ISTANBUL TİCARET UNIVERSITY
GRADUATE SCHOOL OF FINANCE
MASTERS OF INTERNATIONAL FINANCE

THE IMPACT OF NON-PERFORMING LOANS ON THE PROFITABILITY OF BANKS IN MALAYSIA AND SOUTH AFRICA

Master's Thesis

Fatoumatta FAAL

ISTANBUL, 2023

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Dedication

I dedicate all the required information in this title 'The Impact of Non-performing Loans on the Profitability of Banks' in Malaysia and South Africa' has been written in accordance with academic manners and ethical commitment. I would clarify that all the materials, sources, data, and all extra inputs have benefited well throughout the writing procedure of this thesis. All matters contained in this thesis are my personal opinion and do not reflect the official view of Istanbul Ticaret University.

Fatoumatta Faal

Istanbul 2023

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Abstract

Issues about non-performing loans and banks' profitability have continued to attract the interest of researchers and practitioners as banks are disadvantaged in covering bad debts. Moreover, banks' default credit risk mitigation strategies in various countries have been observed to have a different pattern. Thus, by conducting a comparative analysis, the study was conducted to examine the effect of non-performing loans on banks in emerging economies, South Africa and Malaysia. To achieve the study's objective, the study utilized secondary data from the Thompson Reuters database, the world bank database, and the selected banks' annual reports from 2008 to 2020. Profitability measured by Return on asset is used as the dependent variable and nonperforming loans measured by nonperforming loans ratio is used as the independent variable. To improve the accuracy and reliability of the test capital adequacy ratio, bank size and GDP are used as the control variables. More so, by employing multiple regression techniques, the findings of the study indicate that bank size and non-performing loans are found to exert positive and significant effects on South African banks' ROA metrics. As with Malaysia, a negative relationship was found between non-performing loans, capital adequacy ratio, gross domestic product, and banks' return on asset ratios, while the results of panel data analysis show that capital adequacy ratio has a positive and significant relationship with profitability and bank size also has a negative and significant effect on profitability. The findings of the study suggest that regulators should create legislation and surveillance mechanisms that will alert regulators to prospective bank failures due to the accumulation of bad debt.

Keywords: *Non-performing loans, Profitability (ROA), Capital adequacy ratio (CAR), Malaysia, South Africa*

Özet

Bankalar sorunlu alacakları kapatmada dezavantajlı durumda olduklarından, sorunlu krediler ve banka kârlılığıyla ilgili konular araştırmacıların ve uygulayıcıların ilgisini çekmeye devam etmektedir. Ayrıca, farklı ülkelerdeki bankaların uyguladıkları temerrüde ilişkin kredi riski azaltım stratejilerinin değişik bir yapıya sahip olduğu gözlemlenmiştir. Ayrıca, farklı ülkelerdeki bankaların uyguladıkları temerrüde ilişkin kredi riski azaltım stratejilerinin farklı bir yapıya sahip olduğu gözlemlenmiştir. Bu nedenle, takipteki kredilerin gelişen piyasalar, Güney Afrika ve Malezya'daki bankalar üzerindeki etkisini incelemek için karşılaştırmalı bir analiz yapılmıştır. Çalışmanın amacına ulaşmak için Thompson Reuters veri tabanından, Dünya Bankası veri tabanından ve seçilen bankaların 2008'den 2020'ye kadar olan yıllık raporlarından ikincil veriler kullanılmıştır. Bağımlı değişken, varlık performansıyla ölçülen karlılık ve bağımsız değişken olan temerrüt oranıydı. Banka büyüklüğü ve GSYİH, test sermaye yeterliliği oranının doğruluğunu ve güvenilirliğini artırmak için kontrol değişkenleri olarak kullanılır. Çoklu regresyon teknikleri kullanılarak yapılan çalışmanın sonuçları, banka büyüklüğünün ve takipteki kredilerin Güney Afrika bankaları için ROA metrikleri üzerinde pozitif ölçüde olumlu etkilere sahip olduğunu gösteriyor. Malezya'da olduğu gibi, takipteki krediler, sermaye yeterlilik oranı, bankaların gayri safi yurtiçi hasılası ve aktif getirileri arasında negatif bir ilişki varken, panel veri analizi sonuçları sermaye yeterlilik oranı ile bankaların aktif getiri oranları arasında pozitif ve anlamlı bir ilişki olduğunu gösteriyor. Karlılık ve bankanın büyüklüğü de karlılık üzerinde negatif ve anlamlı bir etkiye sahiptir. Çalışmanın sonuçları, düzenleyicilerin, kötü borçların birikmesinden kaynaklanan olası banka iflaslarına karşı düzenleyicileri uyarmak için yasalar ve gözetim mekanizmaları uygulaması gerektiğini göstermiştir.

Anahtar Kelimeler: *Takipteki krediler, Kârlılık (ROA), Sermaye yeterlilik oranı (SYR), Malezya, Güney Afrika*

TABLE OF CONTENTS

Dedication ii
Acknowledgment iv
Abstract v
Özet vi
LIST OF TABLES ix
LIST OF FIGURES x
LIST OF ABBREVIATIONS xi
INTRODUCTION 1
1. IMPORTANCE OF NON-PERFORMING LOANS IN THE BANKING SYSTEM 5
1.1. Profitability in Banking 6
1.2. Global Banking System 7
1.2.1. American Banking Crisis in the presence of non-performing loans 9
1.2.2. European Banking Crisis in the presence of non-performing loans 11
1.2.3. Asian Banking Crisis in the presence of non-performing loans 12
1.2.4. Banking in Malaysia 13
1.2.5. Banking in South Africa 14
2. THEORETICAL BACKGROUND AND LITERATURE REVIEW 17
2.1. Theoretical Framework 17
2.2. Nonperforming Loans and Profitability 20
2.3. Capital Adequacy Ratio and Profitability 27
2.4. Bank Size and Profitability 30
2.5. Gross Domestic Product (GDP) and Profitability 34
3. DATA AND METHODOLOGY 39
3.1. Data 39
3.2. Measurement of Variables 40
3.2.1. Dependent Variable 40
3.2.2. Independent Variable 40
3.2.3. Control Variables 40
3.3. Hypotheses 41
3.4. Test for Significance 41

3.5. Test for Cross-Sectional Dependency 41
3.6. Hausman Tests 42
3.7. Panel Data 42
3.8. Fixed Effect (FE) 43
3.9. Techniques of Estimation 43
3.10. Model Specification 44
4. EMPIRICAL FINDINGS 46
4.1. Descriptive Analysis 46
4.1.2. Returns on Assets versus Non-performing Loans 46
4.2. The Panel Regression 50
4.3. Correlational Analysis 52
4.4. Breusch-Pagan Test for Heteroskedasticity 53
4.5. Hausman test results 49
4.6. Regression Analysis 53
CONCLUSION 57
REFERENCE 60
APPENDICES 73

LIST OF TABLES

PAGE

Table 1: Summary Statistics of South African Bank……...45

Table 2: Summary Statistic of Malaysian Banks…….45

Table 3: VIF TEST for multicollinearity South Africa……...46

Table 4: VIF TEST for multicollinearity Malaysia……....46

Table 5: Durbin-Watson Test for Autocorrelation……...46

Table 6: Two Sample T-tests of returns on assets……47

Table 7: Two sample T-tests of nonperforming loans…….....47

Table 8: Correlation table South Africa ……48

Table 9: Correlation table Malaysia…..……...48

Table 10: Correlation Matrix of Residuals…….....49

Table 11: Regression results……50

Table 12: Panel Regression…….....52

LIST OF FIGURES

PAGE

Figure 1: Share of bank assets in the world's financial assets and financial depth of the world economy by indicators of global bank assets in 2003–2018……9

Figure 2. Non-performing loans in US commercial banking industry 1984–2013……...10

Figure 3: Returns on Assets versus Non-Performing Loans……..…44

LIST OF ABBREVIATIONS

ABSA: Amalgamated Banks of South Africa

BAFIA: Banking and Financial Institution act

BIMB: Banking Islam Malaysia Berhad

CAR: Capital Adequacy Ratio

CET1: Common Equity Tier one

CEE: Central and Eastern Europe

CBN: Central Bank Nigeria

CA: Capital Adequacy

CIA: Conditional Independent Assumption

DMBs: Deposit Money Banks

DAR: Deposit to Assets Ratio

EAFC: East Asian Financial Crisis

EU: European Union

FSMP: Financial Sector Master Plan

FNB: First National Bank

GDP: Gross Domestic Product

GMM: Generalized Method of Moments

GFC: Global Financial Crisis

IDX: Indonesia Stock Exchange

JSE: Johannesburg Stock Exchange

LLP: Loan Loss Provision

LA: Loans and Advances

LAR: Loan to Assets Ratio

MPT: Modern Portfolio Theory

MM: Modigliani and Miller

MBA: Master in Business Administration

MCB: Muslim Commercial Bank Limited

NPL: Non-performing Loans

NPA: Non-performing Assets

NIM: Net Interest Margin

NDIC: Nigeria Deposit Insurance Corporation

OLS: Ordinary Least Square

OJIK: Otoristas Jasa Keuangan (financial service authority Indonesia)

PBT: Profit Before Tax

PAT: Profit After Tax

ROA: Return on Asset

ROE: Return on Equity

ROC: Return on Capital

RMB: Rant Merchant Bank

ROTA: Return on Total Assets

SAARC: South Asian Association for Regional Cooperation

SPSS: Statistical Package for the Social Sciences

SSA: Sub-Saharan Africa

USD: United States Dollar

US: United States

INTRODUCTION

Economic growth is based on several elements, one of which is financial system stability. Banking firms dominate the financial industry in Malaysia and South Africa, as they do in most emerging countries. Hence a country's development and financial stability are dependent on the financial soundness of its banking sector, central banks must ensure that banks are in good financial standing. When a bank fails, the entire financial system of a country is jeopardized, and financial intermediation is interrupted (Malimi, 2017). Therefore, it's critical to foresee financial difficulties and take preventative actions ahead of time to mitigate the expected negative consequences on firms' financial health. However, banks face numerous risks as a result of the nature of their operation, including credit and liquidity risks, to name a few. These dangers could lead to bank collapses, which would harm businesses, depositors, and the whole economy. Since the 1997 economic slump, which wreaked havoc on many nations, notably Malaysia and South Africa, economists have been debating the concept of non-performing loans (NPLs). Although the procedure of disbursing loans by financial institutions such as banks is simple, the recovery of this sum may be more difficult. Banks want to provide as many loans as possible to demonstrate that they have a large number of borrowers, regardless of the quality of the clients, Similarly, if there is no chance of recovering their bad loans, the bank's productivity will be jeopardized, and they will not be able to obtain the loan repaid in full (Alshebmi et al., 2020), (Hamid et al., 2017). NPL is important since it reflects the credit quality of a commercial bank's loan portfolio. According to World Bank data, Malaysia's NPL to total gross loans ratio declined from 9.39 percent in 2005 to 1.55 percent in 2017 (Ramli & Nuruddin, 2020). The quality of loan assets has deteriorated over time, particularly since the global financial crisis of 2008–2009, and NPL in the portfolios of several banks, including small banks in South Africa, has not been looking good (IBID).

Despite declines in NPL rates, NPLs continue to be the primary source of risk for Malaysian and South African banks. The rise in gross non-performing loans poses a significant danger to banks, the financial industry, and the economy. Furthermore, failure to handle non-performing loans over time has a long-term impact on bank profitability. An

increase in NPLs will have an impact on a bank's profitability and liquidity, which are the two most important factors in determining a bank's efficiency.

Nevertheless, some the recent studies on Nonperforming loans and profitability includes Efficiency measurement of the banking sector in the presence of nonperforming loan (Hamid et al., 2017), the place of nonperforming loans in the Turkish banking sector (Yurttadur et al., 2019), the effect of nonperforming loan on profitability in the banking sector in Indonesia (Martiningtiyas & Nitinegeri, 2020), problem loan and cost efficiency in commercial banks (Berger & DeYoung, 1997), the effect of nonperforming loan on the profitability of commercial banks case study of Vietnam (Do et al., 2020), the effect of nonperforming loan on the profitability of a commercial bank in Kenya (Kirui, 2014), etc. Despite this wide range of literature on the topic there still exists a gap in the literature investigating the impact of a nonperforming loan on the profitability of a bank; in the comparative study of Malaysia and South Africa. Also, the application of the study to the context of emerging economies is still lacking. So, this study filled that gap by adding to the literature by using a comparison of two countries from emerging economies. Against this background, the study investigates the effect of a nonperforming loan on a bank's profitability, in Malaysia and South Africa. Hence the study employs multiple regression techniques in the estimation of the proposed model. In addition, the study uses secondary data from the Thomson Reuters database between the years 2008 to 2020.

The paper is divided into three chapters, we have the introduction of the subject, objectives, problem statement, importance of the study, and limitations. Chapter one, theoretical review and empirical review of previous studies on the effect of non-performing loans on profitability. Also, under the chapter, we will deal with Nonperforming loans and Profitability, Capital adequacy ratio and Profitability, Bank size and Profitability, and GDP and Profitability as subtitles. Further, chapter two methodology and approaches used for the study, measurement of the variables, data analysis, and interpretation of the data. Chapter three analysis and discusses the findings. Finally, the conclusion, possible recommendations, and suggestions for future studies.

Problem Statement

The increase in non-performing loans necessitates the addition of provisions for loan and advance losses, lowering overall earnings and weakening the structure. For decades, professionals and financial specialists in various nations have debated the concerns and problems surrounding bank NPLs. The problem of nonperforming loans affects not only individual banks but the whole banking industry as well as macroeconomic variables. In truth, a high proportion or level of NPLs in banks is nothing more than a reflection of the banking structure's condition of mismanagement. Thus, “the increase in the level of gross non-performing loans poses a significant risk to banks, the financial sector, and the overall economy” (Alshebmi et al., 2020). Banks are expected to contribute to the development and growth of the banking system and economy, therefore "a high level of nonperforming loans (NPLs) could undermine the banking industry’s and the financial system’s overall stability"(Boudriga et al., 2010). A careful selection of the proposed clients should be made when lending because "adverse selection" causes "high-quality borrowers to be supplanted by low-quality borrowers, resulting in a decline in the overall quality of the bank loan portfolio and the accumulation of non-performing loans in the long run," decrease in profitability, and erosion of capital."(Marcello Bofondi and Tiziano Ropele, 2011). However, little is known about nonperforming loans and their impact on profitability in Malaysia and South Africa. The study to be conducted will aim at shedding some light on the impact of the nonperforming loan on banks’ profitability in Malaysia and South Africa.

Objective

The main objective of this paper is to examine the impact of non-performing loans on the profitability of banks in Malaysia and South Africa.

