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NON-PERFORMING LOANS AND FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN TANZANIA

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ABSTRACT

The purpose of this paper is to examine the relationship between non-performing loans and the performance of Tanzanian commercial banks. The study employed a longitudinal explanatory research design, using panel data of 41 commercial banks in Tanzania and macroeconomic data (2006 to 2019). Data were analyzed using fixed and random effect regression models and PLS-SEM. From the results, the study indicated NPLR had a negative and non-significant relationship with both Return on Equity (ROE) and Return on Asset (ROA). The annual GDP rate was observed to show a negative and significant effect on both ROA and ROE. Also, regarding its impact on ROA and ROE, inflation was found to have a positive but insignificant effect. The exchange rate impacted ROE and ROA positively and significantly. However, the interest rate was found to have an insignificant and negative relationship with ROA and ROE.The paper amongst others recommends that banks' management should improve their credit risk management practices together with establishing an early warning system to alert the banks in case of NPL accumulation so that they can take appropriate means to curb the problem. Commercial banks must apply the information asymmetry theory to choose less risky portfolios but also borrowers to reduce risks associated with the bank's operations.

Keyword: Non-Performing Loans, ROA, ROE, Bank Performance

1. INTRODUCTION

All commercial banks all over the world are facing the massive risks of non-performing loans which have led to the decline in the portfolio quality of the loans. The situation of non-performing loans is not only a challenge worldwide but also in Tanzania. In Tanzanian commercial banks, the Non-Performing Loans to Total Gross Loans data was reported at 12.441 percent in 2017. This record a 2.83% increase from the previous number of 9.608 percent for 2016, and then decreased to 10.4 percent in 2018 before reaching 9.8 percent in 2019. Between 2006-2016 years, the data reached an all-time high of 12.44 percent in 2017 and a record low of 5.115 percent in 2013. This trend shows commercial banks in Tanzania have remained with the persistent challenge of reducing non-performing loans that are considered to have effects on their performance.

Accordingly, to ensure that commercial banks maintain good quality assets and operate within prudential requirements, the Bank of Tanzania (BOT) has increased on-site and off-site monitoring and passed Credit reference Bureaus Regulation of 2012, Management of Risk

Assets Regulations of 2014 (MRAR), and Credit Concentration and Other Exposure Limits Regulations of 2014 (CCOL). Despite actions that have been taken by the BOT, nonperforming loans have generally increased and stand at a ratio bigger than the 5 percent limit required by the Bank of Tanzania as the supervisor. As a result of this persistent existence of NPL in the banking sector, the Bank of Tanzania (BoT) recommended minimum strategies and granted reliefs to assist in tackling the growing number of NPLs through the BoT Circular No. FA.178/461/01/02 dated 19 February 2018 titled "Measures to Increase Credit to Private Sector and Contain Non-Performing Loans" (the **Circular**).

The BOT has also relinquished certain provisions of the Banking and Financial Institutions (Management of Risk Assets) Regulations 2014 (the Banking MRA Regulations) to provide reliefs which hopefully aid the reduction of NPLs in the industry. Among others, BOT has now permitted banks to restructure NPLs up to 4 times from the previous limit of 2 times. Under this regulation, the BOT requires banks and financial institutions to play a larger role by identifying exactly why a borrower has failed to meet repayment deadlines, and the regulation only applies for borrowers whose businesses have been affected by external factors as opposed to their characters (Msinjili, Marandu, and Ayub, 2018). According to Ayub&Msinjili (2020), the impact of the Circular was evident as NPLs declined from 11.1 percent in April 2019 to 10.7 percent in June 2019 and 9.8 percent in December 2019. Although NPLs ratio declined to 9.8 percent from 12.44 percent in 2017 and 10.4 in 2018, it still above the desirable level of 5.0 percent, and therefore BoT continues to take measures to address the challenge.

According to BOT (2014), the NPL is a loan in which a borrower does not make any interest and principal payments for at least 90 days or classified as substandard or doubtful or loss. According to the International Monetary Fund (IMF, 2009), a non- performing loan is any loan in which interest and principal payments are more than 90 days overdue. Greuning and Bratonovic (2000) describe NPLs as those assets that are no longer generating income. As a result non-performing loans over a long period gradually affect liquidity and solvency of banks and may thus negatively affect the liquidity position of the financial sector (Gila-Gourgoura and Nikolaidou, 2017) and high loan provisioning, which leads to drop-in profits for many banks. NPL and gradually minimizes the bank sector's ability to play its role in the development of the economy. It is, therefore, imperative to scientifically examine and understand how NPL affects commercial bank's operations to the detrimental impact in Tanzania.

