis requires both T and N to be large.

Baltagi (2005), the drawbacks of employing panel data include the likelihood of design and data collecting problems, such as inadequate population reporting or nonresponses owing to measurement errors induced by confusing questions, purposeful data distortions, or memory difficulties. Panel data may distort measurement errors caused by ambiguous questions or memory errors. Another limitation is cross-section dependence, which can lead to incorrect conclusions. As a result of these shortcomings, the study employed the GMM model.

To ascertain the ramifications of liquidity and leverage on financial achievement, this became necessary for the purpose of determining which other elements might affect an institution achievement. According to Taranhike (2017), accounting ratios and scores are variables that model bank performance and were previously used by several students in their research (Taranhike, 2017; Makonko, 2016). With this research, identical parameters and substitutes were used for liquidity, leverage and financing performance. This empirical model was based on the panel regression equation proposed by Raz et al., (2014) and Chortareas et al., (2011). For the study, 12 different equations were estimated, nine of which correspond to unadjusted banking performance, the metrics for ROE, ROA, and NIM, together with the final three to risk-adjusted banking performance, namely a Z-score.

4.6.2 Generalised method of moments (GMM)

The general method for generating statistical model is defined as a GMM. Momentary conditions are utilised, which are formulation of effective and information functions of zero anticipation at the parameter's real worth (Blundell & Bond, 1998). A model for generated moments was created through Arellano and Bond (1991) and Blundell and Bond (1998) which can be utilised with dynamic panel data. The cause-and-effect relationship for an underlying phenomenon in dynamic panel data is often changing over time.

According to Roodman (2009) and Arellano and Bond (1991), the GMM estimator may be employed with two types of transformation methods: first-difference transformation (one-step GMM) and second-order transformation (two-step GMM). However, there are several disadvantages to the first difference transformation (single-stage GMM). If a variable's current value is absent, for example, translating the first difference (subtracting the variable's past value from its current value) can result in the loss of too many observations. The poor performance of various estimators in such conditions, according to Blundell and Bond (1998), could be related with the usage of substandard tools; as a result of this scenario, A GMM method is relevant since it presents a formula as a level containing initial variations as instrumentation.

Arellano and Bover (1995) and Blundell and Bond (1998) advised the use of a second-

order transformation to mitigate potential data loss owing to the internal transformation problem with the first step of GMM (two-stage GMM). A two-step system GMM estimator using a weighting matrix using first-pass residuals should be utilised when heteroscedasticity and serial correlation are present. Because this demands greater resilience than a single-step GMM system while being more effective and adaptable over heteroscedasticity with autocorrelation, GMM in two stages is referred to as the augmented difference GMM (Roodman, 2009).

The two-step estimation problem occurs whenever a two-step estimator yields similar feature estimations yet uneven standard errors. Two-step estimators, for example, use step one hassle because all computations are performed concurrently. Furthermore, the use of two-step GMM improves performance but also lessens prejudice or additional unique conditions, allowing one should prevent the unfairness because of the presence of several time delays. Dummies can be removed using the records transformation technique (Roodman, 2009). This would be due to the transformed equation's ability to be considered as a substantial probability, which results in an ML estimator that could possess the same asymptotic accuracy as the direct estimator. The study employed on Arellano and Bover (1995) and Blundell and Bond (1998) two-step GMM estimation methodology, including level or deferred values of the parameters acting as instruments. Under this research, the two-step GMM system estimate strategy is chosen since it is based on Arellano and Bond's (1991) GMM prediction model. The relationship between banks' overall performance, leverage and liquidity as well as independent variables of bank-specific features and macroeconomic influences can be quantitatively stated, as shown in equations 1 to 8.

The first set of equations examines the impact of liquidity on bank performance.

$$ROE_{it} = (\alpha - 1)\Delta ROE_{i,t-1} + \beta\Delta LIQ_{it} + \sum_{ij=1}^n \beta_j \Delta BSV_{it} + \sum_{ij=1}^n \beta_j \Delta MEV_{it} + \beta_3 \Delta Dummy_{it} + \Delta \varepsilon_{it} \quad (4)$$

$$ROA_{it} = (\alpha - 1)\Delta ROA_{i,t-1} + \beta\Delta LIQ_{it} + \sum_{ij=1}^n \beta_j \Delta BSV_{it} + \sum_{ij=1}^n \beta_j \Delta MEV_{it} +$$

$$\beta_3 \Delta Dummy_{it} + \Delta \varepsilon_{it} \quad (5)$$

$$NIM_{it} = (\alpha - 1) \Delta NIM_{i,t-1} + \beta \Delta LIQ_{it} + \sum_{i,j=1}^n \beta_j \Delta BSV_{it} + \sum_{i,j=1}^n \beta_j \Delta MEV_{it} + \beta_3 \Delta Dummy_{it} + \Delta \varepsilon_{it} \quad (6)$$

$$Z_Score_{it} = (\alpha - 1) \Delta Z_Score_{i,t-1} + \beta \Delta LIQ_{it} + \sum_{i,j=1}^n \beta_j \Delta BSV_{it} + \sum_{i,j=1}^n \beta_j \Delta MEV_{it} + \beta_3 \Delta Dummy_{it} + \Delta \varepsilon_{it} \quad (7)$$

The second set of equations examines the impact of leverage on bank performance.

$$ROE_{it} = (\alpha - 1) \Delta ROE_{i,t-1} + \beta \Delta LEV_{it} + \sum_{i,j=1}^n \beta_j \Delta BSV_{it} + \sum_{i,j=1}^n \beta_j \Delta MEV_{it} + \beta_3 \Delta Dummy_{it} + \Delta \varepsilon_{it} \quad (8)$$

$$ROA_{it} = (\alpha - 1) \Delta ROA_{i,t-1} + \beta \Delta LEV_{it} + \sum_{i,j=1}^n \beta_j \Delta BSV_{it} + \sum_{i,j=1}^n \beta_j \Delta MEV_{it} + \beta_3 \Delta Dummy_{it} + \Delta \varepsilon_{it} \quad (9)$$

$$NIM_{it} = (\alpha - 1) \Delta NIM_{i,t-1} + \beta \Delta LEV_{it} + \sum_{i,j=1}^n \beta_j \Delta BSV_{it} + \sum_{i,j=1}^n \beta_j \Delta MEV_{it} + \beta_3 \Delta Dummy_{it} + \Delta \varepsilon_{it} \quad (10)$$

$$Z_Score_{it} = (\alpha - 1) \Delta Z_Score_{i,t-1} + \beta \Delta LEV_{it} + \sum_{i,j=1}^n \beta_j \Delta BSV_{it} + \sum_{i,j=1}^n \beta_j \Delta MEV_{it} + \beta_3 \Delta Dummy_{it} + \Delta \varepsilon_{it} \quad (11)$$

The symbols in these equations are explained in Table 4.3.

Table 4.3: Explanations of equation symbols

Symbols	Meaning of symbols
ROE_{it}	Return on equities of the bank, 'n' where n=12 (number of banks) at time/year 't', where t= (10 years) 2012, 2013, ..., 2021.
ROA_{it}	Return on assets of the bank, 'n' where n=12 (number of banks) at time/year 't', where t= (10 years) 2012, 2013, ..., 2021.
NIM_{it}	Net interest margin of the bank, 'n' where n=12 (number of banks) at time/year 't', where t= (10 years) 2012, 2013, ..., 2021.
Z_Score_{it}	The Z-Score $_{it}$ is the bank performance adjusted for risk Z-Score $_{it}$ for bank 'i', where i=12 (number of banks) at time/year 't', where t= (10 years) 2012, 2013, ..., 2021.
LEV_{it}	Bank leverage ratios as measured by DER, TDR, LTDR, and STDR at time t for bank i
LIQ_{it}	Bank liquidity ratios as measured by NSFR, LCR and CR at time t for bank i
BSV_{it}	The 3X1 vector of the matrix for individual bank characteristics (size, NPL and BCR) for the bank "n", where n=12 at time/year, 't' where t= (10 years) 2012, 2013, ..., 2024.
MEV_{it}	The 4X1 vector of the matrix for macro-economic variables (RGDP, INF, IR and ER) for the bank "n", where n=12 at time/year, 't' where t= (10 years) 2012, 2013, ..., 2024.
$Dummy_{it}$	The Dummy variables that take a value of 1 for the COVID-19 period (year 2020 & 2021) or 0 pre-COVID-19 period (from 2012 to 2019)
α	Constant term or intercept (formula).
β	represents the coefficient for independent variables

ε_{it}	is a random error term, which breaks down into: $\mu_i + \nu_{it}$. Where μ_i represents the time-invariant bank-specific effect, while ν_{it} represents the remainder of the disturbance in the estimated regressions.
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Sources: Author's compilation

Despite the fact that there is a lot of research on banks profitability which suggests that rules are one of the determinants of financial performance, majority of the hypotheses and empirical models provide clues on how leverage and liquidity influence profitability. Bank profitability is an outstanding demonstration that has been contextualized and experimentally validated (Taranhike, 2017).

4.7 FORMAL TESTS OF SPECIFICATION FOR PANEL DATA

4.7.1 Multicollinearity

Multicollinearity exists when two or more are correlated not only with the dependent variable but with each other as well (Shresta, 2020). The existence of multicollinearity distorts the results of the study as it makes some variables to be statistically insignificant (Shresta, 2020). Luvuno (2018) cites Gurati (2004) indicating that multicollinearity should be detected. The main techniques for detecting multicollinearity are Correlation Coefficients and Variance Inflation Factor (VIF), according to Shresta (2020). If the Pearson correlation coefficient among variables is close to 0.8, multicollinearity exists. Variation Inflation measures the extent variance of the estimated regression coefficient is inflated (Shresta, 2020).

$$VIF = \frac{1}{1 - r^2}$$

VIF = 1 indicates that independent variables are not correlated to each other, and VIF > 5

indicates a greater correlation (Shrestha, 2020).

