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DETERMINANTS OF BANKS' PROFITABILITY: A COMPARATIVE ANALYSIS BETWEEN MALAYSIA AND SOUTH AFRICA[1]

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ABSTRACT

The profitability of banks has been an important subject and a major concern for investors, researchers, and regulatory bodies. This study aims to determine the factors that affect the profitability of banks in Malaysia and South Africa, utilizing data from the Thomson Reuters database, the world bank database, and financial statements of selected banks between 2008 to 2020. Besides, by employing a multiple regression analysis, bank size and non-performing loans were found to exert positive and significant effects on South African Bank's 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 study draws practical and managerial implications relevant to the operational efficiency of banks in both countries.

Keywords: Nonperforming loans, Profitability (ROA), Capital Adequacy Ratio, Malaysia, South Africa

ÖZET

Banka karlılığı yatırımcılar, araştırmacılar ve düzenleyici kuruluşlar için hem önemli bir konu hem de kaygı kaynağı olmuştur. Bu çalışmada, Malezya ve Güney Arfika Cumhuriyetindeki bankaların karlılığının üzerindeki etmenlerin belirlenmesi amaçlanmıştır. Thompson Reuters veri tabanı, Dünya Bankası veri tabanı ve 2008-2020 yılları arasında seçilen bankaların finansal tabloları kullanılarak analizler yapılmıştır. Bu çalışmada kullanılan çoklu regresyon analizi banka büyüklüğü ve sorunlu kredilerin Güney Afrika Cumhuriyeti bankacılığının karlılığı üzerinde pozitif ve istatistiksel olarak anlamlı bir etkisi vardır. Malezya için ise, sorunlu krediler, gayrisafi yurtiçi hasıla ve CAR bağımsız değişkenlerinin bankaların aktif karlılığı üzerinde negative etkisinin bulunduğu tespit edilmiştir. Panel veri analizi sonuçları sermaye yeterlilik oranı ile banka büyüklüğü arasında anlamlı ve pozitif bir ilişkiye işaret etmekte ve banka büyüklüğü ve karlılık arasında istatistiksel olarak anlamlı ve negative yönlü bir ilişki söz konusudur. Bu çalışma her iki ülke için de bankaların operasyonel verimliliği hakkında önemli çıkarımlar ortaya koymuştur.

Anahtar kelimeler: Sorunlu Krediler, Aktif Karlılık, Sermaye Yeterlilik Oranı, Malezya, Güney Afrika Cumhuriyeti

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1. 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 is 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). When a debtor fails to pay the principal or interest for 90 days or more, the account becomes non-performing (Ramli & Nuruddin, 2020). 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, who will eventually go bankrupt (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 (Yurttadur et al., 2019).

Besides, while the big banks have been making a lot of money, some smaller banks have not been able to fulfill their profit targets for the year. The average NPL as a proportion of gross income between 2008 and 2017 was 4.01 percent. During this time, the maximum NPL as a proportion of gross income was 6.0 percent. The rate at which performance is deteriorating could be linked to the burden of NPL on some of these banks (Lawrence et al., 2020). Despite recent 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. Similarly, 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. Furthermore, if there is no chance of recovering their bad loans, the bank's productivity will be jeopardized, and they will be unable to obtain the loan repaid in full.

Nevertheless, some recent studies on Nonperforming loans and profitability include Efficiency measurement of the banking sector in the presence of nonperforming loans (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 determinants of a bank's profitability, 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 investigated the determinants of a bank's profitability, comparing Malaysia and South Africa. Hence the study employs multiple regression techniques in estimating the model of the study. In addition, the study used secondary data from the Thomson Reuters database, world bank database, and annual reports of selected banks between the year 2008 to 2020. The study also used STATA to run data analysis.

2. LITERATURE REVIEW

As observed in the extant literature, non-performing loans and banks' operational efficiency has sparkled 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

2.1.1. Modern Portfolio Theory

One of the most significant and efficient economic theories relating to finance and investment is the modern portfolio theory (MPT)(Markowitz, 1952). The Modern Portfolio Theory (MPT) refers to an investment theory that permits investors to assemble an asset portfolio that maximizes expected return for a given level of risk. More so, the benefits of diversity, also known as "not putting all eggs in one basket," are measured by modern portfolio theory. Modern portfolio theory (MPT) is an investment theory that tries to elucidate how investors could maximize their returns and minimize their risks by diversifying several assets. (Tobin, 1958) expanded the theory of Markowitz's (portfolio theory) by adding the analysis of risk-free assets making it possible to influence portfolios on the efficient frontier. Given predictions of future returns and a suitable covariance matrix of share returns, (Markowitz, 1952) and (Tobin, 1958) demonstrated that it was possible to identify the composition of an efficient portfolio of risky securities.