Theoretically, NPLR is a financial indicator that demonstrates the quality of bank loans and how commercial banks are exposed to the risk of default or late payment from loan borrowers. The core activity of commercial banks is to make loans. Banks make money from a series of activities of borrowing and deposit. NPL is considered as losses when happens. Higher NPLR means higher losses, which adversely influence the banks' available capital for further borrowing and investments. Similarly, Kingu et al. (2017) posit that increase in the level of gross non-performing loans pause a great risk to the financial sector and the economy at large. Hence, the efficiency of banks' investment is affected, further influencing negatively the profitability of commercial banks (Makri et al., 2014). On the contrary, lower NPLR is related to the lower risk and deposit rate, meaning a positive impact on banks' operations and profitability.

Non-performing loans as a measure of loan quality among financial institutions are often associated with failures and financial crises in both the developed and developing countries (Kaaya and Pastory, 2013). Non-performing loans are one of the main indicators to identify the

asset quality of the bank. The share of non-performing loans in total loans is one of the main indicators of credit risk, contributing to the deterioration of bank assets (Ozili, 2017; Gila-Gourgoura and Nikolaidou, 2017). A higher ratio represents a higher credit risk, as a result of increased non-performing loans. NPL not only reduces the bank's profit but also the capacity of lending by reducing bankable assets (Lelisa, 2014). Depositors and investors start losing faith in the bank as they feel unsecured of getting back their invested money with an expected return. That is why defining the influence of NPLs is crucial for both bank performance and the financial system as a whole.

2. STATEMENT OF THE PROBLEM

Tanzania being a developing country depends heavily on the banking industry for smooth financial intermediation which enhances investment and economic growth (Bashir, 2000). The banking sector plays a critical role in the development of the economy through effective and efficient lending. However, the Tanzanian commercial banking sector currently facing the acute problem of NPL as a sign of ineffective lending practices, and the problem increases although many reform measures have been carried out. The BOT reported a deterioration of the banking sector's asset quality which manifested itself in the rise of the NPL position. Gross non-performing loans in Tanzania have continued to grow gradually from 6.8 percent in 2006 to 12.44 in 2017 before dropped to 9.8 percent in 2019, which is still high above the threshold of 5 percent. Nonperforming loans are not only harmful to the financial performance of commercial banks, but they also have other serious negative impacts on the economic recovery and development of a country.

The critical nature of NPLs to the financial performance necessitated this current study which aimed at finding the effect of NPLs on the financial performance of commercial banks operating in Tanzania. This study intends to fill the research gap by taking into account other factors affecting the performance of commercial banks as control variables in the regression analysis. The study, therefore, seeks to answer the question; do non-performing Loans have effects on the performance of commercial banks in Tanzania.

Research Objectives

This study is guided by one major objective and two specific objectives.

General objectives

To evaluate the effect of non-performing loan on the financial performance of commercial banks in Tanzania

Specific objectives

i. To analyses the impact of NPL on the financial performance of commercial banks in Tanzania

ii. To analyses the impact of macroeconomic variables on the financial performance of commercial banks in Tanzania

3. LITERATURE REVIEW

The meaning of non-performing loan

A non-performing loan is calculated by dividing non-performing loans by total loans and advances. According to Kingu et al., (2018), there is no global standard to define non-performing

loans; however, variations exist in terms of classification and content. According to the International Monetary Fund (IMF, 2009), a non- performing loan is any loan in which interest and principal payments are more than 90 days overdue. Similarly, Kingu (2018) defined non-performing loans as loans whose principal and or interest remains unpaid for 90 days or more after the due date. Similarly, non-performing loans are loans that are past due for ninety days or more (Magali and Qoing, 2014) and are no longer generating interest income for the bank (Pastory et al., 2013). Also, BOT defines NPL as any credit accommodation in which contractualrepayment is ninety days or more past due, and has been classified as a substandard, doubtful, or loss account by a bank. This paper adopted the BOT definition of NPL.

Theoretical Review

This study is discussed on the premises of Information asymmetry theory, which is one of the tenants of the lemon theory propounded by Akerlof in 1970. Also, another theoretical perspective that informed this research and the development of the hypotheses used to analyze the relationship between NPL and profitability was the modern portfolio theory.

Modern Portfolio Theory

Modern portfolio theory (MPT) is an investment theory that tries to explain how investors could maximize their returns and minimize their risks by diversification in different assets. The portfolio theory deals with the selection of portfolios that maximize expected returns consistent with the individual acceptable levels of risk (Margrabe, 2007). Optimizing a portfolio is a major area in finance. The aim of portfolio optimization is maximizing the income of the portfolio, simultaneously minimizing the risk. The portfolio theory approach is the most relevant and plays an important role in bank performance studies (Atemnkeng&Nzongang, 2006). Commercial Banks should consider diversifying investments portfolio to minimize the risk of credit takers defaulting in loans repayments and causing non-performing loans portfolios that affect profitability

Theory of Asymmetric Information

Information asymmetry refers to a situation where business owners or managers (borrower) know more about the prospects for and risks facing their business than do lenders (PriceWaterHouseCoopers, 2002). Asymmetric information is that market transaction on the two sides to deal with the subject or content of information in terms of quantity and quality that are not equal (Vojtech, 2013). Information asymmetry occurs when one party to an economic transaction possesses greater material knowledge than the other party. Asymmetric information is a problem in the financial market and in this, the borrower has much better information about his financial state than the lender does. The two most important results of asymmetric information relevant to financial services are known as moral hazard and adverse selection.