4.7.2 Heteroscedasticity

According to Rosopa et al., (2013), heteroscedasticity refers to a phenomenon where data is not consistent with statistical assumption, which is noted as; $\text{Var}(u_i | X_i) = \sigma^2$. Luvuno (2018) said that Choon et al., (2013) writes that heteroscedasticity occurs when the variance of the error term is not consistent across observations. If heteroscedasticity is not detected, resolved results of regression testing will be incorrect. Heteroscedasticity can be detected by visual inspection of scatter diagrams and also the Goldfeld-Quandt Test (Rosopa et al., 2013). In this study, heteroskedasticity was tested using stata.

4.7.3 Autocorrelation

Autocorrelation happens in a time series given the significance of the time sequence (Luvuno, 2018). The error term in time t will be correlated to the error in the period preceding time t . Autocorrelation is important because it affects the validity of inferences related to hypothesis testing and confidence intervals (Huitema, 2006). The most usual way of measuring autocorrelation is by calculating a single coefficient referred to as the Log-1 autocorrelation coefficient (Huitema, 2006). All theoretical exposition in this chapter is applied in the data collection, processing and analysis. It thus forms a framework for a practical and systemic approach to the study. The Arellano-Bond test for AR (1) and AR (2) was used to test for autocorrelation.

4.7.4 Cross-sectional Dependence

Several scholars, for example, Robertson and Symons (2000), Pesaran (2004), Anselin (2001) and Baltagi (2005), argue that panel data analysis is most likely to exhibit significant cross-sectional dependence, which may arise due to the presence of common shocks and unobserved components that ultimately become part of the error term, spatial dependence, as well as due to idiosyncratic pair-wise dependence in the disturbances with no particular pattern of common components or spatial dependence.

4.8 DATA RELIABILITY AND VALIDITY

Based on the study by Gill and Johnson (2010), validity is concerned with uniformity, which indicates the amount of agreement between the results obtained several times by using the same measurement tool under similar conditions. Secondary data was verified through browsing a trustworthy and reputable website, for example in the South African Reserve Bank. South African banks were selected for this investigation, and the data was reviewed using particular criteria.

4.9 ETHICAL CONSIDERATION

Ethical considerations are a set of guidelines that should be followed when conducting research. When gathering data, scientists and researchers must constantly follow a set of rules (Bhandari, 2021). Bhandari (2021) further stated that ethical considerations strive to protect research participants' rights, improve research validity, and preserve scientific integrity. These criteria were used to guarantee that the study was carried out ethically.

4.10 CHAPTER SUMMARY

The researcher presented the data collection sources in this chapter. To calculate the determinant factors, both profitability ratio strategy along with macroeconomic statistics were used. Twelve commercial banks from South Africa were used in the study. In this segment, the study also went through how the data were analysed and how measurement testing was determined. In this regard, following segment will go over a statistical treatment, the regression model outcomes, significant breakthroughs, Moreover future research proposals.

CHAPTER 5: DATA ANALYSIS AND DISCUSSION OF RESULTS

5.1 INTRODUCTION

This section presents, evaluates and discusses a study result. An investigation on effects for liquidity and solvency over South African performance of banks utilizing balanced panel data, where each cross-section and each period has its own observations with each indicator. Data were obtained for the 10 years from 2012 to 2022, with cross-section segments of 13 South African commercial banks. A system GMM approach was used to carry out variable testing. The results are presented and discussed in this chapter. The following research objectives were tested:

- To examine the relationship liquidity coverage ratio and bank performance in South Africa.
- To investigate the relationship between the net stable funding ratio and bank performance in South Africa.
- To examine the relationship between leverage and bank performance in South Africa.

In line with the objectives, the following models were tested:

$$PERF_{it} = (\alpha - 1)\Delta PERF_{i,t-1} + \beta_1\Delta LIQ_{it} + \sum_{ij=1}^n \beta_j \Delta BSV_{it} + \sum_{ij=1}^n \beta_j \Delta MEV_{it} + \beta_3 \Delta Dummy_{it} + \Delta \varepsilon_{it} \quad (5.1)$$

$$PERF_{it} = (\alpha - 1)\Delta PERF_{i,t-1} + \beta_1\Delta LEV_{it} + \sum_{ij=1}^n \beta_j \Delta BSV_{it} + \sum_{ij=1}^n \beta_j \Delta MEV_{it} + \beta_3 \Delta Dummy_{it} + \Delta \varepsilon_{it} \quad (5.2)$$

Twelve outputs emanated from each equation as PERF represented four performance measures inform of ROA, ROE, NIM and Z-Score, while LIQ represented three liquidity measures including CR, NSFR and LCR, and LEV represents three proxies for leverage which included TDR, STDR, and LTDR.

Firstly, the descriptive statistics are presented and discussed in a bid to comprehensively describe the variables used in this study. Secondly, the correlation analysis is done to

determine how the variables are related on a one-to-one basis. Finally, the results from the estimation models are presented and discussed relative to theoretical literature and empirical literature. In some cases, theoretical, policy, practical, and/or social implications of the results are discussed.

5.2 DESCRIPTIVE STATISTICS

The study employed secondary data for analysis. Therefore, descriptive statistics are crucial as it is the best way to visualise raw data and understand what it is showing. Descriptive statistics enable the presentation of data in a more meaningful way, which allows a simpler interpretation of the data. According to Creswell (2014), descriptive analysis of data for study variables includes showing the results through averages, standard deviations, and range of scores. According to Table 5.1, Data is displayed in the following formats: mean, maximum, minimum, standard deviation, observation, and coefficient variation. After the information have been prepared for analysis, descriptive statistics are presented. 110 observations altogether were utilized in the research.

Table 5.1 illustrates the dependent variables ROA and ROE, which were used to evaluate the profitability of South African banking. The measure of bank profitability indicated the mean of all variables from 3.15 as a minimum for ROA and 28.60 as a minimum for ROE, which are indicators of the firm's performance. These results indicate that South African banks generated a profit of 3.15% on average for ROA and 28.60 % for ROE throughout the study's timeframe under consideration after they made financing of 1.38 % of their borrowing through debt and 5.19% as equity.

Return on assets (ROA) measures how well a company uses the assets it owns to generate profits. ROA is calculated by dividing the company's net income by the total assets. A higher return on assets suggests that a company is more profitable and efficient. The average ROA was found to be 3.15%, which was higher than the (Kana, 2017) average ROA of 2.29% and the (Marozva, 2017) average ROA of 3%, with a minimum of 0.03% and a maximum of 17.81%. The standard deviation of ROA was 2.85%.

Table 5.1 Descriptive statistics of variables: 2012-2022

Variables	Mean	Median	Maximum	Minimum	Std, Dev,	Skewness	Kurtosis	Observations
ROA	3.15	2.19	17.81	0.03	2.85	2.63	11.60	110
ROE	28.60	22.19	230.93	0.45	33.73	4.32	23.19	110
NPL	1.16	0.60	9.11	- 0.11	2.00	2.55	8.30	110
Z-SCORE	35.99	35.75	107.41	1.43	28.18	0.74	2.59	110
SISE '000	424,000,000.00	66,849,693.00	1,660,000,000.00	2,997,923.00	508,000,000.00	0.77	2.12	110
TDR	7.84	7.80	9.17	6.42	1.03	- 0.00	1.24	110
LTDR	7.06	7.29	8.53	4.28	1.28	- 0.29	1.62	110
STDR	7.60	7.55	8.99	5.54	1.02	- 0.01	1.35	110
CR	1.38	1.41	2.56	0.01	0.27	- 0.02	12.25	110
LCR	1.67	1.61	3.91	1.04	0.40	2.37	12.66	110
NSFR	0.24	0.29	0.50	0.01	0.12	- 0.34	2.09	110
INF	4.60	4.70	5.60	3.10	0.85	- 0.42	1.92	110
IR	3.89	3.71	5.89	2.31	1.09	0.39	2.27	110
RE	1,283.97	1,327.34	1,645.91	820.99	243.84	- 0.52	2.26	110
NIM	4.99	4.34	21.32	0.07	3.89	2.41	9.03	110

Source: Authors' computation

ROE assesses a company's ability to convert equity capital into net profit. The return on equity (ROE) of a corporation is computed by dividing its net income by the entire value of its shareholders' equity. ROEs of 15-20% are often seen as favourable. A higher return on equity suggests that a company is more profitable and efficient. The average ROE was found to be 28.60%, with a minimum of 0.45% and a maximum of 230.92%. The standard deviation of return on assets was 33.73%. Nishanthini (2015) discovered a mean ROE of 27.40%, which was lower than the researchers' findings.

The NIM is a measure of a bank's financial stability. Net Interest Margin is a profitability ratio used by banks to determine a firm's success in investing in comparison to the expenses on the same investments. The difference between what a bank is making from interest on loans and what it is spending on interest on deposits is known as the net interest margin (NIM). It is calculated as investment income minus interest expenses divided by average earning assets. The average net interest margin (NIM) was 4.99%, with a minimum of 0.07%, a maximum of 21.32%, and a standard deviation of 3.89%. Due to the reduction in central bank interest rates brought on by the COVID-19 epidemic, the average NIM is lower than it was (Khoza, 2020), which was 6.96%. The mean, minimum, and maximum percentages were all positive, indicating that all the banks under review were profitable during the study period.

A Z-score describes the position of a raw score in terms of its distance from the mean when measured in standard deviation units. The Z-score is positive if the value lies above the mean, and negative if it lies below the mean. The average Z-score was 35.99%, and the median was 35.75%, which was close to the average. The standard deviation was 28.18%, with a minimum of 1.43% and a maximum of 107.41%.

The mean non-performing loan ratio (NPLR) of all banks over the test period was 1.16. This implies that banks would be unable to recoup 1.16 per cent of each loan made. The standard deviation recorded based on the non-performing loan ratio was 2.00. The highest non-performing loan ratio was 9.11 and the lowest was 0.11.