Further, the portfolio theory technique plays a significant role in the studies of bank performance and is the most important technique when it involves examining bank performance (Tabi Atemnkeng & Nzongang, 2010). According to the Portfolio Balance Model of Asset Diversification, the optimal holding of each asset in a wealth holder's portfolio depends on policy choices influenced by a number of variables, such as the vector of rates of return on all assets held within the portfolio, a vector of risks associated with the ownership of each financial asset, and consequently the size of the portfolio. Additionally, as previously said, actions made by banks' management are precursors to portfolio diversification and the desired portfolio composition of commercial banks (ibid). Besides, the ability to obtain maximum profits depends on the achievable set of assets and liabilities determined by the management as well as the unit expenses incurred by the bank for producing each component of assets, (Tabi Atemnkeng & Nzongang, 2010).

Thus, to reduce the risk of borrowers' defaults on their loans, commercial banks should give some thought to diversifying their investment portfolios creating ease portfolios of non-performing loans that have a negative impact on profitability. The notion of portfolio theory holds that people can lower firm-specific risk by following portfolios, which is the foundation for the concept of revenue diversifications. Further, this should be in accordance with the following activity or product diversification which is based on the notion of diversification providing a stable and less volatile income, economies of, scope and scale. Additionally, the ability to leverage managerial efficiency across products, and within the case of commercial banks, a decrease in non-performing loans and an increase in Return on Assets, which is employed as a measure of profitability.

2.2. Empirical review

2.2.1. Non-Performing loans and Banks' 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 sustainability of a banking company. It is crucial to examine NPL because it reveals the credit worthiness 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).

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. Moreover (Berger & DeYoung, 1997) investigated the intersection between the problem loan literature and the bank efficiency literature using Granger-causality approaches. They claim that med, poor management in financial institutions causes low-quality loans, which ultimately cause an increased quantity of bad loans, or so-called nonperforming loans, which have a negative effect on the profitability of the banks.

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. Some of the control elements include the liquidity ratio, capital adequacy ratio, gross domestic product, and size. Purposive sampling was used to choose 26 conventional banks that were listed on the Indonesian Stock Exchange between 2009 and 2017 and 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 significant positive impact on bank profitability; however, the capital adequacy ratio has little impact on bank profitability.

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. Similarly, the same result was produced when (Do et al., 2020) Researched the effect of non-performing loans on commercial banks: In the case of Vietnam, he constructs the test with panel data using the fixed and random effects model, as well as the practical general least squares method. 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.

2.2.2. Banks' Capital Adequacy Ratio Financial Indices

However (Martiningtiyas & Nitinegeri, 2020) explain the capital adequacy ratio as a statistic used to evaluate a bank's capital capacity 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.

However (Ajayi et al., 2019) analyzed the impact of the capital adequacy ratio (CAR) on the profitability of Deposit Money Banks (DMBs), using the Return on Assets (ROA) as a profitability metric from their 2017 annual report. The OLS method was used to analyze the research's data in SPSS 20.0. The findings show a significant positive relationship between the capital adequacy ratio (CAR) and profitability (ROA) of Deposit Money Banks (DMB)'S in Nigeria and recommend banks' regulators to give attention to strategic monitoring and evaluation in addition to capital adequacy to sustain the financial stability and strength of Nigerian banks.

Similarly (Ogboi and Unuafe 2013) investigated the effects of credit risk management and capital sufficiency on banks' financial performance in Nigeria using cross-sectional and time series data from selected banks' annual reports and accounts from 2004 to 2009. This is done in order to give additional empirical data on the effects of capital adequacy and credit risk management practices on bank profitability in Nigeria. A panel data model was used to evaluate the relationship between loan loss provisions (LLP), loans and advances (LA), non-performing loans (NPL), capital adequacy (CA), and return on asset (ROA). The results showed that, with the exception of loans and advances, which were shown to significantly affect banks' profitability during the year, strong credit risk management and capital adequacy have a beneficial impact on a bank's financial performance. It is advised that Nigerian

banks establish effective credit risk management strategies by conducting comprehensive credit analysis before loan issue and withdrawal in light of the findings. It is also suggested that Nigerian banks' Tier-One capital receive the proper attention.