Limitations

The scope of the study was limited to secondary data obtained from the Thompson Reuters database and reported financial statements of banks in Malaysia and South Africa for 13 years. The researcher does not have the means to travel to the countries involved to gain primary data. The data for the period under the study was also challenging because some

financial ratios were not available and had to be computed, which consumed a lot of time. Nonetheless, one of the drawbacks of the study was the lack of categorizing non-performing loans based on their type by considering banks' size and growth rate.

Importance of the Study

Creditors will be able to evaluate the creditworthiness of Banks based on reports of both financial and operational losses, but not neglecting the latter because it has an equal impact on profitability.

The study will help investors understand that the whole amount of non-performing loans has an equivalent impact on their return on investment and will encourage them to consider NPLs when making investment decisions. The managers of banks understand the need of keeping an eye on and reining in non-performing loans because they have an equivalent impact on profitability through provisions made by banks. The study will also be important to commercial bank managers as they will know the effect of non-performing loans on commercial banks and know the necessary measures to take in preventing them. The study's findings will also help the staff understand how important it is to limit operational losses because doing so will have an impact on the bank's profitability and future benefits. Furthermore, with the help of this study, management consultants can offer recommendations for the best investments based on both the financial losses situation and the underlying non-performing loans, which have an impact on the profitability of banks.

Financial Consultants will be able to grasp the sensitivity of return on assets to nonperforming loans ratio and nonperforming loans coverage ratio as a result of the study and will be able to provide financial advice to commercial banks and other stakeholders. Academicians will be able to identify areas that need more research because it will add to existing knowledge. The study will also shed light on how different banking industry stakeholders are impacted by operational losses. Therefore, this study will be helpful to academics tasked with disseminating knowledge to various stakeholders.

1. IMPORTANCE OF NON-PERFORMING LOANS IN THE BANKING SYSTEM

Non-Performing Loans (NPLs) also called Non-Performing Assets (NPAs) is a credit facility for which the interest and/or principal amount has been past due for a specified period and is referred to as a nonperforming loan or asset. A loan is an asset for a bank since it generates cash flows through interest and principal repayment. A bank's profits are derived from interest payments. If assets are not maintained for a while, Banks typically treat assets as non-performing. When a debtor fails to pay the principal or interest for 90 days or more, the account becomes non-performing (Ramli & Nuruddin, 2020). A high percentage of non-performing assets in comparison to other lenders could be a red flag. Kirui (2014) claimed that a country's level of non-performing assets (NPAs) is the strongest gauge for the health of its banking sector. Bank performance is reflected in nonperforming loans. Improved asset quality of both public and private sector banks is shown by a decline in the ratio of non-performing loans. On the other hand, commercial banks should be concerned about the rise in the ratio of nonperforming loans to total loans. The decrease in the ratio of gross non-performing assets to gross loans shows that the credit portfolios of both sector banks have improved. The bank's return on assets and liquidity risk management are directly impacted by the ratio of gross non-performing assets to total assets. Through a loss of interest income and a write-off of the principal loan amount, non-performing assets are endangering stability and destroy bank profitability.

Non-performing loans that degrade asset quality also have a detrimental impact on costs and productivity. While linked adverse effects make it difficult to generate fresh resources and make new loans, an excessive amount of resources being used to collect non-performing loans has a detrimental impact on the profit-productivity balance (Yurttadur et al., 2019). One of the primary causes of the issues with economic stagnation is the NPL. Every impaired loan in the financial sector raises the likelihood of trouble and unprofitability for the company. Thus, NPL is likely to hamper economic growth and reduce economic efficiency (Messai & Jouini, 2013).

Non-performing Loans Ratio and Non-Performing Loans Coverage Ratio are two frequently used metrics for non-performing loans/assets. The ratio of allowance for

probable losses on non-performing loans to the total amount of non-performing loans is known as the non-performing coverage ratio and is calculated as follows: Provisions for Losses on Non-Performing Loans over Non-Performing Loans. The non-performing loan (NPL) ratio is the proportion of NPLs to all loans (gross of allowance for probable losses). The ratio of non-performing loans to all loans and advances is used to calculate it. This study uses a non-performing loans ratio, which compares non-performing loans to all other loans and advances.

1.1. Profitability in Banking

For many years, the prime priority for banking operations was thought to be profitability. A vast body of research examines how crucial resource management is in determining profitability because it has attracted substantial attention from specialists even in recent years. The difference between total revenues and total costs over an extended period could be referred to as profit. Here, the income must be a direct result of the expenses, and the income must occur during the same period as the expenses according to the Matching Concept. The time frame could be one week, one year, three months, etc. (Kirui, 2014). Whether or not cash was used to pay for the expenses is not irrelevant. Neither is it necessary that the income be received in cash. Profit is the lifeblood of business for an organization focused on making a profit. Profitability is measured using a variety of metrics, including Return on Assets, Return on Equity, and Net Interest Margin. Researchers' opinions on which metric is better than the others as a reliable indication of profitability vary. Trujillo-Ponce (2013) uses both ROA and ROE as a proxy for profitability in his study. Only ROA was used by (Kirui, 2014)(Do et al., 2020)(Funso, Ayeni, Kolade, Oke, 2012) as a measurement for profitability. Aladwan (2015) used ROE as a proxy for profitability in his study. ROE, ROA, and NIM were used as a measurement of profitability by (Rohman et al., 2022). A business continues to exist because it anticipates making money. If that is determined to be unachievable. The best course of action is to shut down or leave the business. According to (Kirui, 2014) Profitability measures, including Profit Before Tax (PBT), Profit After Tax (PAT), ROE, Rate of Return on Capital (ROC), and ROA. ROA as a measure of profitability is preferred and considered

the most appropriate metric for this study. Return on Assets has been measured as; Return on Assets (ROA) = Net Earnings/Total Assets.

1.2. Global Banking System

The global financial system and its related mechanism for redistributing financial resources within the world economy are inextricably linked to the world banking system, with banks serving as the primary financial intermediaries. The modern global banking system consists of transnational and multinational banks, national banking systems, and international and regional financial institutions, and is a complex multilevel organization with its hierarchical structure. Alongside it, the design of the global financial system matches the spatial organization of the global economy, whose top taxonomic levels correspond to the key categories of regions. As organic components of the global banking system, national and international banking sectors have changed in recent years as a result of exogenous factors like the global financial crisis, changes in the market environment following the crisis, and modifications to the institutional and regulatory framework. Over half of all financial assets in the globe at the beginning of the 20th century was held in banks. The proportion of bank assets in the structure of global financial assets changes along with it, and the overall role of the banking sector as a component of the financial infrastructure also changes as a result of changes in the preferred sources of financing for economies, rising interest in financing through stock market instruments, and corresponding changes in the global financial market. Between 2003 and 2007, the percentage of assets held by banks ranged between 34 and 40%, reaching 47% at the start of the global financial crisis (Fig. 1).

During the crisis years of 2008–2009, many international banks sold some of their foreign assets to compensate for losses. The share of bank assets also declined, from 47% in 2008 to 42% in 2010, as a result of the simultaneous collapse of credit operations in both the domestic and euro markets. The expansion of the bank assets shares in total financial assets up to 51% in 2018 reflects the gradual recovery of the global banking sector since 2011. Bank assets are being redistributed between various social and economic categories of

nations at the same time. While the share of emerging nations' bank assets increased from 16.0% to 29.6% over the same period, the share of developed countries' bank assets declined from 84.0% in 2003 to 70.4% in 2017. In terms of bank assets, the financial depth of the world economy is expanding over time. The ratio of bank assets to world GDP, which is used to compute the financialization index of the world economy, rose in the run-up to the financial crisis, reaching 174.6% in 2007 from 131.7% in 2003 and 153.7% in 2006 (see Fig. 1). This statistic, which in the years between 2011 and 2013 ranged between 162 and 169%, shows a little decline in the early post-crisis years.

However, since 2014, there has been a rise in banks' financialization, which peaked in 2017 (281.7%) at its highest level. Such a situation can be read in one of two ways. On the one hand, the expansion of bank assets denotes an increase in the financing of the global economy. However, given that bank assets are currently twice as large as the global GDP, a rise in banking financialization entails a widening of the gap between the size of the real economy and the scope of banking operations, which could set off the next phase of the financial crisis.

Since the financial crisis a decade ago, the international banking sector and regulatory bodies have been working together to re-establish the financial stability and security of the global banking system. returning the banking system to the financial stability and security frameworks. The average global ratio of Tier 1 capital to total risk-weighted assets, which is a crucial Basel III indicator of a bank's financial stability, rose from 9.8% in 2007 to 31.2% in 2017. Since 2012, banks' average ROE has ranged between 8 and 9% (Dietz et al., 2018). The 124 USD trillion in assets held by the top 1000 banks worldwide in 2018 as well as a ROA of 0.9% on average (Deloitte center for financial services, 2019). In 2018, the 1,000 largest banks' combined profit climbed by 15.6% over the prior year to reach 1.1 trillion USD, which is over ten times greater than the crisis year of 2009. At the same time, many nations and areas of the world had varied post-crisis recovery and adaptation procedures to the new regulatory policy requirements. The global crisis has accelerated those regional shifts in the design of the global banking system that had been foreseen even before the crisis, leading to changes in the allocation of bank assets and bank profits among

global regions, the rankings of the biggest banks in the world, the rates of return on assets and return on equity of banks from different regions, and the regional specificities of mergers and acquisitions in the banking industry.

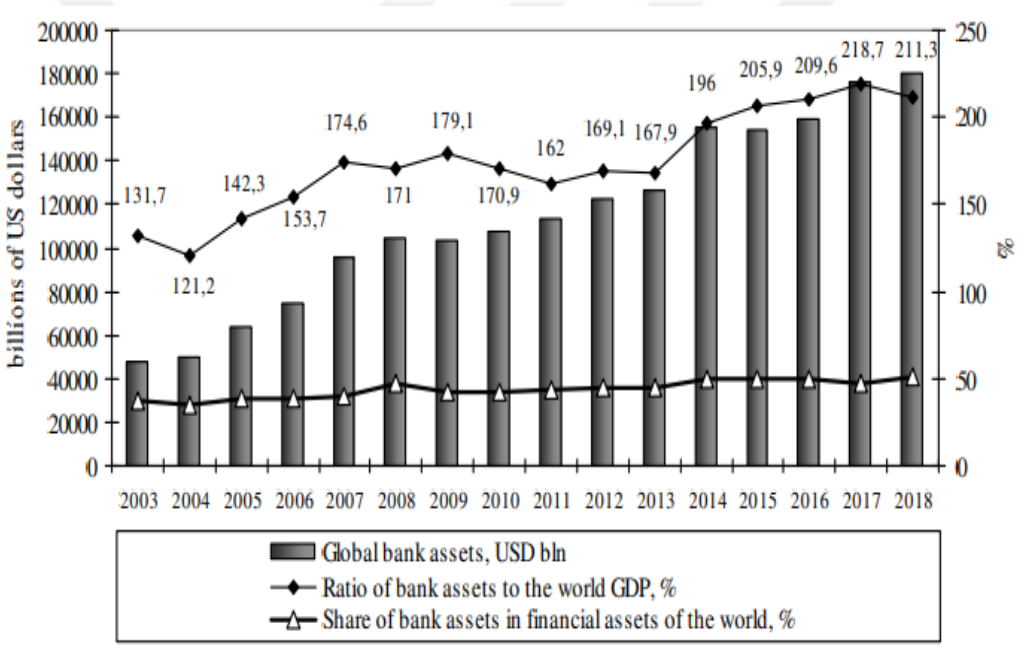


Figure 1. Share of bank assets in the world's financial assets and financial depth of the world economy by indicators of global bank assets in 2003–2018

Note. Authors' calculations based on sources (Bank for International Settlements Statistics; IMF, 2003–2019)

1.2.1. American Banking Crisis in the presence of non-performing loans

The recent global financial crisis (GFC) was marked by a surge in non-performing loans (NPLs) in most nations including different regions across the US. An increase in NPLs in a bank's loan portfolio indicates increased risks to the bank's liquidity and profitability (Ghosh, 2015). Excessive financing and high-interest rate are regarded main reasons for the high rate of NPLs in the US banking sector. Indeed, the growth in loan defaults, home foreclosures, and NPLs throughout US states underscores the links between regional and

national macro-financial shocks and banking sector vulnerability. This deterioration of banks' asset quality is not only financially destabilizing for the banking system but may also reduce economic efficiency, impair social welfare, and declining economic activity(Ghosh, 2017).

Fig. 2 provides an ocular view of NPLs in the US commercial banking industry for the period of analysis. There is an increase in NPLs during the US banking crisis of the late 1980s to the early 1990s followed by a decline till the mid-2000s. NPLs have increased significantly more lately, up until the year 2010. Finally, NPLs in banks' balance sheets decreased over the second decade of the new century, suggesting an improvement in the asset quality of US commercial banks.

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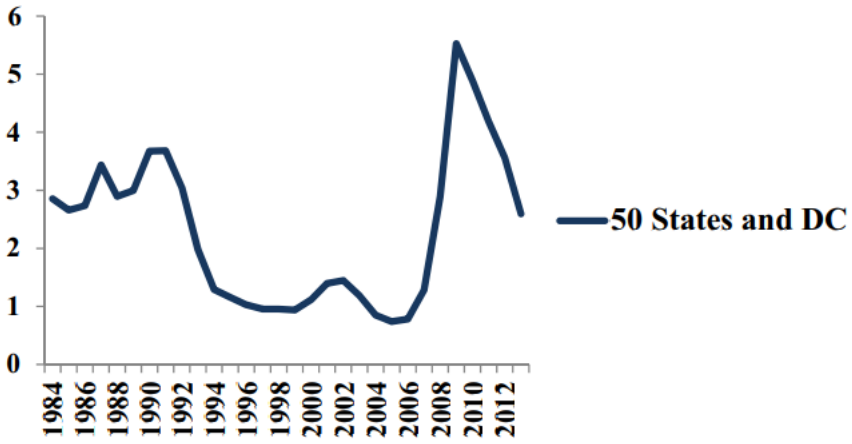


Figure 2. Non-performing loans in US commercial banking industry 1984–2013

Source: https://doi.org/10.1016/j.jfs.2015.08.004

During the US banking industry's era of volatility from 1987 and 1992. NPLs in the US commercial banking sector averaged 2.29% throughout the whole sample, but from 2007 to 2010, they were at 3.65%, which is a little higher than the average of 3.29% from 1987 to 1992(Ghosh, 2015). The impact of NPLs on many facets of the US economy also serves as an example of the vagaries of the real sector to the turbulence in the banking sector. It further emphasizes the necessity not only to reduce NPLs for the sake of banks' financial soundness but also to reduce their negative effects on the health of the US economy.