For the time period covered by the study, the average liquidity coverage ratio (LCR) were 1.67; the minimum and maximum values were 1.04 and 3.91, respectively, with a standard deviation of 0.40. Even in cases where a funding gap was likely, the banks'

average LCR indicated that they kept a greater proportion of high liquidity assets. A value above one is regarded favourably by Basel iii since it denotes high-quality resources but also indicates that banks would be capable of meeting their current responsibilities. Since it is more than 1, A median ratio of 1.67 is a solid ratio, and banks were able to clear their quick debt before 30 days on average, while an average NSRF were 0.24, with a minimum of 0.01, a maximum of 0.50, and a standard deviation of 0.12 with a negatively skewed value of -0.34. CR had a mean of 1.38, a maximum of 2.55 and a minimum of 0.01 with a standard deviation of 0.27. The average CR of Nishanthini's (2015) research was lower than that of the researchers' study at 1.09.

Measurements of the leverage indicator include STDR, LTDR, and TDR. The average STDR and LTDR ratio in the South African banking sector was 7.60:7.06, suggesting that the country's banking sector can repay its debts. Although the standard deviation was 1.02: 1.28. The STDR and LTDR were 5.54: 4.28 at the minimum and 8.99 and 8.53 at the maximum. The STDR and LTDR indicate how much of the capital structure is made up of debt. A borrowing component TDR average makes up 7.84% of the capital structure in the South African banking sector, with a standard deviation of 1.03%. The spectrum from the smallest to the largest was 6.42 to 9.17. These findings suggested that there is less leverage in the South African banking industry.

5.3 CORRELATION ANALYSIS

The emphasis in this section is on evaluating the correlations between the variables used in this study. Table 5.2 shows the correlations between the variables used. A static model is specified to examine the relationship between liquidity, solvency, and financial performance. The major dependent variables were ROA, ROE, and NIM. TDR, LTDR, and STDR were the independent variables used to quantify leverage, whereas CR, LCR, and NSFR were used to measure liquidity. CAR and NPL are two more research independent variables. This study's correlations are less than 80%, hence there is no evidence of a multicollinearity issue.

Table 5.2 Correlation matrix between dependent and independent variables

PROBABILITY	ROA	ROE	NIM	Z_SCORE	TDR	LTDR	STDR	CR	LCR	NSFR	CAR	NPL	INF
ROA	1.000000												
ROE	0.7831***	1.000000											
NIM	0.5619***	0.2437**	1.000000										
Z_SCORE	-0.2926***	-0.3282***	0.025145	1.000000									
TDR	-0.0633	-0.004474	-0.08018	0.014551	1.000000								
LTDR	-0.08765	-0.019262	-0.09709	0.020806	0.9769***	1.000000							
STDR	-0.03616	-0.007508	-0.06311	0.000903	0.9478***	0.9059***	1.000000						
CR	-0.1318	-0.2313**	0.2834***	0.122217	0.068156	0.094779	0.039627	1.000000					
LCR	-0.12075	-0.1893*	0.2930***	-0.0597	0.029849	0.035951	0.025286	0.7836***	1.000000				
NSFR	0.4006***	-0.2266**	-0.05589	-0.08505	0.029321	0.036619	-0.001997	0.5859***	0.7432***	1.000000			
CAR	0.4262***	-0.1916*	0.4305***	0.102408	-0.081105	-0.094841	-0.028891	0.060453	-0.017435	-0.4081***	1.000000		
NPL	0.3644***	0.111454	0.8862***	-0.021617	-0.056801	-0.066022	-0.053891	0.5212***	0.6200***	0.2562***	0.2622***	1.000000	
INF	0.141641	0.110334	0.105425	0.033310	0.017229	0.025378	-0.009743	0.1698*	-0.003056	-0.103135	0.086579	0.074752	1.000000

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ level of significance

TDR, LTDR, and STDR are the debt variables evaluated by leverage ratios and harmed the bank performance (ROA) due to a negative correlation (-0.0633), at 1% threshold of relevance of ROA with TDR. Additionally, ROA and LTDR had an adverse connection (-0.0877) at the 1% level of importance. Furthermore, in this study, the short-term debt ratio (-0.0362) is negatively related to return on assets at a 1% significance level. According to the analysis, if banks use short-term financing, such as deposits from customers more than other sources of finance, their profitability will decrease. Based on the results, short-term financing is expensive and, therefore, should not be relied upon by companies for financing.

A correlation of less than 80% suggests that there is no problem with multicollinearity, while a correlation of more than 80% is regarded almost perfectly correlated. As per Wooldridge (2008), multicollinearity is deemed problematic if coefficients amongst independent variables exceed 80%.

Intriguing findings are produced by the dependent and independent variables' connection. Liquidity variables like CR, LCR, and NSFR have a detrimental impact on bank performance. Consequently, ROA and CR have an inverse relation at the 1% level of statistical significance (-0.1318). Additionally, ROA and LCR have an unfavourable interaction (-0.1208) at the 1% significant level. Furthermore, it has a drawback association amid ROA as well as the NSFR with a value of -0.4006.

At the 1% significance level, a ROA of -0.2938 is negatively correlated with the firm size (firm size). As a result, the firm's size harms its performance. ROA is positively related to CAR (0.4262) and NPL (0.3644). According to Ozili (2018), investigation of NPL several factors contribute to aggregate non-performing loans, such as bank efficiency, bank concentration, foreign bank presence, unemployment rate, and banking sector size; however, a higher level of government effectiveness, strong competition, and strong legal systems reduced the persistence of non-performing loans after the financial crisis, while Beck et al., (2015) stated that the lower the NPL level, the better.

ROE and TDR have an inverse relation with a score of (-0.004474), while ROE and LTDR have an inverse relationship with a value of (-0.0193). Furthermore, ROE and STDR are negatively associated with (-0.0075). The correlation results between return on

equity and the three independent variables measuring bank leverage are all consistent in terms of relationship with return on equity. Return on equity is negatively related to the short-term debt ratio, long-term debt ratio, and total debt ratio. At a 1% significance level, firm size remains negative and statistically insignificant to banks' profitability.

The impact of liquidity variables such as CR, LCR, and NSFR on bank performance varies. As a result, there is a negative relationship between ROE and CR at the 1% level of significance (-0.2313), while ROE and LCR have a positive relationship of (0.01893) when relevance is set at 1%. Moreover, the biased relationship exists involving either NSFR or ROE with a value of -0.2266. Muriithi and Waweru's (2017) liquidity results using LCR and NSFR were also inconsistent. Furthermore, contrary to the researchers' findings, Nishanthini (2015) discovered a positive relationship between CR and ROE.

An inverse correlation exists between ROE and CAR (-0.1916), while ROE has a positive relationship with NPL (0.1115). ROE has a significant and inverse relationship with CAR. The ROE coefficient indicates that an increase in profitability reduces bank capital. Meconnen (2015) also discovered that return on equity harms capital adequacy.

Using the NIM model, it was found that the independent variable of TDR (-0.0802), STDR (-0.0631) and LTDR (-0.0971) was statistically insignificant and negatively correlated with the NIM variable. The researchers' results are consistent with those of Munangi and Sibindi (2020) who found a negative link between bank leverage and financial performance.

The NIM model shows that the independent variable of CAR is statically significant and positively related to the NIM variable by (0.4305). The findings are consistent with previous research (Oyetade et al., 2022).

There is a negative comparison of NIM and NSFR (-0.0559), while NIM is positively related to CR (0.2834) and LCR (0.2930). The discoveries of the researchers are consistent with those of El Charef et al., (2022) and the liquidity ratio has a strong impact on NIM. Similarly, Muriithi et al. (2016) discovered that NSFR is negatively related to bank profitability, while CAR was found to be a positive significant variable to NIM (0.4305), The researchers' results are consistent with those by Mokhele (2021).

Using the Z-score we found that TDR (0.0146), LTDR (0.0208), and STDR (0.0009) all had positive and significant impacts on bank profitability (Z-SCORE). Studies by Hossaina et al., (2018) provide similar results where the leverage has a significant and positive association with Z-score in BRICS countries.

The findings of this study established that LCR (-0.0597) and NSFR (-0.0850) were negatively correlated to Z-score, while the Z-score was positively correlated to CR (0.1222). Contrary to the researchers' findings, Giordana and Schumacher (2017) found that the LCR and NSFR significantly affected the Z-score positively.

Z-score is positively impacted by CAR (0.1024). In addition to the findings of this study, similar findings were reported by other studies (Adesina & Mwamba, 2016; Papadimitriou et al., 2020). According to the researchers' statistics, NPL (-0.0216) and Z-score are negatively correlated. NPL and Z-SCORE have also been found to be negatively correlated (Nyarko-Baasi, 2018).

5.4 EMPIRICAL FINDINGS

In this section, empirical findings are presented and discussed. The first section presents a discussion of the diagnostic statistics for all the models. In the second section, the relationship between liquidity and bank performance is put into perspective. The third section exhibits the outcomes and discussion in terms of the interaction of leverage With financial institution results. Lastly, the summary of the chapter is presented with a discussion focusing on the main findings of the study.

5.4.1 Diagnostic statistics

The general panel data model: fixed effects, random effects, and pooled OLS were tested for various diagnostic statistics. The various tests performed included the heteroscedasticity test, the specification test introduced by Hausman (1978:1251), A joint validity test for cross-sectional individual effects, and the LM testing of random effects (Breusch & Pagan, 1980: 239).

The first test was to analyse the pool ability or individual effects as well as the validity of cross-sectional evaluation that use the Chow test or F-test. The Breusch Pagan (1980:

239) Lagrange Multiplier (LM) practice was performed as the second check. The Hausman (1978:1251) test was used as the third test to determine if the fixed effects or random effects model should be employed. According to Hausman (1978:1251), the favoured model among the null hypotheses in the test was random effects, and the fixed effects model was the competing theory for the recommended framework. A homoscedasticity test was conducted as the fourth test. Lastly fifth test was the cross-sectional interdependence test.