More so (Olalekan & Adeyinka, 2013) has investigated how capital adequacy impacts the profitability of deposit-taking banks in Nigeria's banking sector, including both domestic and foreign banks. The study presents primary data obtained from surveys given to bank employees, with a sample size of 518 and a response rate of 76%. Also, banks published financial statements from 2006 to 2010 were used. It was found that the profitability of Nigerian banks is positively correlated with capital adequacy. The primary data analysis showed no relationship at all; however, the secondary data analysis showed a significant association. The results imply that capital adequacy is an important factor in determining profitability for deposit-taking banks in Nigeria. They recommend the regulatory authority make sure that the benefits of the banking reform procedures are maintained, and the CBN should take more immediate action to strengthen the Nigerian banking sector's risk management framework since this will improve its profitability.

2.2.3. Bank Size and Profitability

In the majority of finance literature, banks' total asset size is used as a proxy for banks' size. The size of a bank is determined by using the natural logarithm of its total assets (log A). Most of the time, it is anticipated that the effect of bank size on profitability will be positive(Rahman et al., 2015).

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, which can be supported by a number of factors. The high initial costs for this institution, such as the pricey computer mainframes and the software costs that reduce profitability rates, could be one of the factors contributing to the reduction in big banks' profitability. In contrast to small and medium-sized banks, large banks find it challenging to invest their substantial liquidity. (Aladwan, 2015).

However (Aladwan, 2015) investigated the impact of bank size on profitability in" An 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 means of ROE for the three chosen groups were analyzed using a two-sample t-test. The findings demonstrate that the means of the samples differ statistically from one another. The data also shows that profitability rises with decreasing asset size. The findings of the regression analysis also showed a substantial negative association between profitability and asset size.

Nonetheless (Parvin et al., 2019) performed analysis on the impact of bank size and liquidity on Bangladeshi commercial banks' profitability. The study's findings were determined using statistics. The study's conclusions show that the banks' profitability indicator ratio (ROA) was positively affected by the loan to assets ratio (LA). It was observed that the larger the bank size the greater the return on assets of the banks. The deposit to assets ratio (DA), on the other hand, has a negative effect on profitability. Overall, the correlation data showed that neither bank size nor liquidity significantly impacted the profitability of banks.

As discussed by (Anbar et al., 2011);(Rahman et al., 2015) macroeconomic and bank-specific factors affecting commercial bank profitability in Turkey between 2002 and 2010. The findings demonstrate that asset size significantly and positively impacts profitability. The study contends that larger banks have greater ROA and ROE, ad that the economies of scale hypothesis are supported by the positive coefficients of asset size variables. Profitability is negatively influenced by the ratio of loans, assets, and loans under follow-up (ROA). The ratio of non-interest income to assets has a favorable and considerable impact on ROA. Profitability (ROE) is only proven to be positively impacted by real interest rates. The other bank-specific factors—capital adequacy, liquidity, the ratio of deposits to assets, and net interest margin—have no significant impact on bank profitability.

However (Rohman et al., 2022) looked into the determinants of the profitability of 43 banks in Indonesia before and after the COVID-19 epidemic, utilizing return on assets (ROA), return on equity (ROE), and net interest margin (NIM) as profitability indicators. According to the regression analysis's findings, banks were less profitable during the pandemic than they were before it. Other evidence shows that the capital adequacy ratio (CAR) and non-performing loans (NPL) have a negative impact on profitability both before and after the pandemic. However, bank size (BS) and liquidity have little impact on the profitability of Indonesian banking (ROA, ROE, and NIM). The study suggested that the Indonesian government, through the financial service authority (OJK) and bank Indonesia, adopt regulations that will motivate banks to perform better.

As (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.

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 study's findings suggested that the size of the bank, the capital adequacy ratio, and third-party have a positive and significant impact on profitability. Meanwhile, the loan-to-deposit ratio has a positive but insignificant impact on the banking companies' profitability on the Indonesian stock exchange between 2016 and 2018. According to the report, banks should increase lending while maintaining the given loan interest rate in order to boost business earnings.

2.2.4. Gross Domestic Product (GDP) and Banks' Financial Performance

Gross domestic products (GDP) are a macroeconomic indicator that measures a country's entire economic activities. The impact of GDP growth on bank profitability is expected to be positive (Rahman et al., 2015). However (Martiningtiyas & Nitinegeri, 2020) Discuss GDP as a metric for calculating total community income and total expenditure on products and services produced in a country's economy. Annual GDP growth rates can be used to calculate and get GDP.