1.2.2. European Banking Crisis in the presence of non-performing loans

The banking systems of European Union (EU) nations are among the most advanced in the world. European banks have helped economies that are predominantly dependent on small and medium-sized businesses thrive, and they have gradually built connections across the integrated financial market of the EU. Yet, on the back of the apparent stability in the early years of the euro area, several banking systems become very reliant on foreign wholesale funding. In 2008, Europe was impacted by a "sudden stop" in capital flows, a phenomenon well-known to emerging market policymakers. This brought to light unsustainable private-sector debt and quickly resulted in widespread nonperforming loans (NPLs)(Lehmann, 2021). The highest shares of NPLs are detected in Latvia, the Czech Republic, Slovakia and also in Croatia, and later Poland. After the 'clean-up of the financial sector and together with economic recovery, NPLs decreased to the lowest value average of 2.58% in 2007. Following the financial crisis of 2008/2009, NPLs grew quickly throughout CEE countries, occasionally reaching very high levels comparable to those observed after past financial crises. The period of easy, foreign-financed credit abruptly came to an end when the global financial crisis hit CEE countries in the fall of 2008, and export markets collapsed, sending the region's economy into a severe recession (Szarowska, 2018). At the same time, financial institutions showed varying performance both in terms of profitability and credit quality deterioration, particularly concerning non-performing loans (NPLs) during the 2009–2011 period (Erdinç & Gurov, 2016).

NPL ratios for the region as a whole surged rapidly from less than 3% before the crisis to over 12% by the end of 2011, as problems with the quality of banks' assets quickly followed. In those nations where the economic downturn was particularly severe and where the pre-crisis credit boom had been the most intense, NPL difficulties were at their worst: NPLs exceeded 23% in Romania (in 2011), Lithuania (2010), and Latvia (nearly 20%). However, the economic recovery and recent developments have been accompanied in these nations by a decline in non-performing loans (4.6% in Latvia and 6.7% in Lithuania in 2015). In contrast, countries that avoided recession, such as Poland, or overcame it very quickly or slightly, such as Estonia or the Czech Republic, experienced a more modest rise

of NPL ratios, to peaks of 7.16% and 6.28%, respectively, 6.45%. Currently, a share of NPLs is stabilized and oscillates about 5% of total loans (only 1.68% in Estonia in 2015). The second half of 2009 saw the return of economic growth, which slowed the increase in NPL ratios and the improvement of the better-performing economies (Szarowska, 2018).

1.2.3. Asian Banking Crisis in the presence of non-performing loans

NPLs increased significantly during the Asian financial crisis in the late 1990s across East and Southeast Asia. However, attempting to prevent NPLs is nearly unachievable and would probably lead to unfavorably low levels of credit and economic activity, particularly in Asian economies, where banks are the primary sources of corporate funding. After the Asian financial crisis, NPLs in Asia reached a significant peak, and it took over ten years for them to return to pre-crisis levels(Fell et al., 2021).

The Asian financial crisis of 1997–1998 was a watershed moment for NPLs and financial sector development. After the outbreak of the crisis, Indonesia, Malaysia, the Philippines, the Republic of Korea, and Thailand all experienced a 30% decline in the aggregate GDP in just over a year. As a result, NPL ratios in Southeast Asia rose significantly, with Indonesia and Thailand experiencing NPL ratios higher than 40% in 1998 (See appendix). Due to strong post-crisis reforms, a combination of micro- and macroprudential measures, and stable macroeconomic conditions, NPL ratios in the crisis-affected economies decreased to noticeably lower levels in a decade. In most other Asian economies, NPL ratios were also under control by the late 2000s.

However, in the aftermath of the global recession of 2008, some nations, particularly in Central and South Asia, as well as Mongolia, experienced a surge in distressed assets, along with the corresponding rise in default risks and financial vulnerabilities. Due to a decline in the price of coal and other natural resources following the global recession, the NPL percentage in Mongolia reached 10.1%. Concern was raised about a rise in these economies' NPL ratios since high NPL levels can damage banking institutions and slow down economic progress.

1.2.4. Banking in Malaysia

The most crucial element of Malaysia's financial system is its banking system. It aids in expanding the financial sector, stabilizing the economy, and creating and executing monetary and credit policies to achieve financial and economic objectives. Before the East Asian Financial Crisis (EAFC), the Malaysian banking sector consisted of commercial banks, finance companies, and merchant banks that were licensed and controlled by Bank Negara Malaysia under the Banking and Financial Institutions Act 1989 (BAFIA). The Islamic banks were also licensed under the Islamic Banking Act of 1983. Malaysia now has only three types of financial institutions: traditional commercial banks, Islamic banks, and investment banks. Following the 1997 EAFC, the financial environment, notably the structure of the Malaysian banking industry, was altered by the execution of a merger program. For example, the Malaysian banking system has only 54 institutions in 2016, compared to 88 in 1997. Changes in the number of institutions may alter the banking industry's market structure, especially in terms of concentration and competition.

Furthermore, the Malaysian banking competition research is more appealing because Malaysia is the first country to create a dual banking system, in which the Islamic banking system coexists with the regular banking system. Furthermore, changes in regulation governing the nature and scope of operations of Islamic banks, particularly following the Financial Sector Master Plan (FSMP 2001), have altered the Malaysian banking scene. The shift in banking operations from Islamic subsidiaries (1997-2004) to full-fledged Islamic banks (2005-2016) has allowed banks to compete with one another for market share. Malaysia's Islamic banking system has progressed through three stages. The first phase lasted from 1983 to 1992, followed by the second phase from 1993 to 2003, and the third phase from 2003 to now (2022 onwards). The Islamic banking system had a monopoly structure in the initial phase, with the market monopolized by the sole Islamic bank that existed at the time, namely Bank Islam Malaysia Berhad (BIMB).

With the expanding number of Islamic banks operating in this market, the Islamic banking market structure has evolved over the second and third phases of development. The number of Islamic banking institutions increased from two in 1997 to sixteen in 2016. The growth

in the number of banks, from an industrial-organizational standpoint, indicates a higher level of market rivalry.

1.2.5. Banking in South Africa

South Africa has a well-established banking regulatory framework. The banking capital requirements in the Banks Act, 1990 (Banks Act) and its subordinate legislation, together with the exchange control regulation enforced in South Africa by the national treasury, meant that South African banks were largely shielded from the 2008 global financial crises. The Financial Sector Regulation Act, 2017 (FSR Act) was signed into law on 21 August 2017, giving effect to the implementation of the "Twin Peaks" model of regulation in the South African financial sector. The Minister of Finance (MoF) determined that the FSR Act (with the exception of a few transitional periods) would commence on 1 April 2018. As a result of the commencement of the FSR Act, and in particular of section 290 of the FSR Act, the Banks Act has been amended to replace references to the Registrar of Banks at the Bank Supervision Department of the South African Reserve Bank (SARB) with the newly established Prudential Authority (PA). Accordingly, the PA is responsible for supervising the operation of banks in South Africa and ensuring compliance by banks with the Banks Act. The South African banking system is well-developed and regulated. However, it has also been argued that it is characterized by high and opaque fees (Financial Regulatory Reform Steering Committee, 2013). The government responded by reviewing the regulations and prioritizing prudential and market conduct regulation to the introduction of the “Twin Peaks model” of financial regulation. The new framework is intended to promote greater competition and lower bank fees.

The SARB as the central bank of South Africa is primarily responsible for overseeing banks. The PA, as a juristic person operating within the administration of the SARB, supervises the domestic activities of all banks, representative offices and branches of foreign banks, and the foreign activities of South African banks. A key objective of the PA is to promote the soundness of the domestic banking system, through effective and efficient application of international regulatory and supervisory standards and best practice. To keep informed of international regulatory and supervisory developments, the PA participates in,

and contributes to, various international forums. The banking business in South Africa has altered dramatically since 2001, when the number of registered banks reached 41, before falling to 17 by the end of 2016 (SARB, 2016). Global uncertainty had a particularly severe impact on the South African banking industry following the September 2001 terrorist attacks in the United States (US), as several smaller banks lost their licenses or merged with larger South African universal banks (Shayanewako & Tsegaye, 2018). As a result, the South African banking industry was characterized by four dominant universal bank holding companies as of 2017, namely Barclays Africa Group Ltd (functioning under ABSA bank), FirstRand Group Ltd (which includes the banks First National Bank – FNB – Wes bank and Rand Merchant Bank – RMB), Standard Bank Group Ltd, and FirstRand Group Ltd (which includes the banks First National Bank – FNB – Wes bank and Rand Merchant Bank – RMB). Standard Bank Group Ltd and Nedbank Group Ltd are two of the most well-known financial institutions in South Africa. In 2017, the so-called Big Four had a combined market share of almost 83 percent (SARB, 2017). Investec Bank Ltd, a high-net-worth specialty bank with dual listings on the London Stock Exchange and the Johannesburg Stock Exchange (JSE), is the fifth largest by asset size.

Capitec Bank Ltd has had considerable expansion in the retail banking sector in recent years. It surpassed Nedbank in market capitalization in September 2017 and has the second-largest number of retail clients of all South African banks (Heerden & Coetzee, 2019). Even though the South African banking industry is highly concentrated, with primarily four significant banks, the industry as a whole is not very huge in global terms. The total assets-to-GDP ratio has continuously been above 100 percent in recent years, with total assets of around R4.9 trillion at the start of 2017 (SARB, 2017)(Shayanewako & Tsegaye, 2018). In terms of individual banks, the largest South African bank, the Standard Bank Group, was projected in 2014 to be almost 20 times smaller in terms of assets, 18 times smaller in terms of equity, and employing over 10 times fewer people than the largest bank in the world (van Heerden & Coetzee, 2019). Despite its tiny size in global terms, the industry as a whole is highly capitalized.

The need for transparent, sufficient, and timely loan loss provisioning became particularly important after South African banks were affected by the 2007-2009 global financial crisis

which raised concern that the level of provisions by South African banks was not commensurate with the credit risk exposure of banks which led to speculations that bank provisions may be driven by other considerations other than credit risk considerations. In 2013, the SARB amended the banking regulation to be in line with the Basel III capital framework to ensure that the banking system has sufficient capital to meet unexpected losses or shocks to the financial system in South Africa. In 2004, the SARB made some adjustments to the existing banking regulation in line with Basel II 2004 and require banks to include eligible provisions to Tier II capital. Eligible provisions include specific provisions, partial write-offs, country risk provisions, and general provisions.4 In Basel II, banks were required to set aside loan loss provisions for actual loan default, highly probable loan default, and loans that are past due for more than 90 days. However, the imprecise definition of what 'loan loss' entails is argued to create opportunities for South African bank managers to exercise their judgment about whether specific loan losses are highly probable to default or less probable to default. Such discretion is also argued to encourage under-provisioning by banks in South Africa. Unsurprisingly, the PWC report states that a significant reduction in bank loan loss provisions contributed to increasing the profitability of the biggest four banks in South Africa (PWC, 2011) raising some concern that the provisions of South African banks are not solely driven by credit risk considerations but rather by the need to smooth income to increase bank profits.

2. THEORETICAL BACKGROUND AND LITERATURE REVIEW

As observed in the extant literature, non-performing loans and banks' operational efficiency has sparked in recent years given the need for banks to execute stringent policies and rules in the issuance of loans to customers. As presented in the proceeding sections, banks operating at both national and regional levels have been significantly affected by bad debts thus, crumbling their financial performances.

2.1. Theoretical Framework

Markowitz (1952) One of the most significant and efficient economic theories relating to finance and investing is the modern portfolio theory (MPT). The advantages of diversity, also known as "not putting all your eggs in one basket," are measured by modern portfolio theory. The Modern Portfolio Theory (MPT) refers to an investment theory that allows investors to assemble an asset portfolio that maximizes expected return for a given level of risk. By incorporating the examination of risk-free assets. Tobin (1958) broadened Markowitz's (portfolio theory), allowing for the adjustment of portfolios' positions on the efficient frontier. Given predictions of future returns and a suitable covariance matrix of share returns. Tobin (1958) and Markowitz (1952) demonstrated that it was possible to determine the composition of an ideal portfolio of risky securities.

The portfolio theory approach plays a significant role in the studies of bank performance and it is the most relevant approach when it comes to studying bank performance (Atemnkeng & Nzongang, 2010). According to the Portfolio Balance Model of Asset Diversification, the optimal holding of each asset in a wealth holder's portfolio is a function of policy decisions determined by several factors, such as the vector of rates of return on all assets held in the portfolio, a vector of risks associated with the ownership of each financial asset, and the size of the portfolio. It suggests that bank management decisions are what led to portfolio diversification and the desired portfolio composition of commercial banks. Further, the ability to obtain maximum profits depends on the attainable set of assets and liabilities determined by the management and the unit costs incurred by the bank for producing each component of assets, (Atemnkeng & Nzongang, 2010).

To reduce the risk of borrowers not making their loan payments on time and creating portfolios of non-performing loans that have a negative impact on profitability, commercial banks should think about diversifying their investment portfolios. The notion of portfolio theory, which holds that people can lower firm-specific risk by diversifying their portfolios, is the foundation for the concept of revenue diversification. According to its proponents of activity diversification or product mix, states that diversification provides a stable and less volatile income, economies of scope and scale, the ability to leverage managerial efficiency across products, and in the case of commercial banks, a decrease in non-performing loans and an increase in Return on Assets, which is used as a measure of profitability

Further, interest in corporate capital structure has sparked in recent years following Modigliani and Miller's (MM) 1958 theorem on " the irrelevance theory of capital structure (Luigi & Sorin, 2009); (Ardalan, 2017); (Kouki, 2011) thus, bringing new a school of thoughts to firms' debt-equity financing decisions to which firms' capital structure functions independently to its market value (Aboura & Lépinette, 2015). However, the birth of the theorem has brought different opposing arguments by other theorists (Aboura & Lépinette, 2015) since supporters of the theory hold strong grounds for the necessity of firms to minimize their level of leverage by engaging in more equity financing. More so, the MM theorem further underlines the significance of firms financing selection decisions on the premises of debt-equity financing in the allocation of cash flows among investors (Luigi & Sorin, 2009) and also the creation of homemade leverage in firms and investors' access to financing thus, providing a cushion to offset any impact of unplanned leverage to firms' value. On the other side of the spectrum, the theory also underpins the need for firms' investment decisions to be independent of their asset and liabilities (Dotsis, 2019) with other supporters to theorem holding the notion of individual borrowings and firms' borrowing to be a perfect substitute based on firms' value and return to be independent to their debt-equity ratios (Hellwig, 1981).