Since convenience sampling was utilizing the FE model could have been the recommended method, however instead of using FE, the generalised method of moments (GMM) was applied to address an issue with endogeneity and specification errors associated with dynamic models. Holtz-Eakin et al., (1988) as well as Arellano and Bond (1991) developed the GMM in order to deal with endogeneity and specification problems in regression analysis that the OLS or FE technique was unable to correct. The study used dynamic panel GMM estimators in this analysis to take into account the endogeneity of the lagged dependent variable and independent variables (Arellano & Bond, 1991; Arellano & Bover, 1995; and Blundell & Bond, 1998). Therefore, lagged independent variables were used as instruments and in some instances, the dependent variable was lagged twice as an instrument to the lagged dependent variable.

Some of the models exhibited some problems of heteroscedasticity and cross-sectional interdependence. However, these problems were resolved using the GMM model with the Driscoll and Kraay Standard Errors estimator. A diagnostic test results for Tables 5.3 to 5.10 are presented in the appendix.

5.4.2 Analysis of the relationship between liquidity and bank performance

This section presents an analysis of the relationship between performance and liquidity.

The analysis conceptual framework is based on the following diagram:

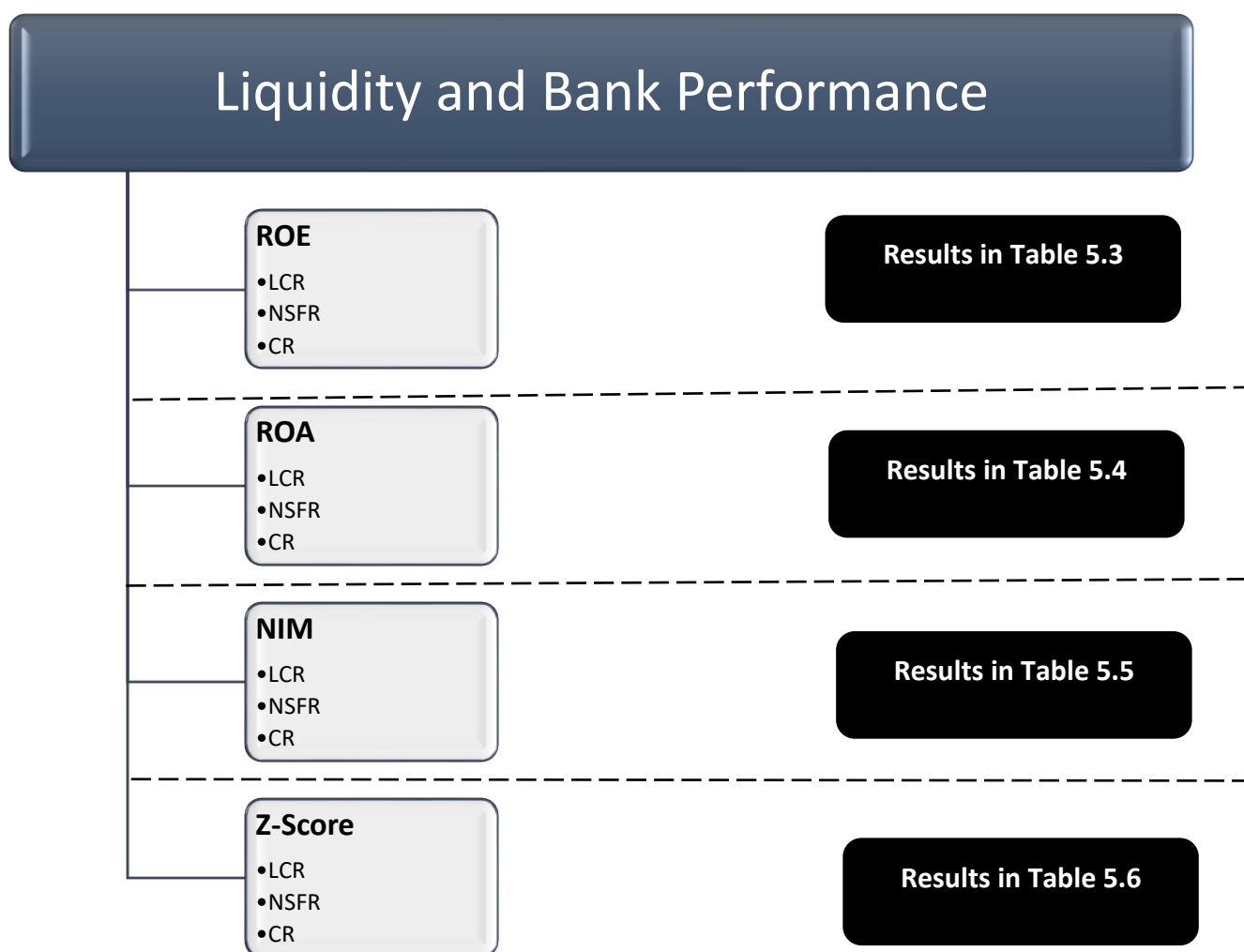


Figure 5.1: Conceptual framework– Relationship between liquidity and bank performance

Source: Own compilation

Table 5.3: Determinants of Banks' return on equity: Effects of liquidity

Variables	2-Step System GMM	2-Step System GMM	2-Step System GMM
	ROE	ROE	ROE
L.ROE	0.744*** (0.0210)	0.467*** (0.0332)	0.632*** (0.0219)
CR	-17.54* (8.450)		
LCR		-27.18* (11.78)	
NSFR			-169.5*** (44.78)
NPL	4.142** (1.530)	2.909 (4.720)	-0.0363 (4.735)
CAR	-1.681* (0.670)	-10.61*** (1.607)	-4.024*** (0.860)
LSIZE	-44.21* (19.76)	-108.3*** (28.82)	-54.93** (18.38)
GDPG	-0.246 (0.140)	0.238 (0.156)	-0.0162 (0.127)
IR	1.234* (0.542)	0.785 (2.313)	1.002 (0.815)
COVID-19	7.376*** (1.046)	11.15* (5.611)	8.817*** (2.154)
<i>N</i>	88	88	88
<i>Groups</i>	11	11	8
<i>Instruments</i>	10	10	11
<i>AR (1)</i>	-1.04	-1.19	-1.01
<i>AR (2)</i>	-1.21	0.77	-0.05
Sargan test	6.40	11.84	7.62
Hansen test	4.50	4.54	2.20

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.3 summarises the results of a regression study comparing bank performance as measured by ROE and independent variables. The following depicts the connection between ROE and CR, LCR & NSFR as well as other control factors. The objective of this study was to examine the relationship between CR, LCR, NSFR, and bank performance. An estimation result can be seen in Table 5.3, with an indication that a positive correlation exists among the previous researchers' ROE and the estimation result.

There is persistence in the performance. The results of Marozva (2017) confirm that ROE depends on the level of the previous ROE. In this study, high liquidity hurts bank performance but the findings are not following theoretical predictions. Marozva (2015), Marozva (2017) and Khoza (2020) found an inverse correlation between liquidity and bank performance, meaning low liquidity results in higher bank performance. According to the study's findings, performance is significantly and negatively correlated with CR, LCR & NSFR. These results show that banks with low liquidity (CR, LCR & NSFR) are associated with higher performance, and banks with high liquidity correlate with low ROE. These findings are consistent with those of Charmier et al. (2018), Dahiyat et al., (2021) and Marozva (2015), who found a negative connection between performance and liquidity.

This finding contradicts the current study of a positive correlation between CR and ROE which was discovered by Hossain and Alam (2019). Khan and Ali (2016) also discovered a significant correlation involving profit and liquidity. Using a current ratio as an independent variable, both researchers found that liquidity had a positive connection to performance.

Tobin (1956) developed his liquidity preference hypothesis, which depicts the relationship between interest rates and demand for money as a preference for holding wealth in money form, which is a safe and riskless asset. Furthermore, he contends that when interest rates rise, wealth holders will be enticed to invest a bigger portion of their assets in bonds, reducing their holdings of cash. In general, the profitability of banks and liquidity are inversely correlated; as liquidity increases, profits decrease (Marozva, 2015).

Size, CAR, and ROE are all inversely correlated. In other words, performance of bank's

declines as bank grows in size. This proposes that larger institutions prioritise goals other than profit-making whereas smaller banks, which are still expanding, prioritise profit-making. These outcomes align with Taranhike (2017), while banks with lesser capital tend to take more risks and outperform those with higher capital in terms of ROE and risk-taking, respectively (Yusuf & Ekundayo, 2018).

The findings also show that there is a substantial positive association with NPL and IR, implying that when interest rates are high, borrowers are less likely to return their loans, increasing non-performing loans. This observation is congruent with those of Sheefeni (2016), who discovered a positive correlation involving NPLs and interest rates. Banks can become more profitable when real interest rates are higher (Alpera & Anbar, 2011). According to Fathi et al., (2012) findings, interest rate risk has a positive correlation with ROE. In the next section, the researchers explore the relationship between return on assets and liquidity.