Furthermore (Liu & Wilson, 2010) examines the profitability of banks in japan for a sample of banks with various ownership forms (city, trust, regional, second association regional, shrinking, and other credit cooperation). They came to the conclusion that the effect of real GDP growth on bank profitability varied depending on the form of ownership, but there was some evidence that GDP growth would increase competition, which would reduce bank profit. There is evidence that the growth of the stock market has a negative effect on the profitability of Japanese banks, but the city and trust banks are exempt from this relationship. Additionally, they discover proof that banks with adequate capital and efficiency with lower credit risk perform better than their counterparts with insufficient capital and inefficiency with higher credit risk. The findings imply that policies that encourage banks to increase their capital levels, diversify their revenue sources, and reduce their costs in relation to income could result in large welfare gains for the Japanese banking sector.

Similarly (Tan & Floros, 2012) researched bank profitability and GDP growth in China: a note. Using the period of 2003-2009. According to the empirical results, cost-effectiveness and bank profitability are positively correlated. While greater taxes paid by banks might also account for lower profitability. Furthermore, there is a negative relationship between bank profitability and GDP growth. Additionally,

their research shows that (1) the amount of non-performing loans has a major impact on the profitability of the Chinese banking sector, and (2) Chinese banks with higher capital levels are less profitable. They demonstrate that higher GDP growth reduces bank profitability in China and advise that overhead costs be better managed to boost efficiency (bank efficiency has a positive impact on bank profitability).

Likewise (Yüksel et al., 2018) examined the determinants of profitability in the banking sector: an analysis of post-soviet countries utilizing yearly data from 1996 to 2016 and fixed effects panel regression and the generalized method of moments (GMM) were used to analyze the data. They came to the conclusion that higher GDP comes with higher bank profitability for post-soviet countries. Lastly, the loan to GDP ratio and bank profitability in post-soviet countries are negatively correlated. They advise banks in post-soviet countries to concentrate on strategies for raising their non-interest income. Furthermore, it is crucial for banks to exercise caution and risk aversion while making loans to their clients.

To the contrary (Ebenezer et al, 2017) examined macroeconomic and bank-specific determinants of commercial bank profitability: empirical evidence from Nigeria. The empirical findings of the study demonstrate that capital adequacy and liquidity have a positive and significant impact on bank profitability using the balanced panel data set. However, there is a strong and negative correlation between the efficiency ratio and profitability. Regarding the macroeconomic factor, GDP growth also has a positive and significant effect on the profitability of banks. The empirical findings of the study revealed that banks can increase their profitability by boosting capital and liquidity, lowering operating expenses, and making deliberate efforts to keep their business operations transparent.

3. METHODOLOGY

In this chapter, the empirical methodology employed to study the impact of Non-Performing Loans on banks' profitability is presented. The objective of the research is to examine the determinants of banks' profitability in South Africa and Malaysia. Similar to those (Kingu, 2018) and (Martiningtiyas and Nitinegeri, 2020) this study adopted the multiple regression analysis with the Variance-covariance matrix of the estimators, vice (Robust) methodology.

3.1. Data

A sample design is a clear strategy that aids in obtaining a sample from a specified population prior to the collection of any data (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 time frame was chosen due to the availability of data and to reasonably encompass the period of the various banking sector reforms. secondary sources of data are favored, Because secondary data are those that are already available, that is, data that have previously been gathered and examined by someone else (Panta & Alshebami, 2018). The study gathered data made 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. The world bank's database is used to extract data on GDP. Data were 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 f the variables under inquiry is described using descriptive statistics such as mean, standard deviation, minimum, and maximum values.

3.2. The Regression Model:

$$ROA_{it} = \alpha + \beta NPL_{it} + \gamma_2 CAR_{it} + \gamma_3 BS_{it} + \gamma_4 GDPGR_{it} + \varepsilon$$

ROA_{it}= Return on Asset of bank i in year t, with t from 2008 to 2020.
α = Constant
$\beta 1$ = Coeff of Non-performing Loans
$\gamma 2$ = Coeff of Capital Adequacy Ratio
$\gamma 3$ = Coeff of Bank Size

γ4 = Coeff of Gross Domestic Product
NPL = Non-performing Loans
CAR = Capital Adequacy Ratio
BS = Bank Size
GDPGR = Growth rate of Gross Domestic Product per capita. This is a country level variable, therefore for each year, it is the same for all banks in the country concern. The difference is mainly between countries.
ε = Residual (Error)

Estimation
The above model is estimated first assuming a zero-conditional mean of ε, indicating that all the relevant cofactors are included, and the NPL, CAR, BS and GDPGR are all exogenous. We estimate in table 5, the model assuming a structural difference, i.e. to say, our parameters are difference for South Africa and Malaysia. In Table 6, we further explore the panel structure of data and test for the presence of country and bank fixed effects. The pooled model is a the same as the separate models 2 and 4 in Table 5, where we assumed there is no difference in the effects of NPL, CAR, BS and GDPGR on ROA in South Africa and Malaysia. A comparison of the three models in Table 6, suggests a preference of the Fixed effect model over the Random effect.