Additionally, in a perfect market condition, the MM theorem assumes firms' capital cost and value to be independent of their capital structure (Al Kahtani & Al Eraij, 2018); (Cline, 2015) which implies the lack of importance of their capital structure in making financing

decisions where investment options are efficiently managed. However, viewing from the banking perspective, the theorem is observed to have some drawbacks given the variations which exist between banks' assets and liabilities components in the creation of demand deposits (Dotsis, 2019). Besides, the regulative frameworks supporting banks holding higher equity capital funding create doubts about the applicability of the MM theorem to the banking sector (Aboura & Lépinette, 2015). To add on, studies have asserted the invalidity of the MM theorem to banks given the possibility of bankruptcy and moral hazards that might arise for individual borrowers (Hellwig, 1981). Similarly, evidence has been provided by banks favoring leverage to equity financing (Aboura & Lépinette, 2015), thus, opposing the MM theorem. Further, by factoring in dividend payout policy, the findings of (Kouki, 2011) indicate a significant relationship between firms' leverage and value, hence, further providing evidence against the theory. Nonetheless, following the discussion on the validity of the MM theorem to banks' financing and their financial performances, this study argues of banks' engaging in leverage has an impact on their financial metrics given the negative impacts of NPLs and borrowers' default to banks' operational efficiency.

Furthermore, Asymmetry information theory is a well-known theory relating to the situation where erroneous knowledge develops. In particular, it is likely to arise when two or more parties have differing information over one another, When the borrower has more knowledge of his financial situation than the lender, this is one particularly striking example of asymmetric information in the financial markets. Do et al., (2020) proved that information sharing might enhance banks' knowledge of credit applicants and reduce the likelihood of unfavorable selection. According to the theory, it is difficult to distinguish between a bad and a good borrower; this may have an impact on lending practices and lead to issues with moral hazard and adverse selection. Therefore, the party with less knowledge of the precise item to be transacted is in a position to decide whether the transaction is right or wrong. Adverse selection and moral hazards have led to significant accumulation of non-performing loans in banks(Bofondi and Ropele, 2011). Managers of commercial banks may be more knowledgeable than other stakeholders about the implications of nonperforming loans on their profitability. In this scenario, they might omit non-performing

loans from their disclosures and/or use provisions for losses on non-performing loans to smooth out their profits.

2.2. Nonperforming Loans and Profitability

The issue of loan default has always been at the forefront of the risk management units' and regulatory authorities' concerns. The growing number of non-performing loan issues has the potential to harm the overall health of a banking company. It is necessary to examine NPL because it indicates the credit quality of a commercial bank's loan portfolio (Ramli & Nuruddin, 2020). Non-performing loans are any credit that is granted with the risk of capital and interest payments not being paid on time. Nonperforming loans (NPLs) are one of the main factors for economic stagnation. Each damaged loan in the financial sector increases the chance of a business going bankrupt and unprofitable (Yurttadur et al., 2019)

Non-performing loans are any credit that is granted with the risk of capital and interest payments not being paid on time. Nonperforming loans (NPLs) are one of the key reasons for economic stagnation. More so, drawing from the 2008 financial crisis, research has shown an increase the in the level of developed nations' NPLs portfolio (Thornton & Tommaso, 2021) which warrants policymakers to design and implement ramification strategies geared towards improving operational efficiencies of banks in Europe. This is further sparked by the findings of Bhowmik & Sarker, (2021) which show an increase in levels of banks in SAARC country's NPLs impeding their efficiency performances.

To add on, the financial industries raise the risk of companies becoming insolvent and unprofitable (Yurttadur et al., 2019) based on certain regulative and operational principles. However, non-performing loans are 'poor' or 'undesirable' output that is produced alongside various loans in the banking business. Because asset quality and operating performance are positively associated from the perspective of management accounting, the presence of this unwanted output such as non-performing loans in the Malaysian banking sector will harm a bank's productivity (Hamid et al., 2017).

Nonetheless, as with the studies of Chukwuogor et al., (2021), studies have attempted to examine the influencing roles of bank-specific variables including NPL and net interest

margin on banks' profitability and solvency. Others observed the reverse effects of profitability on banks' NPL during the pandemic (Apergis, 2022). Thus, as shown by the findings of Rohman et al., (2022), banks in Indonesia were found to experience a decline in profitability amid the pandemic. Besides, evidence has been provided of banks' NPL having positive and significant effects on their ROA (Madugu et al., 2020a) thus, creating the need of adopting stringent policies to remain viable. Expanding the discussion based on being a domestic or foreign bank, research has shown domestic banks have more NPLs on their financial statement compared to foreign banks due to an increase in interest margins (Afrin et al., 2022). Similarly to determine causal relationships between commercial banks' credit risk and their business performance, the findings of Twum et al., (2022) show significant but negative relationships between banks' NPLs and their ROE metrics.

Furthermore, in their research Altunbas et al.,(2000), Japanese banking efficiency and risk were evaluated. The authors applied the Tobit regression to discover that nonperforming loans had a significant impact on the level of bank inefficiency. Ramli et al., (2019) further state that, if the bank's asset quality is insufficient, the bank's bad debt losses will rise, as will the bank's non-performing loan collection costs. Poor firm management, for example, resulted in an inefficient bank, which hampered the loan-granting process. Furthermore, argue that when nonperforming loans are kept indefinitely, it influences the resources that are bound in unprofitable regions. As a result, NPLs are likely to stifle economic growth and diminish efficiency.

Lawrence et al., (2020) comparatively assess the impact of credit risk on the performance of big and small banks in South Africa. Using two panel data sets were analyzed using the R-Studio software version 3.5.1 to assess the impact of capital adequacy ratio (CAR), non-performing loan to gross loan (NPLGL), loan1to-deposit ratio (LTDR), leverage ratio (LR), board gender diversity (BGD), with bank size (total asset) and AGE as control variables, on performance, (return on asset [ROA] and return on equity [ROE]). The findings of the study revealed that non-performing loan (NPL), CAR, LR, LTDR and age of banks all have significant and greater impact on performance, as measured by ROA, of small banks when compared with big banks. Surprisingly, NPL was revealed to have a lesser impact on the

ROE of small banks as compared to the ROE of big banks but showed no impact on the ROA of big banks during the period of 2008–2017.

Munangi & Sibindi, (2020) examined the impact of credit risk on the financial performance of 18 South African banks for the period 2008 to 2018. Panel data techniques, namely the pooled ordinary least squares (pooled OLS), fixed effects and random effects estimators were employed to test the relationship between credit risk and financial performance (proxied by non-performing loans (NPLs) and by return on assets (ROA) or return on equity (ROE) respectively). The results of the study documented that credit risk was negatively related to financial performance. Secondly, the study documented that growth had a positive effect on financial performance. Thirdly, it was found that capital adequacy was positively related to financial performance. Fourthly, the study did not find any conclusive relationship between size and financial performance. Lastly, the study found that bank leverage and financial performance were negatively related. The implications of the findings are that at a micro-level, banks should observe prudent and stringent credit policies in-order to limit the incidence of non-performing loans.

Moreover, Berger & DeYoung (1997) investigated the intersection between the problem loan literature and the bank efficiency literature using Granger-causality approaches. It has been claimed that inadequate management in financial institutions leads to low-quality loans, which eventually contribute to an increase in the number of bad loans, or so-called nonperforming loans, which have a negative influence on the bank's profitability. Louhichi & Boujelbene (2020) conducted research to determine the shadow price of non-performing loans to assess the cost of banks' credit risk. Risk preferences are incorporated into an advanced model of a bank's production function in this study. They investigated and contrasted the perceived price of credit risk among Islamic and conventional banks operating in nine Middle Eastern and Asian countries using a quadratic directional distance function. Indeed, this function allows for the unequal handling of both desirable and undesirable inputs and outputs. In other words, it permits a bank's desired and unwanted inputs and outputs to be changed at the same time. In this study, NPLs are introduced into the production function as unwanted outcomes. They support this claim by conducting a risk-sensitivity analysis to see how different directional vector settings affect shadow

pricing. Using bootstrap regression, the factors that influence NPL pricing are investigated further. According to the findings, assessing bad loan shadow pricing can provide useful information for credit risk management and, as a result, credit risk reduction.

While Martiningtiyas & Nitinegeri (2020) looked into the impact of non-performing loans on bank profits. Profitability is the dependent variable in this study, whereas the independent variable is non-performing loans. The liquidity ratio, capital adequacy ratio, gross domestic product, and size are examples of control variables. Purposive sampling was used to choose 26 conventional banks that were listed on the Indonesian Stock Exchange between 2009 and 2017 According to the conclusions of this study, bank profitability is seriously impacted by non-performing loans. The liquidity ratio and gross domestic product have a strong positive impact on bank profitability; however, the capital adequacy ratio has little impact on bank profitability.

As discussed, Mohammed (2012) examined the performance of banks in relation to corporate governance, primarily using ratios of non-performing loans and loan deposits. The study was conducted in 9 banks in Nigeria for a period of 10 years from 2001-2010. The results of generalized least square regression show that the ratio of non-performing loans has a significant negative impact on performance while the ratio of loan deposits has an insignificant negative impact on performance. Therefore, maintaining superior asset quality and reducing the ratio of non-performing loans is essential for banks to survive.

In another paper, Trujillo-Ponce (2013) analyzed the factors of productivity among Spanish commercial banks over ten-years beginning in 1999. Using a sample of 89 banks and 697 observations. The results show that NPLs have a negative influence on both ROA and ROE at a particular level of significance.

Between 2004 and 2009, Andries (2011) studied the relationship between NPL and efficiency in the banking industry in Central and Eastern Europe. Their research revealed a statistically significant negative relationship between the two, which shows that banks should reduce their NPL levels as a way to increase their efficiency.

In this paper, Dongili & Zago (2005) did research the relationship between loan defaults and the financial performance of Italian commercial banks. They employed a statistical technique to support the claim that problem loans put commercial banks under a financial strain, and they discovered a high correlation between non-performing assets and the banks' economic performance.

Similarly, the same result was produced when (Do et al., 2020) researched the effect of non-performing loans on commercial banks: Case of Vietnam, he uses the fixed and random effects model, as well as the feasible general least square method to construct the test with panel data. The test results revealed that when the rate of nonperforming loans rises, the bank's return on assets (ROA) decreases, decreasing the bank's profitability. Furthermore, the findings of the study revealed that in the case of Vietnam, the loan-to-deposit rate and GDP growth both have an impact on the bank's performance, whereas the size of the bank has no bearing.

For the research, Kolapo et, al. (2012) employed a panel data set for five Nigerian commercial banks from 2000 to 2010. To investigate the quantitative effect of credit risk on the performance of commercial banks in Nigeria. Credit risk is measured by taking the ratio of nonperforming loans to loans plus advances, total loans to advances plus deposits, and the ratio of loan loss provisions while performance is measured by return on assets (ROA). The result suggested that the NPLs rate was statistically significant and negatively affects banks' profitability (ROA). They recommended that banks in Nigeria should enhance their capacity in credit analysis and loan administration

Nonetheless, the study of Kargi (2014) examined how credit risk affected the financial profitability of Nigerian banks. Financial ratios were taken from the annual reports and accounts of sampled banks from 2004 to 2008 and examined using descriptive, correlation, and regression techniques as indicators of bank performance and credit risk. The results showed that credit risk management significantly affects the financial profitability of Nigerian banks. It concluded that the number of advances, loans, non-performing loans,

and deposits had an adverse effect on the profitability of banks, exposing them to a huge risk of illiquidity and distress.

In a study published in 2015 Quang (2015) made an effort to determine the causes of the banking crisis in Vietnam. He detailed the connection between the banking crisis and bank performance. He came to the conclusion that the banking crisis typically happens when there are significant levels of NPLs and substantial borrowings from SBV using data samples from 30 commercial banks from the years 2005 to 2013. He also researched the alarming NPLs ratio threshold. He concluded that the optimal ratio in the Vietnam scenario should be 5.5% by using the noise-signal approach.

Kithinji (2010) at the Aibuma conference in Nairobi, Kenya, examined credit risk management and the profitability of commercial banks in Kenya. Profits were calculated using ROTA (Return on Total assets), while non-performing loans were calculated using non-performing loans/total loans. From 2004 to 2008, a trend of credit levels, nonperforming loans, and profitability was created. The association between the total amount of credit, non-performing loans, and profits over the research period was established using a regression model. R2 and a t-test with a 95% level of confidence were estimated. Her findings indicate that other factors besides credit and nonperforming loans have an impact on profits because the majority of commercial banks' profits are not affected by the volume of credit or nonperforming loans.

There is some research in the literature on the factors that affect Turkish bank profitability. According to Sayilgan (2009) equity to assets affects the ROA ratio positively while affecting ROE negatively. Additionally, the real interest rate, the ratio of securities to total assets, the share of the bank in the sector's total assets, and the open foreign exchange position have a positive impact on ROE, while the public sector's budget deficit and the ratios of credits and liquid assets to total assets have a positive impact on both ROA and ROE. On the other hand, net non-performing loans have a negative impact on ROA, and the ratios of staff costs and deposits to total assets have a negative impact on both ROA and ROE.

In an MBA project that was submitted to the University of Nairobi, Macharia (2012) examined the relationship between the level of nonperforming loans and the financial performance of Kenyan commercial banks. A multi-linear analytical model was utilized to analyze the relationship between commercial banks' financial performance and their NPL problem. After determining the level of NPLs across the banks and the total outstanding shares, the relationship between these variables was obtained. This required regressing the NPLs against the firm's ROA during the period of the study. According to the study's regression analysis, there is no relationship between earnings, credit availability, and the level of non-performing loans. The results show that the bulk of the profits of commercial banks is not influenced by the amount of credit and nonperforming loans suggesting that other variables other than credit and nonperforming loans impact profits. However, the study did not take into account other controllable variables, such as capital, liquidity, and management efficiency, that affect the profitability of commercial banks.

Adebisi et al. (2017) looked at how non-performing loans affected the profitability of Nigerian banks. The regression model was used to analyze the secondary data taken from the Annual Report and Statement of Accounts of the Nigeria Deposit Insurance Corporate (NDIC) over a period of seven (7) years (2006- 2012). The authors discovered a substantial negative relationship between non-performing loans (NPL) and return on assets (ROA), but a significant positive relationship between NPL and return on equity (ROE) of Nigerian banks.

Kaaya & Pastory (2013) in Tanzania worked with 11 commercial banks to perform a study. The findings demonstrated that NPL does not have any statistically significant impact on banks' performance or ROA. The study recommends the bank understudy increase the capital reserve to protect the bank from future losses and to increase bank credit risk management techniques.