Table 5.4: Determinants of Banks' return on assets: Effects of liquidity

Variables	2 Step system GMM	2 Step system GMM	2 Step system GMM
	ROA	ROA	ROA
L.ROA	0.310* (0.117)	0.255*** (0.0411)	0.283*** (0.0613)
CR	4.801 (4.268)		
LCR		-2.448** (0.944)	
NSFR			-14.02*** (1.915)
NPL	1.668** (0.529)	0.905*** (0.174)	1.784*** (0.410)
CAR	0.347 (0.483)	0.115 (0.121)	0.00378 (0.0838)
LSIZE	7.155* (3.027)	1.991 (1.803)	3.421 (2.699)
GDPG	-0.0365 (0.0426)	0.0209 (0.0390)	0.00323 (0.0776)
IR	-0.129 (0.199)	-0.247* (0.0991)	-0.0564 (0.170)
COVID-19	0.106 (0.646)	-0.631* (0.262)	-0.218 (0.738)
<i>N</i>	88	88	88
<i>Groups</i>	11	11	11
<i>Instruments</i>	10	10	10
<i>AR (1)</i>	-1.48	-1.46	-1.54
<i>AR (2)</i>	1.07	1.04	0.79
Sargan test	1.56	9.83	14.07
Hansen test	0.71	4.36	2.08

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

According to Table 5.4, a regression analysis was performed between ROA and independent factors determining bank performance. A relationship between LCR, NSFR and ROA is represented in the equation, along with other variables that provide control. Study objectives included examining the relationship between LCR, NSFR, and bank performance. ROA is used as a metric for measuring performance. The estimation results in Table 5.4 indicates a negative relationship between the previous researchers' ROA and the estimation result (See, for example, Psillaki & Georgoulea, 2016; Dahiyat et al., 2021; Doan & Bui, 2021).

Dahiyat et al., (2021) observed a negative but negligible influence of liquidity measured by the current ratio on performance, implying that liquidity is not regarded as a significant element in Jordanian financial performance, while Doan and Bui (2021) also found a negative relationship between ROA and liquidity. This demonstrates that having more liquid liabilities may prevent banks from taking advantage of as many business opportunities, which might result in lower profitability during the time frame examined (2013 to 2018). Vietnamese banks have focused on maintaining a high liquidity ratio. As a result, performance could be negatively affected.

Based on Table 5.4, a significant inverse relationship exists between LCR, NSFR, and ROA. In other words, when liquidity increases, performance decreases. Similar results have been found by Muriithi and Waweru (2017) that liquidity is negatively correlated with return on assets. Additionally, Psillaki and Georgoulea (2016) discovered that the liquidity ratio (NSFR and LCR) has a detrimental effect on ROA. This could be explained by the fact that the Greek banking system's funding model is significantly more homogeneous when compared to other banking systems, with less reliance on interbank lending and a greater reliance on more stable types of funding, particularly deposits.

The findings of the researchers varied. Profitability and liquidity have a positive relationship, according to Khan and Ali (2016) and Nabeel and Hussain (2017). Researchers that found positive results used the current ratio and quick ratio as the liquidity measure while researchers that use LCR and NSFR results were negative.

Size and NPL are positively related to performance as measured by ROA. These results

confirm Li and Zou's (2014) findings that nonperforming loans have a positive influence on bank profitability as measured by return on assets (ROA). Large to medium banks, according to the research, have a higher return on assets (ROA) than smaller banks. As a result, the research identified a link between bank size and performance in Kenya (Alex & Ngaba, 2018).

The interest rate in the current study is positively related to liquidity and negatively related to ROE. A lower interest rate led to lower liquidity. The research is in line with Mohammadi and Jalilian (2018) study which found a direct relationship between interest rates and liquidity in companies listed on the Tehran Stock Exchange. Using independent variables and bank-specific variables, Table 5.5 below shows the results of an analysis of NIM and Liquidity.

Table 5.5: Determinants of Banks' NIM: Effects of liquidity

Variables	2-Step System GMM	2-Step System GMM	2-Step System GMM
	NIM	NIM	NIM
L.NIM	0.0678 (0.116)	0.221** (0.0707)	0.393** (0.128)
CR	3.666* (1.457)		
LCR		2.311* (1.117)	
NSFR			6.137* (2.807)
NPL	2.828*** (0.586)	2.016*** (0.394)	1.308*** (0.339)
CAR	-0.0631 (0.110)	0.238** (0.0758)	0.681** (0.213)
LSIZE	-3.830* (1.525)	1.127 (2.201)	2.188 (1.503)
GDPG	0.0126 (0.0179)	0.0435 (0.0345)	0.00680 (0.0141)
IR	0.349*** (0.0967)	0.190 (0.119)	0.184* (0.0784)
COVID-19	1.586*** (0.460)	0.0114 (0.483)	0.169 (0.224)
<i>N</i>	88	88	88
<i>Groups</i>	11	11	11
<i>Instruments</i>	9	10	10
<i>AR (1)</i>	0.405	-0.30	-0.99
<i>AR (2)</i>	-0.83	-0.12	-0.95
Sargan test	9.41	6.76	2.11
Hansen test	1.85	1.74	0.59

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The results of the regression research on the relationship with both independent variables and bank performance as assessed by ROE are summarised in Table 5.5. The equation depicts the relationship between NIM and liquidity, as well as other control variables. The purpose of this research was to investigate the relationship between CR, LCR, NSFR, and bank performance. NIM is a performance metric. Liquidity and Performance were found to be positively correlated in the current study.

Results demonstrate that banks' NIMs start to increase as liquidity (CR, LCR, and NSFR) increases, which is in line with the findings of Dang (2021), higher NSFR levels have a positive effect on performance and increase the bank's net interest margin. Moreover, Charmier et al., (2018) study also revealed that bank liquidity and profitability are positively correlated.

This result deviates from the existing research's assertion that liquidity and performance are positively correlated. According to Sidhu et al., (2022) findings, the NIMs of banks are significantly negatively correlated with both LCR and NSFR, while Pak (2020) stated that the implementation of NSFR would result in a decrease in bank NIMs.

According to Bourke (1989), there is a positive and significant relationship between bank liquidity and profitability. Additionally, Nishanthini and Meerajancy (2015) also discovered a positive correlation between profitability and liquidity. Agreeing with the direct correlation, Le and Phan (2017) observed a direct relationship between liquidity and profitability. Mugetha (2019) investigated the impact of liquidity on the firm performance of listed companies on the Nairobi Securities Exchange and recommended that firms have more liquid assets to assist in determining the financial well-being of future investments.

This study looked at how interest rates and NIM relate, and it discovered a positive association. According to Klomp and De Haan (2015), in general, the lend-long borrowing short-term argument, the lending interest rate, or real interest rate, is expected to have a positive correlation with profitability. Kana (2017); Charmier et al., (2018) found similar positive results between interest rates and bank performance.

The results of a Z-score and Liquidity data analysis are presented in Table 5.6 using independent variables and bank-specific variables.

Table 5.6: Determinants of Banks' Z-score: Effects of liquidity

Variables	2-Step System GMM	2-Step System GMM	2-Step System GMM
	ZSCORE	ZSCORE	ZSCORE
L.ZSCORE	-0.244 (0.293)	0.329 (0.221)	-0.138 (0.215)
CR	-2.454 (2.907)		
LCR		-7.847** (3.548)	
NSFR			-7.091 (30.25)
NPL	-9.646* (4.702)	-0.415 (3.886)	-7.418* (3.760)
CAR	1.796** (0.577)	1.238* (0.529)	1.428** (0.534)
LSIZE	4.061 (4.584)	18.40* (7.246)	4.516 (9.777)
GDPG	0.242* (0.0947)	0.0710 (0.0873)	0.173* (0.0722)
IR	-1.599*** (0.415)	-1.136** (0.424)	-1.283*** (0.273)
COVID-19	-4.866** (1.728)	-3.876* (1.674)	-3.621*** (1.080)
<i>N</i>	88	88	88
<i>Groups</i>	11	11	11
<i>Instruments</i>	20	22	20
<i>AR (1)</i>	-0.66	-0.62	-0.69
<i>AR (2)</i>	-0.87	-0.65	-1.13
Sargan test	11.27	12.32	5.73
Hansen test	2.76	2.74	3.80

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Z-score and independent factors influencing bank performance were analysed in Table 5.6. This equation represents a relationship between LCR and Z-score along with other variables that provide control. The research examined at the connection among LCR and bank performance. Performance is measured using Z-score as a measure of performance adjusted for risk. According to Table 5.6, the previous researchers' estimates are correlated insignificantly positively with the present.

A significant positive relationship exists between performance and LCR. These findings demonstrate that banks with lower levels of liquidity (LCR) have lower performance, however, banks with larger levels of liquidity have higher Z-scores. In line with the researchers' study, Syarif (2021) study on liquidity had a significant positive effect on the Altman Z Score Model. Additionally, the liquidity coverage ratio is positively associated with African banks' Z-score (Obadire, 2022). BaĀci and Kaygin (2022) discovered a positive association between LCR and Z-score, implying that the higher the liquidity level, the better the Altman Z Score and the more successful the firms, but the lower the liquidity, the riskier the financial stability (Z-score).

On the contrary, Giordana and Schumacher (2017), however, found a negative relationship between liquidity and Z-score. Furthermore, Birindelli et al. (2020) stated that in terms of liquidity, LCR does not support bank stability.

The GMM approach was used in this study to estimate the link between bank performance and liquidity. The three independent variables, CR, LCR, and NSFR, were regressed by the researchers. NIM, ROA, ROE, and Z-score were used as bank performance measures. The Z-score and NIM have a direct association with liquidity, whereas ROE and ROA have a negative correlation with liquidity.