3.3. 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.

Table 1. Measurement of the Variables

Variables	Definition	Year	Adopted from
Dependent variable			
Return on asset	Net profit / Total Assets	2008-2020	(Do et al., 2020)
Independent variable			
Non-performing loan	Total Non-performing Loans / Total Loans	2008-2020	(Stephen Kingu et al., 2018)
Capital adequacy ratio	Equity / Total Assets	2008-2020	(Kirui, 2014)
Bank size	Total Asset	2008-2020	(Martiningtiyas & Nitinegeri, 2020)
Gross Domestic Product	Year–on–Year GDP Growth Rate	2008-2020	(Martiningtiyas & Nitinegeri, 2020)

4. EMPIRICAL FINDINGS

This chapter presents data analysis, results, and discussion made from the study on the determinants of banks' profitability in Malaysia and South Africa.

From Table 2 and Table 3 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 2. 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 description of the variables associated with the Six South African Banks.

loans compared to the 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) relatively 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). This riskier loan portfolio may lead to non-performing loans. This could explain the reason why South Africa has the highest non-performing loans.

Table 3. 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 description of the variables associated with the Six Malaysian Banks

4.1. Pesaran's Test of Cross-Sectional Independence

Null hypothesis: A standard assumption in panel data models (xTreg) is that the error terms are independent across cross-sections.

Pesaran's test of cross-sectional independence = 1.241, Pr = 0.2147

The average absolute value of the off-diagonal elements = 0.338

With a probability value of 0.2147, the null hypothesis of cross-sectional independence is not rejected. Thus, there is cross-sectional independence in the model.

4.2. Breusch-Pagan Test for Heteroskedasticity

The null hypothesis for this test is that the residual matrix is an identity matrix, thus estimating the model assuming independence of the errors. Thus, failure to reject the null implies no heteroskedastic.

Table 4. 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.

4.3. Regression Analysis

Table 5 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 regressions 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 5% level of significance and *** P < 0.01 represents 1% level of significance.

Table 5: Regression Results

VARIABLES	(1) ROA_SA	(2) ROA_SA	(3) ROA_MA	(4) 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 is not in line with (Kirui, 2014),(Stephen Kingu et al., 2018), and (Martiningtiyas & Nitinegeri, 2020). 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. 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) It demonstrates that there is no relationship between capital adequacy and profitability, indicating that a bank's capital adequacy ratio cannot contribute to boosting profitability. However, gross domestic products have a negative effect on returns on assets, but it is also not statistically significant. The result is in line with (Stephen Kingu et al., 2018) revealing that bank profitability levels are not explained by GDP. This could be explained by the fact that rising economic activity is linked to a low default rate. 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 be the reason for this relationship. A customer's failure to make principal payments have an impact on the bank's asset base since the principal amount is written off as an expense on the income statement, which lowers bank profit. Similarly, failure by customers to pay interest on loans as agreed affects bank income, lowering profitability. The findings are in line with the body of literature and empirical findings that demonstrate the negative impact of NPLs on bank profitability(ROA). (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 those (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 bank 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.

Table 6: 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

In table 6, present combine pooled regression, a random effect, and a fixed effect model with the same sample of banks in Malaysia and South Africa. The Hausman test for difference in parameters between the fixed and random effect model have 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 capital adequacy ratio is positive and significant the results indicate that a rise in capital adequacy ratio has the ability to explain a rise in bank profits. The fact that banks with greater capital ratios rely on their own 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 is in line with (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. These finding is supported by (Aladwan, 2015).

5. CONCLUSION

We employed panel data methodologies to examine the determinants of bank profitability in this study. 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. Interestingly for South Africa the results show that non-performing loans have a positive relationship with profitability, on 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. Bank size is the main determinant of profitability for South African banks. This study's findings have several consequences for researchers, practitioners, and regulators.

Hence, as practical implications, 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.

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. Thus, the agenda for future studies will be relevant to investigating the effects of NPLs lending behaviors of banks by considering bank size and market growth rate as endogenous variables. concerning different types of NPL as well as bank size and market growth levels. Additionally, bank interest rate swings could be considered by future researchers.

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