However, Aamir Azeem and Amara (2020) investigated NPLs utilizing data from sixteen large banks from 2006 to 2012, regardless of size, ownership, or operation, using a panel fixed effect model. NPLs have been shown to have a negative influence on profitability. Increases in nonperforming loans have a negative impact on performance indicators such as

return on assets and return on equity, whereas stock returns are unaffected. Because of the rise in nonperforming loans, the return on assets is influenced more than the return on equity. The Bank of Punjab is the bank with the highest non-performing loans, while MCB has maintained profitability despite the poor economic conditions in Pakistan and has a small number of non-performing loans. According to (Martiningtiyas & Nitinegeri, 2020); (Hamid et al., 2017);(Berger & DeYoung, 1997);(Trujillo-Ponce, 2013) Nonperforming loans has a negative and significant impact on profitability.

2.3. Capital Adequacy Ratio and Profitability

Capital adequacy refers to the amount of capital a bank or other financial institution must have to meet regulatory requirements. The equity-to-total-asset ratio is used to assess a bank's capital adequacy. The percentage of a total asset that is financed using equity capital is calculated. As a result, capital adequacy refers to the level of equity that is sufficient to absorb shocks, Banks may have difficulties. (Kirui, 2014).

However, Martiningtiyas & Nitinegeri (2020) explain the capital adequacy ratio as a statistic used to evaluate a bank's capital ability to fund all of its business activities, including risky lending activity. Furthermore (Kirui, 2014)also explains that the higher the equity-to-asset ratio, the lower the predicted return. The greater the requirement for external capital, the higher the commercial bank's profitability. A bank with a greater capital-to-asset ratio is a better bank. Governments have strict regulations regarding bank capital requirements. Because highly leveraged corporations are more prone to assume excessive risk to increase shareholder profit at the expense of financing providers, capital adequacy is critical in lowering the number of bank failures and depositor losses when a bank fails (Kamau, 2009). The capital adequacy ratio protects consumers from unexpected losses and acts as a reserve in the event of a bank crisis (Martiningtiyas & Nitinegeri, 2020).

Further, as accounted for in the literature, the capital adequacy ratio contributes to banks' solvencies as it minimizes their risk of failure (Rahman et al., 2020). Besides, as a cushion to their operational efficiencies, the capital adequacy ratio enables banks to benchmark their risk levels (Sang, 2021) and credit risk management strategies. Anchored on the Basel

accord system, an increase in banks' capital ignites their efficiency performances and profitability to certain threshold levels (Charitou & Lois, 2020) which if not carefully monitored could lead to banks' financial instability and decline investors' trust. Nonetheless, as indicated by previous studies, there exist mixed findings as to the effects of capital adequacy ratio on banks' profitability. Drawing on the studies of Rohman et al., (2022); Hawaldar et al., (2022), the capital adequacy ratio together with was observed to have negative but significant effects on Indonesian banks' profitability as measured by their ROE and ROA. Similarly, the studies of Al-Sharkas & Al-Sharkas, (2022) show inverse relationships between emerging markets banks' ROA and their capital ratio, although an opposite result was found to exist with ROE being put into consideration. Thus, the extent to which the capital adequacy ratio affects banks' profitability depends on whether ROE or ROA is used as proxies to measure profitability. On the other side of the spectrum, studies have also indicated ROA exerting effects on banks' capital adequacy ratio together with other financial metrics (Keqa, 2021).

More so, evidence has indicated capital adequacy ratio buffers banks' profitability (H. U. Rahman et al., 2020); (Twum et al., 2022); (Karim et al., 2021), thus, warranting managers to employ stringent decisions toward their capital flows and profit margins. This is further supported by the findings of Sang, (2021) which indicate the positive effects of the capital adequacy ratio on Vietnamese commercial banks' financial stability. Additionally, by exploring determinants of Ethiopian banks' profitability, results have shown capital adequacy ratio together with the liquidity ratio, real GDP, and bank size hold a significant and positive impact on the bank's profitability (Isayas, 2022). Besides, similar studies have also indicated interest margin and capital adequacy ratio influence United States banks' profitability levels (Charitou & Lois, 2020). However, by utilizing the fixed effects estimation technique on data derived from 11 banks in the periods of 2006-2016, the results of (Madugu et al., 2020a) show negative effects of capital adequacy ratio and domestic banks' financial performance.

Furthermore, Ejoh & Iwara (2014) examined the Impact of Capital Adequacy on Deposit Money Banks' Profitability in Nigeria, The major goal of this research is to empirically

assess the influence of capital adequacy on Deposit Money Banks' profitability in Nigeria, using a case study of five selected banks. The empirical analysis covered the period from 1981 to 2011. The annual reports and financial statements of the selected banks as well as the CBN statistical bulletin were used as secondary sources to gather the data for the study. The Engle and Granger two-step co-integration approach was used in the study. According to the study, capital adequacy is crucial in explaining banks' Returns on Assets (ROA), a metric of their profitability. The relationship between capital adequacy and bank profitability is positive and significant, suggesting that banks with more equity capital are perceived to have more safety and such advantage can be translated into higher profitability. A bank will be more profitable with a larger capital ratio. Based on the findings, it was advised that the minimum capital requirements for deposit money institutions in Nigeria be continuously reviewed to the optimal point. Additionally, Nigerian banks need to be adequately capitalized so they may access more affordable sources of funding and increase profits. Doing so will assist the public to maintain confidence in the banks and meet client credit needs.

Moreover, Ogboi, Charles, and Unuafe (2013) did a study on the impact of credit risk management and capital sufficiency on banks' financial performance in Nigeria using a time series and cross-sectional data from selected banks' annual reports and accounts from 2004 to 2009. This is to provide more empirical information on the impact of credit risk management methods and capital adequacy variables on bank profitability in Nigeria. The link between loan loss provisions (LLP), loans and advances (LA), non-performing loans (NPL), capital adequacy (CA), and return on asset (ROA) was estimated using a panel data model (ROA). The findings revealed that good credit risk management and capital adequacy have a positive impact on a bank's financial performance.

Likewise, Ngo (2006) sought to understand the relationship between banking profitability and endogenous capital. He looked at the relationship between bank profitability and capital. To the best of his knowledge and based on his research, no previous work has examined the issue using a two-equation structural model. His results were consistent with the idea that, although raising capital is expensive for banks, it is associated with offsetting

advantages that outweigh these additional costs, given non-binding capital requirements. Consequently, no systematic relationship between capital and profit is anticipated when the capital structure is endogenously determined in a profit-maximizing equilibrium.

Similarly, Olalekan & Adeyinka (2013) aims to determine the impact of capital adequacy on the profitability of both international and domestic banks in Nigeria. The report presents original data obtained through surveys issued to bank employees, with a response rate of 76 percent. From 2006 to 2010, published bank financial statements were also used. The main data analysis found no significant association, however secondary data analysis demonstrated a positive and substantial relationship between capital adequacy and bank profitability. This means that capital adequacy is a critical factor in determining profitability for deposit-taking banks in Nigeria.

More so Ajayi et al. (2019) examined the effect of capital adequacy ratio (CAR) on the profitability of Deposit Money Banks (DMBs) as obtained from their annual report for 2017 using their Return on Assets (ROA) as a profitability parameter. OLS method was used via SPSS 20.0 to run the data used in the research. The findings show a strong positive relationship between the capital adequacy ratio (CAR) and profitability (ROA) of Deposit Money Banks (DMB)'S in Nigeria and recommend that to sustain the financial health and stability of banks in Nigeria, authorities should place equal emphasis on strategic monitoring and evaluation as well as Capital Adequacy.

Various authors like Kirui (2014), Kamau (2009), Ogboi, Charles, and Unuafe (2013), and Olalekan & Adeyinka (2013) found that the capital adequacy ratio has a significant and positive impact on profitability. They further state a bank with a greater capital-to-asset ratio is a better bank.

2.4. Bank Size and Profitability

The size of a bank is measured using a bank size indicator. The amount of revenue received by the company is influenced by its size. The profitability of a bank increases as the bank grows in size (Anggari & Dana, 2020). Furthermore, as large banks can engage in a wide range of operations, they can diversify their portfolio and, as a result, reduce credit risk (M.

M. Rahman et al., 2015). The total asset size of the banks is used as a proxy for bank size in most finance literature. The natural logarithm of total assets is used to calculate the size of a bank (log A).

There has been an argument that says the smaller the bank size the higher the profitability of the bank, which can be justified for many reasons. One of the reasons that could account for the decline in profitability for large banks is the enormous startup cost for this institution, such as technological high costs like computer mainframes that are too expensive, and software costs that lower the profitability rates. On the other hand, large banks find it difficult to invest in their high liquidity in comparison to small and medium-sized banks (Aladwan, 2015).

However, Aladwan (2015) investigated the impact of bank size on profitability " and empirical study on listed Jordanian commercial banks", data for the year 2007 to 2012 were used to classify banks into three categories according to the size of their assets, concerning their total assets. The study used a two-sample t-test on the means of ROE for the three selected groups. The results show that each of the samples has a statistically different mean than the other. Also, the analysis reveals that profitability increases as asset size decreases. The regression results also revealed that asset size has a negative significant relationship with profitability.

Furthermore, Parvin et al. (2019) conducted research on the effect of liquidity and bank size on the profitability of commercial banks in Bangladesh. Statistics were used to determine the results of the study. The findings of the study indicate that the loan-to-assets ratio (LAR) positively affected the profitability indicator ratio (ROA) of the banks. It was observed that the larger the bank size the greater the return on assets of the banks. On the other hand, there was a negative impact of the deposit-to-assets ratio (DAR) on profitability. Overall the correlation results indicated that liquidity and bank size do not have any significant influence on banks' profitability.

According to (Mamatzakis & Remoundos, 2003) the factors that are most important in explaining profitability are those that are directly related to the strategic planning of the

banks (e.g., personnel costs, loans to assets ratio, equity to assets ratio). According to their findings, economies of scale play a significant role in the market and has a positive impact on profitability. Mamatzakis and Remoundos' analysis also reveals that the size of the market, an external variable, defined by the supply of money, significantly influences profitability.

In the ten Middle East and North African (MENA) nations from 2000 to 2008, (Olson & Zoubi, 2011) compared accounting profitability measurements of banks with economic determinants. Cost and benefit efficiencies were employed as economic determinants, and ROA and ROE were used as a proxy for accounting profitability. The study concluded that a bank's size has a positive effect on the banks accounting measures of profitability. Additionally, it was discovered that cost-effectiveness has a negative effect on profitability.

Moreover, Anber et al. (2011) examined bank-specific and macroeconomic determinants of commercial bank profitability: empirical evidence from Turkey, over the period of 2002-2010. The results show that asset size has a positive and significant effect on profitability. The study suggests that larger banks achieve a higher ROA and ROE, also the positive coefficients of asset size variable provide evidence for the economies of scale theory. The ratio of loans/assets and loans under follow-up/ loans have a negative and significant impact on profitability (ROA). Non-interest income/assets ratio has a positive and significant effect on ROA. Only real interest rate is found to have a positive effect on profitability (ROE). The remaining bank-specific factors (capital adequacy, liquidity, deposits/assets ratio, and net interest margin) have no significant effect on bank profitability.

Furthermore, Flamini, Calvin & Liliana (2009) investigated the factors that affect bank profitability using a sample of 389 banks from 41 SSA nations. They discovered that apart from credit risk, higher returns on assets are associated with larger bank size, activity diversification, and private ownership. Macroeconomic factors have an impact on bank returns, indicating that macroeconomic policies that support low inflation and steady GDP

growth encourage loan expansion. Their findings also indicated moderate persistence in profitability.

While, Rohman et al. (2022) investigated the determinants of Indonesian banking profitability: before and during the COVID-19 pandemic, analysis for 43 banks using return on assets (ROA), return on equity (ROE), and net interest margin (NIM) as a measure for profitability. The results of the regression analysis show that banks' profitability declined during the pandemic compared to before the pandemic. Other findings demonstrate that both before and during the pandemic capital adequacy ratio (CAR) and non-performing loans (NPL) affect profitability negatively. However, bank size (BS) and liquidity have little impact on the profitability of Indonesian banking (ROA, ROE, and NIM). The study recommended the Indonesian government through the financial service authority (OJK) and bank Indonesia issue policies that will encourage banks to operate better.

Furthermore, Ostadi & Monsef (2014) concentrated on the factors affecting the profitability of business banks in Iran. Profitability (as determined by ROE and ROA) was the dependent variable, whereas bank deposits, bank size, bank capital, liquidity problems, and keeping money prerequisites were independent variables. The findings indicated that bank size and bank concentration have a significant impact on banks' profitability.

Another study Ally (2014) investigates the determinants of banks' profitability in a developing economy: empirical evidence from Tanzania. The results of the study were in line with several earlier ones, which indicated that the profitability of Tanzanian banks is significantly impacted by factors such as bank size, capital sufficiency, asset quality, expense control, and liquidity management. According to the findings, larger banks make more money, and increased bank capital assets quality, effective expense management, and liquidity management all help the Tanzanian banks grow and make more profit. The real GDP growth, inflation rate, and real interest rate are macroeconomic determinants, but they do not significantly affect bank profitability. Overall findings indicate that bank-specific factors or internal factors influenced by bank management decisions and policy aims have a significant impact on the profitability of banks in Tanzania. Macroeconomic factors, however, do not seem to have any significant effect on profitability. The study recommends

that policymakers and bank management should formulate and implement better policies and strategies which may result in better performance of banks.

There aren't many researches examining the factors that affect Chinese banks' profitability. A principle component approach is used by Wu et al. (2007) they compare the performance of Chinese banks using several bank-specific factors. The findings indicate that there is no relationship between bank size and profitability.

Furthermore, Anggari & Dana (2020) investigated the effect of capital adequacy ratio, third-party funds, loan-to-deposit ratio, and bank size on the profitability of banking companies on IDX. The result of the study indicated that capital adequacy ratio, third-party fund, and bank size have a positive and significant effect on profitability. Meanwhile, the loan-to-deposit ratio has a positive and insignificant effect on the profitability of banking companies in the Indonesian stock exchange during the 2016-2018 period. The study recommends banks increase lending to increase company profits by paying attention to the quantity of lending and maintaining the offered loan interest rate.

2.5. Gross Domestic Product (GDP) and Profitability

Gross domestic products (GDP) are a macroeconomic indicator that measures a country's entire economic activities. As an engine of economic growth, banks ignite the economic performances of countries through their intermediation roles between lenders and borrowers (Jeris, 2021). Thus, studies have indicated macroeconomic variables like GDP have proportional relationships with firms' ROA (Chukwuogor et al., 2021) as an increase in individual and government income leads to higher financial gains by banks. Although, the findings show an opposite result which indicates a negative association between Islamic banks' ROA and GDP growth rates. This was further strengthened by the studies of de Leon (2020) which indicates GDP growth rates and Asian banks' ROE have an inverse relationship.