5.4.3 Analysis of the relationship between leverage and bank performance

This section presents an analysis of the relationship between leverage and bank performance. Therefore, the analysis conceptual framework is based on the following diagram:

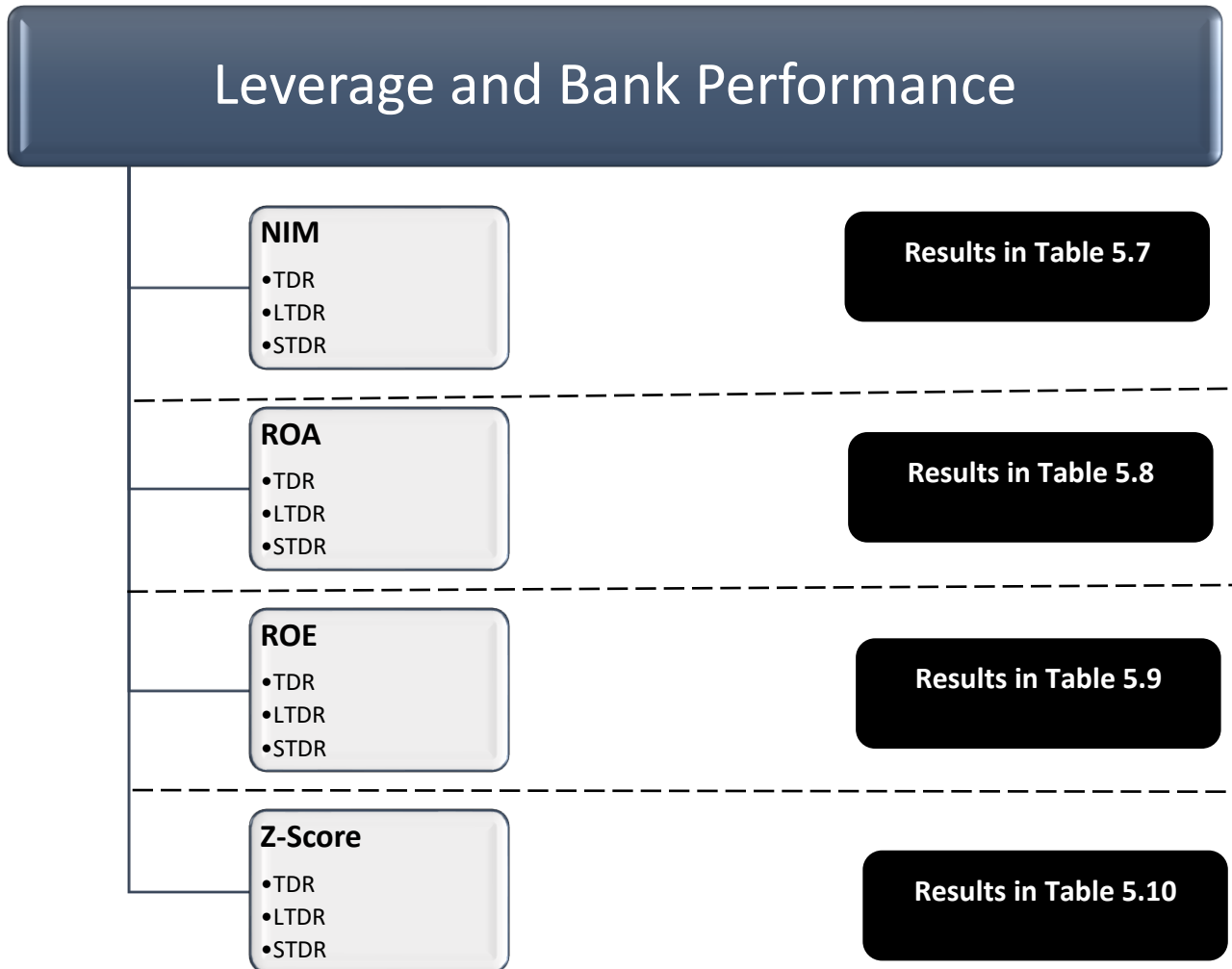


Figure 5.2: Conceptual framework – Relationship between leverage and bank performance

Source: Own compilation

The emphasis in the next section is on analysing the relationships between leverage and NIM as measures of bank performance used in this study. Table 5.8 shows the correlations between the variables used.

Table 5.7: Determinants of Banks' NIM: Effects of leverage

Variables	2-Step System GMM	2-Step System GMM	2-Step System GMM
	NIM	NIM	NIM
L.NIM	0.173*** (0.0249)	-0.144 (0.125)	-0.201* (0.0962)
TDR	-0.321* (0.161)		
LTDR		0.292** (0.0922)	
STDR			0.268** (0.0908)
NPL	1.498*** (0.283)	1.154*** (0.240)	1.268*** (0.353)
CAR	-0.0606 (0.0751)	-0.0653 (0.0935)	0.214 (0.116)
LSIZE	-6.210** (2.118)	-7.046*** (1.744)	-7.394** (2.251)
GDPG	-0.0395 (0.0226)	-0.00178 (0.00875)	-0.0201** (0.00721)
IR	0.371*** (0.0685)	0.154** (0.0502)	0.249*** (0.0345)
COVID-19	1.210*** (0.352)	0.895*** (0.237)	1.024*** (0.195)
<i>N</i>	88	88	88
<i>Groups</i>	11	11	11
<i>Instruments</i>	10	9	8
<i>AR (1)</i>	-1.28	1.16	1.34
<i>AR (2)</i>	-1.08	-1.25	-1.56
Sargan test	8.45	0.24	0.18
Hansen test	2.48	0.34	2.07

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The findings of the regression analysis between the independent variables and bank performance as determined by NIM are shown in Table 5.7. The two-step GMM results are the focus of the analysis because they were the most suitable estimation method. The equation's result shows, among other control variables, how NIM and leverage are related.

Table 5.7 shows a detrimental and significant factor correlation for performance and TDR. The performance of the banks declines as the solvency ratio increases. The well-known solvency management theory, proposed by Myers & Majluf (1984), contends that solvency and performance are negatively correlated. This result confirms Ahmad et al.'s (2015) results, where they also found a negative relationship between leverage and performance. Furthermore, Munangi and Sibindi (2020) also discovered a negative relationship between bank leverage and financial performance in South African banks.

In contrast to the current analysis, Al-Omari (2020) discovered that the solvency ratio had a positive impact on profitability. In addition, Musah (2018) also found a positive correlation between total debt ratios and profitability in banks in Ghana. As a result, the study confirms the pecking order theory, which argues that more profitable firms will prefer to use internal funds over debt, and, therefore, leverage and profitability have a negative relationship.

Concerning profitability, long-term debt ratios and short-term debt ratios are both positively correlated. This implies that the larger the LTDR and STDR, the bank's profitability increases. Modigliani and Miller (1963) incorporated taxes into their model and demonstrated that the profitability of a firm increases as leverage increases due to the tax shield. This is because, as more debt is used, the tax shield reduces the cost of debt. According to the theory, a firm will be in a better position if it uses debt rather than internal capital because it will benefit from debt tax relief. According to the theory, increased solvency results in higher financial performance.

A similar result was found by Gadzo and Asiamah (2018) and ISAH (2019), showing the short-term and long-term debt ratios are positively correlated to bank performance. Moreover, Pradhan and Khadka (2017) also found a positive correlation between banks'

profitability and short-term debt ratios, while long-term debt ratios were contrary and negatively affected profitability.

A regression analysis by Musah (2018) found that short-term and long-term debt ratios are negatively related to bank profitability, contradicting the results of the current study. Andersson and Minnema (2018) results of leverage (LTDR and STDR) were also negatively correlated.

Banks have provided relief payments to more than 30 000 businesses and 1.7 million clients, in addition to temporary job losses and business closures caused by economic lockdowns (SARB,2020).

An increase in NIM leads to an increase in NPL. The relationship between the net interest margin and non-performing loans is positive and significant. However, the financial institution's size is negatively correlated with non-performing loans. These outcomes are comparable with Panta (2018) who also found the same results for NPL, Size and Bank performance. Furthermore, there is a significant positive correlation between banks' size and interest rates. According to Klomp and De Haan (2015), from the perspective of long-term lending and short-term borrowing, the real interest rate is anticipated to be directly correlated with performance. In times of low interest rates, bank margins are reduced, resulting in reduced profitability (Olds & Steenkamp, 2021).

Table 5.8 below presented the results of ROA and Leverage ratio as dependent variables and bank specific.

Table 5.8: Determinants of Banks' return on assets: Effects of leverage

Variables	2-Step System GMM	2-Step System GMM	2-Step System GMM
	ROA	ROA	ROA
L.ROA	0.424** (0.0996)	0.424*** (0.0860)	0.392*** (0.102)
TDR	0.835*** (0.243)		
LTDR		0.790*** (0.175)	
STDR			0.636** (0.297)
NPL	1.379** (0.436)	1.385*** (0.403)	1.426*** (0.372)
CAR	0.318** (0.0828)	0.348*** (0.0923)	0.325*** (0.0792)
LSIZE	5.437 (2.475)	5.485* (2.384)	5.786* (2.261)
GDPG	0.0405 (0.0458)	0.0369 (0.0409)	0.0467 (0.0403)
IR	-0.131* (0.0561)	-0.125* (0.0523)	-0.0991 (0.0540)
COVID-19	-0.783 (0.435)	-0.720 (0.398)	-0.868* (0.415)
<i>Observations</i>	88	88	88
<i>Groups</i>	11	11	11
<i>Instruments</i>	10	10	9
<i>AR (1)</i>	-1.37	-1.32	-1.56
<i>AR (2)</i>	0.87	0.77	0.76
Sargan test	36.55	37.45	33.54
Hansen test	1.68	1.69	1.59

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.8 presents the regression analysis findings between the independent variables and bank performance as determined by ROA. The two-step GMM estimations were the most suited for this research. Among other control variables, the equation's result shows how ROA and leverage are related.

Leverage and ROA are positively correlated with one another, with solvency measured by TDR, LTDR and STDR. Nguyen and Nguyen (2020) study measured solvency and profitability by ROA and displayed a similar relationship. Moreover, Alshatti (2015) discovered that the solvency ratio has a significant impact on profitability since higher levels of financial performance are related to higher levels of solvency. Theoretically, more profitable firms should have higher levels of leverage, implying that there should be a positive relationship between solvency and profitability (Modigliani & Miller, 1963).

On the other hand, Andersson and Minnema (2018) observed a negative, substantial correlation between leverage and profitability. Musah (2018) also found a negative correlation between TDR, STDR and LTDR and performance. According to Myers and Majluf (1984), the pecking order theory predicts contrary associations from the researchers' current outcome.

An expansion in bank size results in a rise in ROA. That is consistent with Alex and Ngaba's (2018) research that banks with large to medium assets have higher returns on assets than those with small assets; according to the findings, bank size and performance are positively related in Kenya, while COVID-19 negatively impacted the profitability of banks, according to the analysis (Fauzi et al., 2022). The results showed a significant positive relationship between ROA and CAR. The results are consistent with those of Khoza (2020). Performance may be improved by reducing working capital, according to a positive correlation between ROA and CAR.

ROA and IR have a negative and significant correlation. These findings conflict to that of Charmier et al., (2018); Kana (2017), which discovered the strong association across ROA with IR. A difference between the two pieces of research may be due to the different populations, independent variables, and study periods used in the earlier investigations.

This negative association may also be influenced by the pandemic (COVID-19).

According to the study, there is a positive correlation between ROA and NPL. In contrast, Kingu et al., (2015) and Khoza (2020) discovered a negative relationship between ROA and NPL. The rise in NPLs has resulted in greater asset write-off costs. This will have an impact on the bank's profitability because income that should have been collected by the bank was not obtained owing to negative credit. The difference might have been that in their investigations, considering distinct independent factors, population, hence this research durations differed from those used in the present research. Additional element that might be contributing to this beneficial association is the payment holiday implemented by the bank during the pandemic. The section that follows explores the link between ROE as well as leverage.

Table 5.9: Determinants of Banks ROE: Effects of leverage

Variables	2-Step System GMM	2-Step System GMM	2-Step System GMM
	ROE	ROE	ROE
L.ROE	0.714*** (0.0189)	0.707*** (0.0157)	0.595*** (0.0615)
TDR	-1.576* (0.701)		
LTDR		-1.238* (0.583)	
STDTR			-3.410* (1.694)
NPL	20.04*** (3.442)	19.15*** (3.697)	21.96*** (4.068)
CAR	-1.861** (0.658)	-1.893*** (0.448)	-4.777** (1.474)
LSIZE	-5.219 (16.96)	-9.610 (15.47)	-49.86 (31.75)
GDPG	-0.151 (0.147)	-0.0223 (0.144)	-0.0622 (0.215)
IR	1.242* (0.593)	0.885* (0.429)	1.118 (0.692)
COVID-19	5.086*** (0.970)	4.116*** (0.831)	8.707*** (1.863)
<i>N</i>	88	88	88
<i>Groups</i>	11	11	11
<i>Instruments</i>	9	10	8
<i>AR (1)</i>	-1.24	-1.26	-1.27
<i>AR (2)</i>	-0.75	-0.59	-0.77
Sargan test	9.61	6.96	59.32
Hansen test	4.25	5.07	2.75

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.9 shows the outcomes of the regression analysis between the independent variables and bank performance as determined by ROE. As they were the most appropriate estimates, the focus of the analysis is on the two-step GMM findings. An equation's outcome, among other control variables, demonstrates how ROE and leverage are related. Financial leverage ratios measured by TDR, LTDR, and STDR are negatively correlated with return on equity (ROE). It suggests that a decrease in solvency increases banks' return on equity, meaning the firm should use reserves created internally, which are retained earnings, followed by debt, and if more funding is needed, assets should be financed through equity capital. This confirms the results of Ahmad et al., (2015) and Nguyen and Nguyen (2020), who found that ROE is adversely related to leverage. According to the solvency management theory developed by Myers and Majluf (1984), performance and solvency are negatively correlated.

Additionally, this research goes against the findings of Haniand and Zouhour (2019), who discovered that short-term debt had a positive and significant impact on a firm's financial performance. Moreover, Solvency variables have a significant positive effect on the profitability of banks (Hariatih & Aziz, 2022).

In Table 5.10, the researchers show the results of the Z-score and Leverage using both independent and bank-specific factors, data analysis was performed to examine the effects on bank performance.

Table 5.10: Determinants of Banks' Z-score: Effects of leverage

Variables	2-step System GMM	2-step System GMM	2-step System GMM
	ZSCORE	ZSCORE	ZSCORE
L.ZSCORE	-0.0884 (0.263)	0.141 (0.138)	-0.208 (0.188)
TDR	1.298 (1.299)		
LTDR		-1.133* (0.471)	
STDR			0.433 (0.667)
NPL	-13.73* (5.557)	-7.388* (3.309)	-12.76** (4.065)
CAR	2.316* (0.982)	1.016 (0.593)	1.852* (0.814)
LSIZE	7.479 (16.01)	9.998 (9.590)	-1.077 (13.99)
GDPG	0.409* (0.205)	0.0807 (0.0963)	0.269* (0.105)
IR	-2.263** (0.694)	-1.455* (0.664)	-1.572*** (0.403)
COVID-19	-5.800* (2.685)	-4.321* (2.185)	-3.938* (1.988)
<i>N</i>	88	88	88
<i>Groups</i>	11	11	11
<i>Instruments</i>	10	10	10
<i>AR (1)</i>	-0.78	-0.71	-0.65
<i>AR (2)</i>	-0.84	-1.16	-1.22
Sargan test	6.02	12.21	3.02
Hansen test	2.54	2.89	1.83

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The results of the regression analysis between the independent variables and Z-score-measured bank performance are shown in Table 5.10. As two-step GMM results were the most suitable estimates, they are the main subject of this investigation. The equation displays the relationship between the Z-score and leverage among other variables to consider.

In relation to Z-score, LTDR has a negative correlation. Results are consistent with the current study that long-term leverage has negative Z-score coefficients (Nguyen & Kien, 2021). The outcomes are in line with M&M theory, while there is a negative correlation between NPL and Z-score, while Septyanto et al., (2022) found that financial distress (Z-score) is negatively influenced by solvency. The result is quite consistent with those of Faye et al., (2013), who indicated higher Z-scores but lower NPL ratios in Islamic banks.

There is a positive correlation between CAR and Z-score. Pradhan and Shrestha (2017) discovered that there was an advantageous connection between the two variables. There was a positive correlation between CAR and Z-score in the study of Aroghene & Ikeora (2022).

The section covers descriptive statistics for the dependent and independent variables. The post-diagnostic statistics were shown, proving that the frameworks were resilient and unaffected through any instruments because the number of instruments is not greater than the number of groups. A panel data was subjected to the GMM two-step regression since being the strongest acceptable approximation methodology. A debate within the section emphasized the link concerning banks profitability, leverage plus liquidity, while comparable, differs based upon a performance quantification or variables employed. A few of those notable findings comprised a negative link between bank performance as evaluated by ROE, ROA, and Z-score with liquidity, while NIM is positively related to liquidity.

Leverage, on the other hand, showed positive results when NIM and ROA were utilised as bank performance measurements. The performance-based ROE and Z-score had a negative connection with leverage. The following chapter will discuss the conceptual underpinnings of the current investigation, together with the conclusions and suggestions.

5.5 CHAPTER SUMMARY

In summary, the study's objectives were addressed using the descriptive and correlation information about the dependent and independent variables. The panel data was subjected to the GMM two-step regression as this was the most suitable estimation method. The GMM was employed in the study to determine the relationship between liquidity, leverage, and bank performance, although the results varied depending on the performance indicator or variable used. The study's objective is to investigate a connection for both liquidity coverage ratio and bank performance in South Africa. In addition, the relationship between the net stable funding ratio and bank performance in South Africa will be investigated. Finally, the relationship between leverage with financial institution results in South Africa will be investigated.

Leverage and bank performance (ROA and NIM) were directly correlated (TDR, LTDR and STDR). The results were negative when using NIM and TDR, ROE and leverage (TDR, LTDR, and STDR), and lastly, Z-score and LTDR had a negative correlation. According to Myers and Majluf's (1984) pecking order hypothesis, adverse correlations are predicted: more profitable firms will have lower leverage, showing an inverse relationship between leverage and profitability.

Bank performance (ROE) and liquidity have a negative relationship. The findings also revealed a negative correlation between ROA and liquidity, while NIM had a positive link with liquidity. Finally, negative relation was revealed by the data between the Z-score and liquidity.

Overall, the findings revealed an inverse relationship between liquidity and bank performance. Furthermore, leverage, on the other hand, had an impact on bank profitability that was both negative and positive. Leverage harms a bank's profitability overall. The subsequent section discusses a summary, conclusion along with research recommendations.

CHAPTER 6: SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

A summary of the study is presented in this chapter, along with findings and recommendations for further study. Additionally, reflections on hypotheses, empirical investigation, and findings about the connection amongst the effects of liquidity and solvency on South African bank performance are provided. These findings were derived based on Chapter 5.

6.2. SUMMARY OF THE FINDINGS

A GMM was applied to address the hypothesis on an interrelationship regards liquid assets, solvency, and performance of banks, that mainly focused on a quantitative study. Panel data were used in favour of time series data with 110 observations to extract year-to-year data. Secondary data extracted from annual reports were gathered. Using system GMM modelling for 10-year panel data from 2012 to 2021, the study tested the hypothesis that the dependent and independent variables are linked to the research goal. During the study, the following objectives were outlined:

- To investigate the connection across liquidity coverage ratio and overall performance of financial institutions in South Africa.
- To Analyse the connections within the net stable funding ratio and bank performance in South Africa.
- To examine the relationship between leverage and bank performance in South Africa.

According to this study, the following findings were found. A regression analysis revealed inconsistent results. The relation between liquidity (NSFR and LCR) and bank

performance depends on the performance measure used. Bank achievement (ROE, ROA with Z-score) was negatively correlated with liquidity, while NIM had a positive relationship with liquidity. Additional bank performance (ROA and NIM) has a direct correlation with leverage except when utilising NIM and TDR, ROE and leverage. Lastly, Z-score and LTDR results were negative. In addition, the outcomes for bank-specific factors demonstrated as underlying: A direct correlation was found between NPL and Performance except when NPL was measured against Z-score, which resulted in negative results. Lastly, the results of LSISE, IR, CAR, and COVID-19 were inconsistent. Results are discussed in detail in the following section.