Nonetheless, by evaluating the impacts of economic prosperity on Jordanian banks' profitability, the findings of (Alkhazaleh, 2017) show the significant and positive relationships between economic growth as measured by GDP and the banks' financial performances, thus, arguing that changes in profitability as measured by ROA, credit facilities, and deposits will exert an influencing effect on the economic growth of the country. Thus, as the center of discussion, authors like Martiningtiyas & Nitinegeri, (2020) have identified GDP as a metric for calculating total community income and total expenditure on products and services produced in a country's economy, which reflects the level of efficiency in production and value chain activities of a country.

Further, as accounted in the literature, findings have indicated that GDP together with other macroeconomic indicators exerts significant influences on banks' profitability (Sahiti & Sahiti, 2021); (Li et al., 2021); (M. M. Rahman et al., 2015). Thus, intending to determine United States banks' profitability, the studies of Chukwuogor et al. (2021) show significant effects of macroeconomic variables on banks' profitability performances. Besides, the significant impact of macroeconomic variables on reductions of banks' chances of failure has been shown by the results of (Lin & Yang, 2016). In a similar vein, GDP was observed to have significant effects on Nepalese commercial banks' profitability (Singh et al., 2021) which shows its significance to their survival and prosperity. Moreover, by utilizing a random-effects modeling technique, the findings of A-qudah (2020) provide evidence of the significance of macroeconomic variables on Jordanian banks' liquidity positions. Similarly, NPLs, market risk, and GDP growth rates were also found to have a strong and significant impact on small and medium-sized banks' profitability (Butt & Strtak, 2020).

From 1999 to 2005 Sufian & Habibullah (2009) concentrated on the internal and external factors that affected the profitability of Thai banks. The dependent variables used were ROA and ROE. The study found that capitalization, bank size, and economic growth all had positive effects on bank profitability, but non-interest income, per-capita GDP, credit risk, and overhead costs had negative effects.

In their study, Kunt & Huizinga (1998) found that the real GDP growth rate, inflation rate, real interest rate, the ratio of non-interest income to total assets, and the ratio of taxes to

profit before taxes, all had a positive impact on ROA while the ratio of non-interest expenditures to total assets affected ROA negatively in the Hong Kong banking sector during 1992-2002.

Liu & Wilson (2010) examines the profitability of banks in japan for a sample of banks with different ownership structures (city, trust, regional, second association regional, shinkin, and other credit cooperation). They concluded that the impact of real GDP growth on bank profitability is conflicting across ownership types but there is some evidence that the growth of GDP may induce competition resulting in a decrease in bank profit. There is also evidence of the negative impact of stock market development on Japanese banks' profitability, but this relationship does not hold for city and trust banks. They also find evidence that well-capitalized, efficient banks with lower credit risks tend to outperform less-capitalized, less efficient counterparts with higher credit risks. The results suggest that policies that encourage banks to diversify their revenue streams, improve their capital levels, and lower costs relative to income could generate significant welfare gains for the banking industry in japan.

The system GMM estimation is used by Heffernan & Fu (2011) to analyze the influence of bank-specific and macroeconomic determinants of profitability in China. The findings indicate that GDP growth and the unemployment rate are significantly correlated with bank profitability in China, whereas non-traditional business and bank size have insignificant correlations.

Similarly Tan & Floros (2012) researched bank profitability and GDP growth in China: a note. Using the period of 2003-2009. The empirical findings suggest that cost efficiency is positively related to bank profitability. While lower profitability can also be explained by higher taxes paid by banks. Furthermore, there is a negative relationship between GDP growth and bank profitability. Their findings also demonstrate that (1) the profitability in the Chinese banking industry is significantly affected by the level of non-performing loans, and (2) Chinese banks with higher levels of capital have lower profitability. They show that higher GDP growth leads to lower bank profitability in china with the recommendation that

the overhead costs should be better controlled to increase efficiency (The profitability of banks is positively impacted by bank efficiency).

According to research conducted in Switzerland by Dietrich & Wanzenried (2009), there are considerable variances in the profitability of commercial banks, and these discrepancies may be largely accounted for by the criteria considered in the analysis. Better capitalized banks are been profitable. Additionally, a bank's profitability will benefit if its loan volume is increasing faster than the market. They discover that banks that generate a larger share of interest income are less profitable. The GDP growth variable, which has a positive impact on bank profitability, and the effective tax rate and market concentration rate, both of which have a large negative impact on bank profitability in Switzerland, are the most important factors.

According to Yüksel et al. (2018) examined the determinants of profitability in the banking sector: an analysis of post-soviet countries using annual data between 1996 to 2016 and analyzed data utilizing the generalized method of moments (GMM) and fixed effects panel regression. They concluded that higher GDP comes with higher bank profitability for post-soviet countries. Lastly, there is a negative relationship between the loan-to-GDP ratio and the profitability of banks in post-soviet countries. They suggest banks in post-soviet countries focus on ways to increase their non-interest income. And also significant for banks to be careful and risk-averse when lending to their customers.

In their study using data from 80 countries between 1988 and 1995, Kunt & Huizinga (1998) found that ROA was positively impacted by GDP per capita, inflation rate, real interest rate, capital adequacy, and foreign ownership, while negatively impacted by the ratio of non-interest earning assets to total assets and the ratio of deposits to total liabilities.

On the contrary, Ebenezer et al. (2017) investigated bank-specific and macroeconomic determinants of commercial bank profitability: empirical evidence from Nigeria. Using the balance panel data set, the empirical results of the study show that capital adequacy and liquidity have a positive and significant effect on bank profitability. However, the efficiency ratio has a negative and significant relationship with profitability. With regards

to the macroeconomic variable GDP growth also have a positive and significant impact on banks' profitability. The empirical results of the study suggested that banks can improve their profitability by increasing capital and liquidity and decreasing operating costs with conscious efforts to maintain transparency in their operations.

The impact of a selected set of determinants on banks' profitability in the South Eastern European region between 1998 and 2002 was examined by (Athanasoglou et al., 2006). They discovered that concentration and inflation have a positive correlation with bank profitability and that real GDP per capita fluctuations have no impact on banks' profitability.

For the years 1994 to 2001 M. Kabir (2003) looked at the performance of Islamic banks. Internal (overheads, liquidity, leverage ratios, earnings, and fund management ratio) and external (GDP per capita, taxation, financial indicators, and real interest rate) elements have considerable impacts on bank profitability and efficiency, according to the researchers. They concluded that bank profitability would rise when capital and loan-to-asset ratios rose. They presented evidence that this conclusion stays true even after accounting for several factors such as taxation, market arrangements, and economic situations. They also discovered that macroeconomic variables had a beneficial impact on bank performance, whereas taxes have a negative impact.

3. DATA AND METHODOLOGY

In this chapter, the empirical methodology employed to study the impact of Non-Performing Loans on bank profitability is presented. The objective of the research is to study the effect of non-performing loan banks' profitability in South Africa and Malaysia. Similar to Martiningtiyas & Nitinegeri (2020), Kingu et al. (2018) this study adopted the econometrics research methodology. The study uses secondary data on all the variables of interest to study the relationship between profitability and non-performing loans.

3.1. Data

Before the collection of any data, a sample design is a definite plan that helps to obtain a sample from a given population (Panta & Alshebami, 2018). Accordingly, the study was confined to twelve (12) banks, from six (6) Malaysian banks and six (6) South African banks that are registered and are open for business between 2008 and 2020, The period was chosen to cover a reasonable extent the period of various reforms in the banking sector and because of the availability of data. Secondary sources of data are favored because, secondary data are those that are already available i.e., those that have previously been gathered and examined by someone else, (Panta & Alshebami, 2018). The study gathered data side up of Return on Assets (ROA), Non-Performing Loans ratios (NPL), Capital adequacy ratio (CAR), and Bank Size (BS) which were calculated from the Thomson Reuters database and published financial statements, data for macroeconomic variable i.e. Gross domestic product (GDP) is extracted from the world bank database. Data obtained from various sources, validated, and placed into a simple excel application to prepare it for analysis, and then processed and analyzed using the STATA software package. The nature of the variables under inquiry is described using descriptive statistics such as mean, standard deviation, minimum, and maximum values.

3.2. Measurement of Variables

3.2.1. Dependent Variable

Return on asset (ROA) is a dependent variable in this study; it is derived by dividing net earnings after taxes by total assets at the end of the financial year. ROA is a performance indicator that gauges how profitable banks are with their assets, or how efficient management is in generating profit from the company's assets. Higher ROA, on average, implies that a company's assets are being used effectively and efficiently to generate profits. ROA was collected from published yearly financial statements of commercial banks and Thompson Reuters database for this study.

3.2.2. Independent Variable

The Non-Performing Loans (NPL) ratio is a credit risk indicator that is produced by dividing non-performing loans by total loans and advances. The higher the NPL ratio, the worse the credit quality and, as a result, the greater the possibility of additional loan losses being charged against income.

3.2.3. Control Variables

The capital adequacy ratio (CAR) is the proportion of a bank's capital to its total assets. This ratio compares the amount of capital a bank has to the amount of risk-weighted credit exposure it has. CAR is defined as the ratio of shareholders' funds or equity to total assets in the context of this thesis.

Bank Size (BS) is calculated using the bank's total assets. The relationship between bank size and profitability has been investigated in several nations, with mixed results. According to Anggari & Dana (2020), larger banks are more vulnerable to information asymmetry. Berger & DeYoung (1997) on the other hand, found an inverse link between bank size and profitability, suggesting that banks with a greater pool of capital can make better investments and minimize bankruptcy costs.

Gross Domestic Product (GDP) The difference between the current year's GDP and the previous year's GDP is divided by the previous year's GDP to compute annual GDP growth. The GDP is a macroeconomic variable that attracts a lot of attention from academics. Do et al. (2020) investigation into banking in Vietnam revealed a link between GDP growth and bank profitability.

3.3. Hypotheses

Based on the early literature and variables of study following hypotheses are formulated:

H1: There is a negative relationship between non-performing loans and profitability.

H2: The capital adequacy ratio has a positive effect on profitability.

H3: Bank size has a positive relationship with profitability

H4: There is a positive relationship between GDP and banks' profitability

3.4. Test for Significance

A preliminary test is estimated to determine the significance of the relationship using; Augmented dickey fuller test, Variance inflation factor (VIF), Durbin-Watson test, two-tailed test, and Correlation coefficient using STATA. The augmented dickey fuller test showed the stationarity of a series. VIF measures the strength of the correlation between the independent variables in the regression analysis. Durbin-Watson detects autocorrelation in the residuals from the regression analysis. A two-tailed test is used to test against the alternative that the variances are not equal. The correlation coefficient measures the relationship between two variables.

3.5. Test for Cross-Sectional Dependency

The horizontal section dependency is the property that the shock that occurs in any of the horizontal cross-sectional units that make up the panel data set affects all units at the same level. You can check for this condition with the Pesaran (2004) CD test or the Breusch-

Pagan (1980) LM test. The time dimension T is smaller than the unit size N, hence the Breusch-Pagan cross-sectional density test was applied in this investigation.

3.6. Hausman Tests

The Hausman post-estimation test is a test to establish the null of no dependence between the random individual effects and the explanatory variables. The Hausman test is employed to determine the efficient estimator between fixed effect estimators and random effect estimators. Thus, under the test specification the random effect estimator is the efficient estimator, therefore a p-value less than 0.05 leads to the rejection of the null hypothesis in favor of the alternative fixed effect estimator. Further, the test is not limited to comparing only fixed effect estimation and random effect estimator, as can be seen in this paper pooled cross-sectional estimator is also compared with both the fixed effect estimator and the random effect estimator.

3.7. Panel Data

In this paper, the data used to model the relationship between bank profitability and non-performing loans is longitudinal in nature. Thus, we employed a panel data estimation technique to determine the effect of non-performing loans on bank profitability. Panel data is a combination of inter-individual bank disparities and their intra-individual differences. This makes the data very useful and efficient in estimating the causal effect of nonperforming loans. Furthermore, because it contains a lot of sample variation than other forms of data, therefore, improves the efficiency of the estimation than other forms of data which improves the efficiency of the estimation Hsiao (1995). Due to the complex nature of the world, panel data can capture some underlining complexities of human behavior. It also controls the impact of omitted variables and can reveal many dynamic associations between variables. There are two main methods of panel data estimation; however, this study employed fixed effect estimation.

3.8. Fixed Effect (FE)

In fixed effect models, the unobserved phenomenon can have a relationship with the explanatory variables. The model then controls for the impact of the time-invariant independent variables with time-invariant effects. This applies to both the observed and unobserved variables. Thus, in the fixed effect model, the individual-specific effects are random.

Suppose the observed explanatory variables are a recap X_{It}, the error term is v_{It}, the dependent variable is Y_{It}, and a constant $\propto$. The fixed effect model can be specified as follows:

$Y_{it=} \propto +\beta_1 X_{It} + v_{It}$
(1)

$v_{it} = \cap_i + \in_{It}$
(2)

The error term has two components, the time-invariant part $\cap_i$ and $\in_{It}$ the part that varies over time. In this model $\cap_i$ and the explanatory variables are assumed to be correlated. The advantage of the fixed effect model is that even if this part of the conditional independence assumption (CIA) is not met, the model gives consistent estimates of a causal effect.

3.9. Techniques of Estimation

Bank profitability is modeled to be dependent on non-performing loans plus other control variables. The variable of interest is non-performing loans but to isolate the effect of nonperforming loans, other variables are controlled for in the model, such that non-performing loans are not correlated with the time-varying component of the error term v_{it}. Since the goal of the study is to determine the degree of the effect of non-performing loans on banks in Malaysia and South Africa two separate models are estimated for each country. For each country, two fixed effect models are estimated. First with only nonperforming loans as an explanatory variable and second controlled variables are added to non-

performing loans in estimating the effect of non-performing loans on bank profitability. This strategy helps in analyzing the consistency and robustness of the effect of non-performing loans on bank profitability.