6.3 IMPLICATIONS OF THE RESULTS

6.3.1 IMPLICATIONS OF LIQUIDITY AND BANK PERFORMANCE

According to the regression results, the following results were obtained. Liquidity as well as bank performance (ROE) have an inverse connection. Bank performance was measured using ROE and liquidity using CR, LCR and NSFR. The outcomes also revealed a negative correlation regards ROA with liquidity, while NIM as measured by bank performance had a positive relationship with liquidity. Lastly, a negative correlation between the Z-score and liquidity was obtained from the results.

In relation to bank performance, liquidity had a negative and significant impact. There is no difference between these results and those reported previously by Marozva (2015, 2017), Khoza (2020), Dahiyat et al., (2021) and Charmier et al., (2018). According to these results, banks with low liquidity perform better and banks with high liquidity have low bank performance. Higher liquid asset holdings decrease the bank's capacity to generate interest income (Tan, 2017).

However, there was a positive correlation between performance (NIM) and liquidity. These support the findings of Dang (2021), Nishanthini and Meerajancy (2015) and Le and Phan (2017). As interest rates rise, wealth holders are generally attracted to hold greater fractions of their wealth in bonds and reduce their holdings of cash, according to

Tobin (1956) liquidity preference theory. Hence, the results of Liquidity and Performance are Contradictory. The research reveals a general inverse link between bank performance with liquidity. This result was also supported by (Marozva, 2015; Marozva, 2017; Khoza, 2020; Dahiyat et al., 2021, Tan, 2017 & Charmier et al., 2018). During the COVID-19 pandemic crisis, the Reserve Bank reduced the regulatory requirement for the LCR from 100% to 80%. This adjustment was made to allow banks to continue lending despite anticipated liquidity difficulties and an increase in defaults. The LCR goal was to increase banks' short-term liquidity risk profile resilience (SARB, 2021). Hence South African banks remained profitable although bank profit was lower than the COVID-19 pre-pandemic crisis.

6.3.2 IMPLICATIONS OF LEVERAGE AND BANK PERFORMANCE

A study was conducted to investigate how leverage relates to bank performance. The regression study results were inconclusive since GMM leverage exhibited both a negative and a positive connection with bank performance. There was a direct correlation between bank performance (ROA and NIM) with leverage (TDR, LTDR and STDR) except when utilising NIM and TDR, ROE and leverage (TDR, LTDR and STDR), Finally, the results for Z-score and LTDR were negative.

The outcomes of a negative and significant connection were similar to those of Ahmad, Salman and Shamsi (2015), Andersson and Minnema (2018); Mburu (2015); Ali et al., (2021), Munangi and Sibindi (2020) and, also in line with Myers and Majluf (1984) solvency hypothesis that proposes a negative association between leverage and performance.

On the other hand, leverage and financial performance of banks were proven to be positively correlated and statically noteworthy according to the GMM estimation results analysis. This was consistent with Nguyen and Nguyen's (2020), Alshatti's (2015), and Al-Omari's (2020) Marozva and Magwedere's (2017; 2021) studies. According to Modigliani and Miller's (1963) theory, leverage and profitability have a positive connection.

In the pecking order theory, according to Myers and Majluf (1984), opposing correlations are predicted; more profitable enterprises will have lower leverage, demonstrating a negative link between leverage and profitability. In theory, more profitable firms should have higher levels of leverage, according to Modigliani and Miller (1963), meaning that there should be a positive relationship between leverage and profitability. As a result of high financial leverage, the firm gains valuable tax shields that increase its value.

Debit and credit control were made available to South African banks. For company and private debtors experiencing financial strain, payment holidays and debt relief were provided. Restrictions were placed on the asset seizures of commercial debtors and debtors who were experiencing financial hardship (Chothia, 2020). The SARB implemented a leverage ratio in the Banks' Regulations under the Basel III framework to act as a backstop to the risk-based capital requirement and to prevent the accumulation of excessive leverage in the financial system (SARB, 2021).

6.3.3 IMPLICATIONS OF BANK-SPECIFIC VARIABLES AND BANK PERFORMANCE

When NPL was compared to NIM, ROA, and ROE, there was a positive correlation. However, when NPL was tested using Z-score, the results were negative. This finding contradicts the findings of Charmier et al., (2018), Luvuno (2018) and Le and Phan (2017), who discovered a weak association connecting NPLs and bank execution. According to Luvuno (2018) and Le and Phan (2017), banks with larger NPLs have a lesser ability to give loans to consumers, which harms performance. The outcomes of this examination confirm that a decrease for NPL positively hinders bank profitability when measured using the total risk Z-score, although the results were positive when performance was measured using NIM, ROA, and ROE. This could be due to the payment holiday that was introduced during the COVID-19 pandemic crisis.

There is an adverse relationship between size, CAR, and ROE. This supports Taranhike (2017) and Yusuf and Ekundayo (2018) results in terms of performance – Lower capitalized banks are likely to take greater hazard and outperform those with higher capital. Additionally, smaller banks prioritise profit, while larger institutions prioritise other

objectives.

The relationship between interest rates and performance is positive. Similarly, Kana (2017) and Charmier et al., (2018) discovered positive relationships between interest rates and bank performance. Klomp and De Haan (2015) predicted that actual interest rate will be positively related to performance predicated mostly on lend-long borrowing short-term assumption. Bank margins are reduced when interest rates are low, resulting in lower profitability (Olds & Steenkamp, 2021)

6.4 LIMITATIONS AND AREAS FOR FURTHER RESEARCH

1. There is limited research on the impact of bank liquidity in South Africa, Therefore, the research uses international theoretical and empirical studies as a referential line.
2. The study primarily examined South African-registered banks. Considering that foreign banks have access to cash offered from the holding companies, it would have been useful to include in the research banks registered in South Africa as well as abroad.
3. This study covered the COVID-19 pandemic crisis from 2019 to 2022. Future research could be divided between periods during and after the COVID-19 pandemic crisis in terms of bank performance to better understand the liquidity dynamics and leverage dynamics.
4. Future studies should focus on how the interest rate, CAR and NPL have an impact on bank performance after the pandemic crisis.

6.5 CONCLUSION

The chapter included an empirical investigation of the variables that were anticipated to impact the profitability of South African banks. The descriptive statistics and correlation matrix of the study variables were obtained and discussed. This study investigated the effects of liquidity and solvency on South African bank performance between 2012 and 2022. An analysis of the relationship between dependent and independent variables was conducted using the system GMM model.

The SARB (2021), South Africa's central bank, is primarily in charge of bank supervision. Banking regulations in South Africa require all banks, controlling corporations, and foreign institution branches to disclose their capital adequacy and leverage ratios quarterly following the BCBS standard. On the other hand, according to Gagné (2022), the SARB requires banks to keep liquid assets in South Africa worth at least 20% of their specified liabilities. Furthermore, unless the PA has allowed an exemption, a bank cannot pledge or otherwise encumber any assets held in compliance with this liquidity requirement.

The overall results of this study indicate that liquid funds versus institutions performance was negatively connected. (ROE, ROA, and Z-score) exhibited a negative association with liquidity (LCR and NSFR), although NIM had a positive relationship with liquidity. Basel III regulatory changes impact banks' incentives to decide between holding liquid assets and extending credit.

There were two contradictory findings on leverage results, with positive and negative associations depending on the bank performance measure. TDR, LTDR and STDR had a positive correlation with ROA, while results were negative when NIM was correlated with TDR and positively related to LTDR and STDR. Additional ROE was negatively connected to TDR, LTDR and STDR. Finally, when LTDR was tested using Z-score, the findings were negative.

Liquidity and leverage were discovered to have varying effects on bank performance, with liquidity having a negative impact. Leverage, on the other hand, had an impact on bank profitability in both positive and negative ways. Leverage harms a bank's profitability overall.

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APPENDICEX B – PROOF OF LANGUAGE EDITING

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DECLARATION OF PROFESSIONAL EDIT

THE EFFECTS OF LIQUIDITY AND SOLVENCY ON SOUTH AFRICAN BANK PERFORMANCE

By

NOKUPHIWA LORRAINE KUMALO

I declare that I have edited this research project. My involvement was restricted to language usage and spelling, completeness and consistency, reference style, and formatting of headings, captions and tables of contents. I did no structural rewriting of the content and did not influence the academic content in any way.



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APPENDICEX C – ETHICS CLEARANCE CERTIFICATE

UNISA DEPARTMENT OF FINANCE, RISK MANAGEMENT AND BANKING ETHICS REVIEW COMMITTEE

Date: 22 APRIL 2022

Dear Ms NL Kumalo

ERC Ref #2022/CEMS/FRMB/009
Name : Ms NL Kumalo
Student #: 50026429
Staff #:

Decision: Ethics Approval from 22 April 2022 to 31 March 2025

Researcher(s): Name Ms NL Kumalo

E-mail address 50026429@mylife.unisa.ac.za, telephone 0783048300

Supervisor: Name: Prof G Marozva

Email address: marozg@unisa.ac.za, telephone 012 429 4977

Working title of research:

The effects of liquidity and solvency on South African bank performance

Qualification: Mcom Business Management (Finance)

Thank you for the application for research ethics clearance by the Unisa DFRB Ethics Review Committee for the above-mentioned research. Ethics approval is granted for the period 22 April 2022 to 31 March 2025

The negligible risk application was reviewed by the DFRB Ethics Review Committee 22 April 2022 in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment

The proposed research may now commence with the provisions that:



1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the DFRB Committee.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing, accompanied by a progress report.
5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
7. No fieldwork activities may continue after the expiry date (2025). Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

The reference number 2022/CEMS/FRMB/009 should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.

Yours sincerely,



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