3.10. Model Specification

In this study, the goal is to analyze the effect of non-performing loans on Returns on Assets as a proxy for bank profitability. This is studied based on the assumption that when the default rate of loans classified as nonperforming loans rises, the ability of the bank to obtain more funds from the delinquent debtors becomes extremely daunting as the banks are the risk of losing both the principal and interest income. Because the loans no longer generate desired income for the bank because the borrower does not fulfill its obligations to the bank. Thus, nonperforming loans can lead to problems for banks since they are at risk of losing their principal and the interest but further this loan could have been invested in other revenue-generating investment portfolios. Thus, nonperforming loans enter this model as negatively affecting the profitability of banks as found in many empirical studies on the topic. Capital adequacy ratio, bank size, and gross domestic profit enter the model as positively impacting the profitability of banks based on the overwhelming evidence from studies done on the topic. The models are specified as:

$$ROA_{it=} \propto +\beta_1 NPL_{It} + \beta_2 X_{It} + v_{It} \quad (3)$$

$$v_{it} = \cap_i + \in_{It} \quad (4)$$

Where ROA is the returns on assets. ROA is one of the main indicators of a bank's profitability and many studies such as Kingu et al. (2018), Martiningtiyas & Nitinegeri (2020) and Panta & Alshebami (2018) all used ROA as a proxy for bank profitability when studying the relationship Non-performing loans and bank profitability. NPL is the non-performing loans of the banks,1 is the causal, effect of non-performing loans on banks' profitability, Xit is the matrix of the other control variables such as capital adequacy ratio, bank size, and gross domestic product of both countries. vit is the error term; it has two components, the time-invariant component and the part that varies over time.

4. EMPIRICAL FINDINGS

This section analyses and interprets the findings of this paper. A summary of the data and its specifications are also presented.

4.1. Descriptive Analysis

This subsection employs both graphical analyses and summary statistics of all the variables used in this study for both countries.

4.1.2. Returns on Assets versus Non-performing Loans

From graph 3 below, the Returns on Assets of all the selected banks were growing at a flat rate except bank number five which was relatively higher compared to the other banks from the year 2008 to the year 2010 but falling towards the zero growth rates just like the other banks. For all the six South African banks the returns on assets on average do not show any economically significant changes in it for the entire period under study. Unlike the returns on assets, the non-performing loans of all six South African banks were relatively volatile compared to returns on assets. Banks one, four, five, and six have similar non-performing loan growth trends. The non-performing loans in all these four banks were increasing at the beginning of the period under study, then they peaked at their local maximum and they started falling until they reached a minimum point in the middle of the period under study. From there they started rising until they reach the levels of growth they realized at the beginning of the period under study, except bank five which peaked before the end of the period under study and started falling towards the end of the period under study. These trends show some underlining similarities between these four banks. Banks two and three similar to the other four banks have similar growth trends in non-performing loans. Their non-performing loans peaked at a maximum at the beginning of the period under study and started falling for the rest of the period under study except for a one-period shock two years before the end of the period under study then reverted to its falling growth rate. From the graphs, no notable association can be deduced between non-performing loans and returns on assets for all the six South African banks studied in this paper.

Similar to the South African banks, the following Malaysian banks namely: banks seven, nine, and ten have similar growth trends. They all peaked at a local maximum at the beginning of the period under study and then started falling in the middle of the period under study, then peaked at a local

minimum then started rising for the rest of the period under study. Banks eight and twelve have similar growth trends regarding non-performing loans. They both peaked at their maximum at the beginning of the period under study and then started falling for the rest of the period under study. This growth trend of non-performing loans is the idle scenario for all profit-seeking banks. Bank eleven seems to be an outlier as its non-performing loans are relatively growing at a low but flat rate for the entire periods under study in this paper. Unlike South African Banks, for Malaysian banks, there seems to be some form of an inverse relationship between non-performing loans and returns on assets.

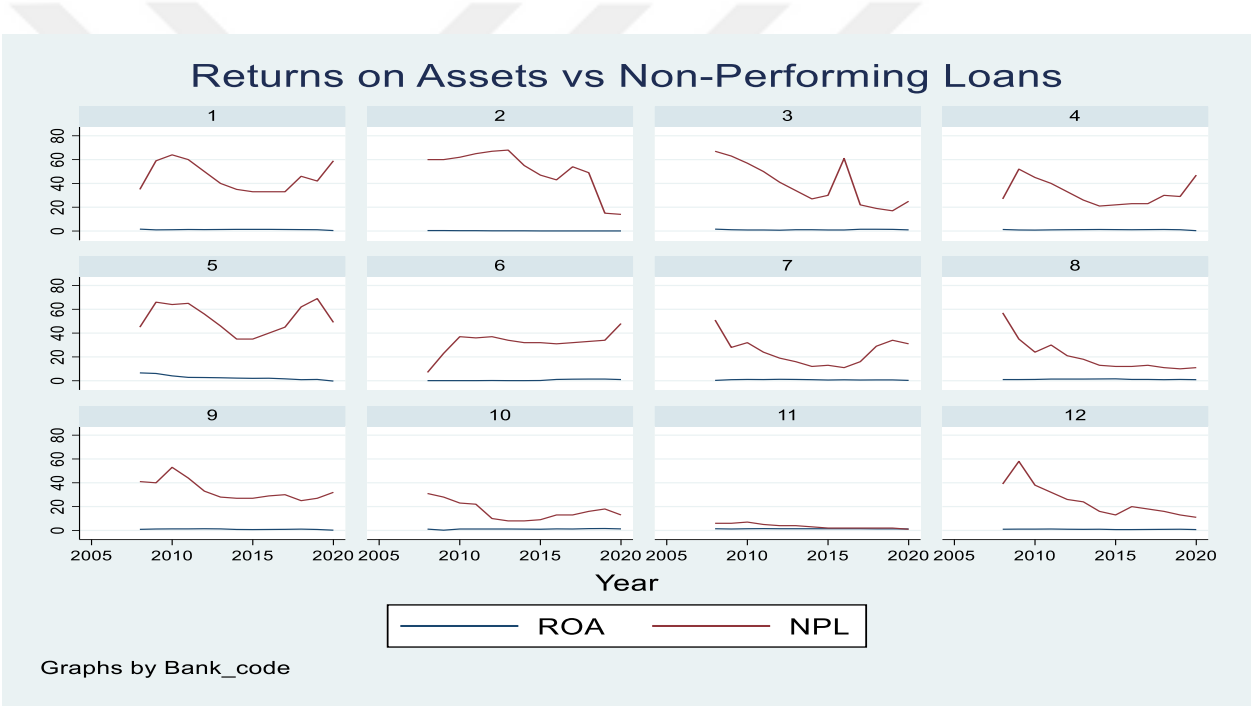


Figure 3. Returns on Assets versus Non-Performing Loans

This graph depicts the relationship between returns on assets and non-performing loans for each of the 12 banks used in this study, 1 to 6 are from South Africa and the rest is from Malaysia.

From Table 1 and Table 2 below, the returns on assets of both the South African (1.1) and Malaysian banks (1.0) show relatively similar means, however, the returns on assets of South African banks are relatively more volatile than that of the Malaysian banks. South African banks realize a relatively higher non-performing (41.79)

Table 1. Summary Statistics of South African Bank

Variables	Mean	Standard deviation	Minimum	Maximum	Observations
ROA	1.132051	1.130853	-.3	6.6	78
NPL	41.94872	15.54039	7	69	78
BS	5.653846	.8747085	3.5	7.2	78
GDP	2.569231	.0609613	2.5	2.7	78
CAR	18.32179	10.00042	6.5	43	78

This table presents the descriptive of the variables associated with the Six South African Banks.

loans compared to Malaysian banks (20.5). Furthermore, the non-performing loans of South Africa are relatively more volatile compared to that of Malaysian banks. This shows that Malaysian banks are managing their loans more effectively than South African banks. The Bank size and GDP of both countries show similar means but the variables are relatively volatile in Malaysia. The capital adequacy ratio is higher in South African banks (18.3) relative to Malaysian banks (14.9) and it is also more volatile in South Africa which indicates that South African banks' capital structures are healthier and stronger. Because of this high CAR, banks may be more aggressive in their pursuit of opportunities, resulting in increased risk-taking and riskier credit portfolios (Demirgüç-Kunt & Huizinga, 1999). These riskier loan portfolios may lead to non-performing loans. This could explain the reason why South Africa has the highest number of non-performing loans.

Table 2. Summary Statistics of Malaysian Bank

Variables	Mean	Standard deviation	Minimum	Maximum	Observations
ROA	1.067949	.3135443	.2	1.6	78
NPL	20.52564	13.58449	1	58	78
BS	5.761538	1.307643	4.5	8.8	78
GDP	2.753846	2.323661	2.3	23	78
CAR	14.90513	3.063904	8.3	23.3	78

This table presents the descriptive of the variables associated with the Six Malaysian Banks

Table 3. VIF TEST for multicollinearity South Africa

Variable	VIF	1/VIF
car	1.47	0.682524
bs	1.32	0.758741
npl1	1.14	0.874758
gdp	1.02	0.984077
Mean VIF	1.24	

Table 4. VIF TEST for multicollinearity Malaysia

Variable	VIF	1/VIF
npl1	1.19	0.840375
bs	1.12	0.890989
car	1.10	0.910840
gdp	1.02	0.982011
Mean VIF	1.11	

Multicollinearity is the phenomenon where the independent variables in the research model have a linear relationship. When the VIF index is greater than 10, there is a high degree of multicollinearity among variables. Based on the results of the multicollinearity test for both South Africa and Malaysia as seen in the tables above, it can be concluded that there is no correlation between the independent variables in the regression model or multicollinearity does not occur. This conclusion was drawn because the VIF values are smaller than 10 for both countries.

4.2. Hausman test results

	---- Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	FE	RE	Difference	Std. err.
NPL	.0152833	.00584	.0094434	.0072384
CAR	.0660854	.0568663	.0092191	.0055609
BS	-.6033358	-.1386808	-.464655	.1665297
GDP	-.0400074	-.0403589	.0003515	.0019666

chi2(4) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B) = 14.69 Prob > chi2 = 0.0054

The Hausman test for difference in parameters between the fixed and random effect model has a p-value of 0.0054. Therefore, in this study, the fixed effect model is preferred over the random effect estimator.

4.3. The Panel Regression

Table 5, present combine pooled regression, a random effect, and a fixed effect model with the same sample of banks in Malaysia and South Africa.

Table 5. Panel Regression

	Pooled	Random Effect	Fixed Effect
NPL	-0.0384	0.0153	0.00584
	(-1.08)	(0.51)	(0.19)
CAR	0.00727	0.0661***	0.0569***
	(0.73)	(4.91)	(4.44)
BS	0.158*	-0.603**	-0.139
	(2.56)	(-2.79)	(-0.92)
GDP	-0.0394	-0.0400	-0.0404
	(-0.98)	(-1.40)	(-1.36)
Country	-0.154		0.169
	(-0.97)		(0.38)
Constant	0.563	3.493**	0.778
	(1.09)	(2.64)	(0.65)
N	156	156	156
adj. R-sq	0.023	0.153	

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

The Hausman test for difference in parameters between the fixed and random effect model has a p-value of 0.005, suggesting that the fixed effect model is preferred. Fortunately, the preferred model, Fixed effect estimates, controls for both autocorrelation and heteroskedasticity. However, it is worth mentioning that a Wooldridge test for autocorrelation will reject the null of no first-ordered autocorrelation (Born & Breitung, 2016). The coefficient of the capital adequacy ratio is positive and significant the results indicate that a rise in capital adequacy ratio can explain a rise in bank profits. The fact that banks with greater capital ratios rely on their capital to finance asset expansion could be one explanation for this. This reduces reliance on costly external funding capital and

therefore leads to higher profitability. These findings are in line with those of (Ajayi et, al. 2019)(Olalekan & Adeyinka, 2013) and (Kirui, 2014). The coefficient of Bank size has a negative and significant relationship with profitability (ROA), which means that profitability increases as bank size decreases. This finding is supported by (Aladwan, 2015).

Table 6. Durbin-Watson Test for Autocorrelation

COUNTRY	**p-values**	**conclusions**
South Africa	0.7326941	No autocorrelation
Malaysia	0.7922866	No autocorrelation

Durbin-Watson is used to test for serial correlation. The null in both tests is that there is no serial correlation between the error of the intruder in the t period and the error of the intruder in the t-1 period (before). Based on the Table above, the P values obtained from the regression model for both countries are 0.7326941 and 0.7922866 respectively. Since P values are above the significant level of 0.5, it means that there is no autocorrelation.

Table 7 below shows the two sample test statistics for the equality of the means of the two variables. The results indicate that statistically there is no significant difference between the returns on assets of banks in both South Africa and Malaysia. The null hypothesis is not rejected with a p-value greater than 0.05 for all three different cases. Hence regarding returns on assets, the six selected banks in both South Africa and Malaysia are similar statistically.

Table 7. Two Sample T-tests of Returns on Assets

Diff = Mean_ROA_SA - Mean_ROA_MA		t = 0.4824	Df= 154
HO: Diff =0	Ha: diff<0	Ha: diff! = 0	Ha: diff > 0
P-values	PR (T < t) = 0.6849	PR (|T| > |t|) = 0.6302	PR (T > t) = 0.3151

This table presents the two-sample t-test for equality of means of returns on assets for the sample of banks in both countries**.**

Table 8 below confirmed that not only are the non-performing loans of South African banks economically significantly larger than those of the Malaysian banks but even statistically the non-performing loans of South Africa are larger than that of Malaysia. The null hypothesis of South African banks' non-performing loans equal to that of Malaysian banks is rejected at the 95 percent confidence interval. Hence South African bank just like in the summary statistics has larger non-performing loans than Malaysian banks.

Table 8. Two Sample T-tests of Non-Performing Loans

Diff = Mean_NPL_SA - Mean_NPL_MA		t = 9.1665	Df= 154
HO: Diff =0	Ha: diff<0	Ha: diff! = 0	Ha: diff > 0
P-values	PR (T < t) = 1.0000	PR (|T| > |t|) = 0.0000	PR(T > t) = 0.0000

This table presents the two-sample t-test for equality of means of non-performing loans for the sample of banks in both countries.

4.4. Correlational Analysis

In this section, a correlational analysis of the relationship between the variables is employed for both countries. From the correlation table 9 below, non-performing loans and returns on assets have a positive but very weak and insignificant relationship between the two variables. This shows that non-performing loans and returns on assets do not have a strong association with South African banks. Capital

Table 9. Correlation Table South Africa

Variable	**ROA**	**CAR**	**BS**	**GDP**	**NPL**
ROA	1.0000				
CAR	-0.0089	1.0000			
BS	0.3863	-0.4872	1.0000		
GDP	-0.0496	0.0559	0.0120	1.0000	
NPL	0.1353	0.3353	-0.1138	0.1189	1.0000

This table presents the correlation between the variables associated with the sampled South African banks.

adequacy ratio and GDP have a negative and weak relationship with returns on assets as the correlation coefficient is closer to zero. However, bank size has a relatively stronger positive relationship with returns on assets compared to the other variables. These stronger relationships are confirmed in the regression analysis below, which reveals that bank size is the main determinant of returns on banks' assets in South Africa.

Table 10. Correlation Table Malaysia

Variable	**ROA**	**CAR**	**BS**	**GDP**	**NPL**
ROA	1.0000				
CAR	-0.1239	1.0000			
BS	-0.0550	0.0501	1.0000		
GDP	-0.3169	-0.1314	-0.0198	1.0000	

NPL	-0.3350	-0.2430	0.3038	0.0493	1.0000

This table presents the correlation between the variables associated with the sampled Malaysian banks.

From table 10 above, returns on assets and non-performing loans have a stronger and negative correlation between the two variables. This is the idle relationship every profit-seeking bank desire, lower non-performing loans mean that not only is the majority of the interest attached to those loans being received but also the bulk of the principals on those loans are also received for most Malaysian banks. Capital adequacy and bank size have a negative and relatively weaker correlation with returns on assets; however, GDP has a stronger negative association with returns on assets for Malaysian banks.

4.5. Breusch-Pagan Test for Heteroskedasticity

Table 11. Correlation Matrix of Residuals

__e1	**__e2**	**__e3**	**__e4**	**__e5**	**__e6**
__e1 **1.0000**					
__e2 **0.1612**	1.0000				
__e3 **-0.0360**	0.0132	1.0000			
__e4 **0.1100**	0.1315	0.0702	1.0000		
__e5 **-0.0121**	-0.0641	0.0758	-0.0100	1.0000	
__e6 **0.0492**	0.0821	0.1453	0.0642	-0.0479	1.0000

Breusch-Pagan LM test of independence: chi2(15) = 10.143, Pr = 0.1114

Based on 13 complete observations over panel units with a probability value of 0.1114, the null hypothesis of no heteroskedastic is not rejected. Thus, there is no heteroskedastic problem in the model.

4.6. Regression Analysis

Table 12 below provides the regression analysis results of the relationship between bank performance and non-performing loans for both countries. The dependent variable returns on assets

(ROA). The independent variables used for the regressions were non-performing loans, bank size, capital adequacy ratio, and GDP. Model 1 and model 2 are regression models for South African Banks while model 1 represents the simple regression of returns on assets and non-performing loans, and in model 2 bank size, capital adequacy ratio, and GDP are added to the model. The same models are estimated for Malaysian banks as well, wherein model 3 involves only returns on assets and non-performing loans, while in model 4 just like in model 2 bank size, capital adequacy ratio, and GDP were added to the model. The standard errors are presented in parentheses under each coefficient. The level of significance adopted in the analysis is as follows; *P < 0.1 represents a 10% level of significance ** P < 0.05 represents a 5% level of significance and *** P < 0.01 represents a 1% level of significance

Table 12. Regression Results

	(1)	(2)	(3)	(4)
VARIABLES	**ROA_SA**	**ROA_SA**	**ROA_MA**	**ROA_MA**
NPL	0.00985	0.0100	-0.00773***	-0.00940***
	(0.00827)	(0.00808)	(0.00249)	(0.00252)
CAR		0.0216		-0.0276**
		(0.0142)		(0.0107)
BS		0.641***		0.0182
		(0.154)		(0.0254)
GDP		-1.531		-0.0446***
		(1.942)		(0.0136)
Constant	0.719*	0.623	1.227***	1.691***
	(0.370)	(5.020)	(0.0613)	(0.217)
Observations	78	78	78	78
R-squared	0.018	0.213	0.112	0.271

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

In both the two regression models for South African banks, non-performing loans have a positive effect on returns on assets, this result contradicts the findings of (Kirui, 2014), Kingu et al. (2018) and Martiningtiyas & Nitinegeri (2020) but is consisted with the findings of (Madugu et al., 2020b), (Afriyie, 2013) and (Boahene et al., 2012). This is not what we expect before the estimation of the models because the more the loans of banks

become delinquent the fewer returns banks collect on the loans they issued. However, non-performing loans are not both statistically and economically significant in both models for South African banks. This result reveals that non-performing loans are not one of the factors that influence the returns on assets of South African banks. Indeed, we attribute this positive and significant relationship between credit risk and profitability to the prohibitive lending rates that the banks charge. Similarly, the Capital adequacy ratio has a positive but insignificant relationship with returns on assets for South African banks, this result is in line with Martiningtiyas & Nitinegeri (2020) which proves that there is no influence between the capital adequacy ratio to profitability, which means the size of the capital adequacy ratio of a bank cannot contribute to increasing bank profitability. However, GDP has a negative effect on returns on assets but it is also not statistically significant. The result is in line with Kingu et al. (2018) indicating that GDP does not have explanatory power over bank profitability levels. A possible explanation for this is that an increase in economic activities is associated with a low rate of defaults. Bank size has a positive and statistically significant relationship with returns on assets of South African banks which is in line with(Aliu & Çollaku, 2021). Thus, according to the regression models on South African banks, bank size is the main determinant of returns on assets of banks in South Africa.

In model 3 and model 4 unlike in the South African models, non-performing loans have a negative and statistically significant effect on returns on assets of Malaysian Banks. This is what we expect before the estimation of the models. This indicates that the lower the ROA, the larger the level of non-performing loans. Customer default on interest and principal payments affects both the balance sheet and the income statement, which could explain this relationship. Failure of customers to repay principal amounts affects banks' asset base, and the principal amount is written off as an expenditure on the income statement, reducing bank profit. Similarly, failure by customers to pay interest on loans as agreed affects bank income, lowering profitability. The results are consistent with the literature and empirical results that support the negative effect of NPL on the ROA and banks' profitability (Aliu & Çollaku, 2021),(Kirui, 2014),(Berger & DeYoung, 1997),(Do et al., 2020) and (Martiningtiyas & Nitinegeri, 2020). Similarly, the capital adequacy ratio and GDP have a negative impact on returns on assets and the relationships are statistically significant in the

model, findings are consistent with (Stephen Kingu et al., 2018) and (Do et al., 2020). However, bank size has a positive impact on returns on assets but it is not statistically significant.

The results show that bank size is the main determinant of returns on assets as a proxy for banks' performance in the South African banking industry. The study found that non-performing loans are not one of the factors that impact the returns on assets of banks in South Africa. For Malaysian banks, non-performing loans are one of the main determinants of returns on assets as a proxy for bank performance in Malaysia. Furthermore, unlike the South African Banking industry, capital adequacy ratio and gross domestic product are key determinants of returns on assets of banks in Malaysia. However, bank size is not an important determinant of bank performance proxied by returns on assets in Malaysia.

CONCLUSION

The purpose of the study was to examine how nonperforming loans affected the profitability of banks in Malaysia and South Africa. Discussions of the major findings, conclusions, recommendations, and suggestions for future studies are presented in this chapter.

The study looks at how non-performing loans affect the profitability of banks in South Africa and Malaysia. Non-performing loans and profitability in the context of banks in Malaysia and South Africa are the two main ideas in the study. Return on Assets (ROA) is a metric for profitability, and the non-performing loans ratio is a metric for non-performing loans. Control variables were thought to be additional profitability-influencing variables. The control variables taken into account are GDP, bank size, and capital adequacy ratio. This study used a descriptive design to carry out its objectives. The Population of the study comprised the entire 12 Banks, 6 for Malaysia and 6 for South Africa that have been licensed by the Central Bank of the two countries respectively. The secondary data used in this analysis spanned the years 2008 through 2020, a period of 13 years. We employed panel data methodologies to examine the determinants of bank profitability in this study. There is no unit root for the variables in both countries. We discovered that an increase in non-performing loans is related to a decrease in ROA for Malaysia. These findings are usually related to an increase in operating costs and a decline in profitability due to credit risk as measured by NPLs. The study found that the non-performing loans ratio measured by non-performing loans over total loans and advances is a suitable and important way to describe how non-performing loans affect the profitability of banks in Malaysia. Interestingly for South Africa, the results show that non-performing loans have a positive relationship with profitability, in a practical sense this is not what we expected in a normal bank operational setting. We expect lower profits as the number of non-performing loans increases. Thus, the rather higher lending rates may explain the positive effect. When banks charge reasonable interest rate on their customers,' loan portfolio performances tend to improve hence increasing lender returns. Theoretically, NPLs to total assets reduces profitability. However, where NPLs to total assets proportionally spurs profitability this may suggest that the lenders pass the cost of loan default to other customers in the form of

higher interest rate on loan facilities. Bank size is the main determinant of profitability for South African banks. The macroeconomic variable GDP has a negative effect on profitability for both countries. This study's findings have several consequences for researchers, practitioners, and regulators.

RECOMMENDATIONS

It would be reasonable to make the following suggestions in light of the analysis, discussion, and study findings presented above; bank management should thoroughly evaluate client data and information throughout to eliminate any possible information asymmetry in the credit analysis stage. Management must also invest in comprehensive credit information systems to close information gaps and provide access to thorough, accurate, and reliable information about borrowers. Besides, bank management must use cost-cutting strategies when controlling their loan portfolio. Additionally, Regulators must keep a careful eye on bank operational efficiency ratios and capital adequacy by paying closer monitoring to cost-to-income ratio changes and the capital position of the bank. Regulators should create legislation and surveillance mechanisms that will alert regulators to prospective bank failures due to the accumulation of bad debt.

SUGGESTIONS FOR FUTURE STUDIES

The agenda for future studies will be relevant to investigating the effect of NPL's lending behaviors on banks by considering bank size and market growth rate as endogenous variables. concerning different types of NPL by considering their bank size and market growth levels. Additionally, bank interest rate swings could be considered by future researchers. Future research could expand this scope to include other parameters that are used to measure profitability and non-performing Loans of banks in Malaysia and South Africa. The effect of non-performing loans on the profitability of banks in South Africa should be examined to see whether the nonperforming loans will produce the same results as this study. To determine whether the same results would be obtained, the study on the impact of non-performing loans on profitability should also be conducted on other financial institutions, such as Micro Finance Institution

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APPENDICES

Table 1: UNIT ROOT TEST FOR SOUTH AFRICA

Augmented dickey fuller test at (lag 2)	variables	Integrated order	p-values	conclusions
	ROA	0	0.0462	No unit root
	NPL	0	0.0020	No unit root
	CAR	0	0.0149	No unit root
	BS	0	0.0343	No unit root
	GDP	0	0.0000	No unit root

Table 2: UNIT ROOT TEST FOR MALAYSIA

Augmented dickey fuller test at (lag 2)	variables	Integrated order	p-values	conclusions
	ROA	0	0.0481	No unit root
	NPL	0	0.0117	No unit root
	CAR	0	0.0001	No unit root
	BS	0	0.0159	No unit root
	GDP	0	0.0000	No unit root

Table 3: Evolution of Bank NPLs in Asia

(% of gross loans)

Economy	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Central Asia																							
Afghanistan														49.9	4.7	5.0	4.9	7.8	12.1	11.1	12.2	8.9	
Armenia		6.0	8.0	17.5	24.4	9.9	5.4	2.1	2.0	2.4	2.4	4.3	4.9	3.0	3.4	3.7	4.5	7.0	8.0	6.7	5.4	4.8	5.1
Azerbaijan						28.0	21.5	15.1	9.5	7.2				3.5	4.7	6.0	5.7	4.5	4.4	5.3	13.8	12.2	
Kazakhstan						11.9	8.4	4.3	3.3	2.4	2.7	7.1	18.9	20.9	20.7	19.4	19.5	12.4	8.0	6.7	9.3	7.4	8.1
Kyrgyz Republic		10.1	30.9	30.9	13.4	13.3	11.2	8.0		6.2	3.6	5.3	8.2	14.8	9.4	6.6	5.1	4.2	6.7	8.5	7.4	7.3	7.7
Tajikistan				5.2	3.0	5.1	5.2	3.6	3.3	1.1	0.7	2.3	44.3	7.6	6.8	6.4	8.6	11.6	17.2	26.6	21.6	21.2	
East Asia																							
Korea, Rep of.					2.8	1.9	2.0	1.6	1.0	0.7	0.6	0.9	0.8	1.1	0.9	1.0	1.2	1.0	1.0	1.1	0.9	0.7	0.6
Mongolia		19.7	31.0	50.5	21.9	6.7	5.1	4.8	6.4	5.8	4.9	3.3	7.2	17.4	11.5	5.8	4.2	5.3	7.4	8.5	8.5	10.4	10.1
PRC				28.5	22.4	29.8	26.0	20.4	13.2	8.6	7.1	6.2	2.4	1.6	1.1	1.0	1.0	1.2	1.0	1.7	1.7	1.7	1.8	1.9

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Economy	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
South Asia																							
Bangladesh		40.7	41.1	34.9	31.5	28.1	22.1	17.5	13.2	12.8	14.5				5.8	9.7	8.6	9.4	8.4	8.9	8.9	9.9	8.9
India	14.4	14.7	12.8	11.5	10.4	9.1	7.2	4.9	3.3	2.5	2.3	2.5	2.3	2.2	2.7	3.4	4.0	4.4	5.9	9.2	10.0	9.5	9.2
Maldives																20.9	17.6	17.5	14.1	10.6	10.5	8.9	9.4
Pakistan	24.0	23.0	26.0	24.0	23.0	22.0	17.0	12.0	9.0	7.3	7.4	9.1	12.2	14.8	16.2	14.5	13.0	12.3	11.4	10.1	8.4	8.0	8.6
Southeast Asia																							
Cambodia	7.2	16.2	14.5	12.4	8.4	14.8	13.9	10.3	7.8	9.9	3.4	3.7	4.8	3.1	2.3	2.2	2.3	1.6	1.6	2.1	2.1	2.0	1.6
Indonesia		48.6	32.9	34.4	31.9	24.0	6.8	4.5	7.3	5.9	4.0	3.2	3.3	2.5	2.1	1.8	1.7	2.1	2.4	2.9	2.6	2.3	2.4
Malaysia	4.1	18.6	16.6	15.4	17.8	15.9	13.9	11.7	9.4	8.5	6.5	4.8	3.6	3.4	2.7	2.0	1.9	1.7	1.6	1.6	1.6	1.5	1.5
Philippines	4.7	12.4	14.6	24.0	27.7	14.6	16.1	14.4	10.0	7.5	5.8	4.6	3.5	3.4	2.6	2.2	2.4	2.0	1.9	1.7	1.6	1.7	2.0
Thailand		42.9	38.6	17.7	11.5	16.5	13.5	11.9	9.1	7.8	7.6	5.6	5.2	3.9	2.9	2.4	2.3	2.3	2.7	3.0	3.1	3.1	3.1

NPL = nonperforming loan, PRC = People's Republic of China.
Note: White cells denote nonperforming ratios less than 5%, yellow between 5% and 10%, and orange higher than 10%. Blank cells mean data are not available.