The moral hazard refers to a situation in which one party decides how much to take a risk by taking into consideration that someone else will bear the cost when if things go wrong (Krugman, 2009). The theory postulates that the problem of adverse selection may result from information asymmetric between banks customer and the bank which makes it almost impossible to distinguish bad from good prospective borrowers (Richard (2011). So commercial banks face

the uncertainty of loan repayment, as they cannot for sure to assess the creditworthiness of the borrower (Louiz et al., 2010). Thus, the adverse selection causes good prospect borrowers to be displaced by bad prospect borrowers, which throughout the period the overall quality of bank loan portfolios deteriorates and leads to accumulation of non-performing loans, a decrease in profitability, and erosion of capital (Gadzo et al., 2019).

4. EMPIRICAL LITERATURE REVIEW

The relationship between NPL and bank financial performance has been the concern of emerging studies both in developed and developing countries. Several scholars (Kithinji, 2010; Samuel et al., 2012; Adebisi& Matthew, 2015; Ebba, 2016; Kingu et al., 2018; Koju, Koju& Wang, 2018; Ekinci&Poyraz, 2019) who have examined the impact of NPL on the financial performance of banks have come up with mixed conclusions. NPLs were considered one of the main causes of the global financial crisis of 2008, which damaged the USA economy and the economies of many countries. Non-performing loan arises from various sources (Kingu et al., 2018; Kingu, 2018). Banks should identify them and take the necessary steps to eliminate the NPL from the industry. Several empirical studies have been conducted on non-performing loans and profitability of commercial banks all over the world and confirm that there is an adverse effect of NPL on the banks' performance (Kingu et al., 2018; Koju, Koju& Wang, 2018; Ekinci&Poyraz, 2019). The following are some quotes from the article related to NPL.

Karim et al. (2010) investigate the relationship between non-performing loans and bank efficiency in Malaysia and Singapore by using the Tobit regression model. The outcome stated that higher NPL reduces cost efficiency and also the lower cost efficiency increases NPL and profitability. The results also discover that bad management in the banking institutions results in bad quality loans, and therefore, escalates the level of non-performing loans. Besides, Talata (2011) using Ordinary Least Square Regression (OLS) was employed to estimate the effect of non-performing loans on financial performance. The results of the OLS revealed that nonperforming loans, cost-income ratio, loan recovered and total revenue were all statistically significant at 1% significance levels respectively. The liquidity risk was not statistically significant. The non-performing loans and cost-income ratio had a negative influence on financial performance whereas total revenue and loan recovered had a positive effect on financial performance.

Kaaya and Pastory (2013) analyzed the effect of credit risk (measured by ratios of nonperforming loan, loan loss to gross loan, loan loss to net loan, and impaired loan to gross loan) on banks' performance (measured by return on assets) by controlling the effect of deposits and bank size. The results, credit risk measures of non-performing loans, loan loss to gross loan, loan loss to the net loan have a significant negative influence on banks' performance in Tanzania. Similarly, Lata (2015) has analyzed time series data and concluded that NPL is one of the foremost factors that influence banks. The empirical results represent that NPL as a percentage of total loans of SCBs is very high and they hold more than 50 % of total NPLs of the banking industry from FY2006 to FY2013. NPLs were one of the major factors influencing banks' profitability and it has a statistically significant negative impact on the Net Interest Income of commercial Banks in Bangladesh s for the study periods.

Adebisi& Matthew (2015) Data were analyzed using the regression statistical tools. The study approves that the first model of their study revealed there is no significant association between the NPL and ROA of the Banks in Nigeria. The shareholder's return is affected as the second model showed that there is a connection between the NPL and Return on Equity (ROE) of Banks in Nigeria. Besides, Kozaric and Zunic (2015) analyze the Causes and Consequences of NPLs in the Bosnia and Herzegovina banking sector. They conclude that there is a strong correlation between the rate of capital adequacy and non-performing loans, ROA, and ROE. Non-performing loans have a strong negative correlation with indicators of liquid assets share in total assets and liquid assets in long-term liabilities.

Nikolov and Popovska–Kammnar (2016) analyze the non-performing loans in the Macedonian banking system and find that in a period of economic growth and higher inflation; non-performing loans are low and stable. The increase of the capital to asset and return on equity ratios reduces the level of non-performing loans, as well. They conclude that as long as the economy is stable and banks are profitable and have adequate capital, non-performing loans are on a level suitable for the banks. Further, Bhattarai (2016) examines the determinants of Non-Performing loans in Nepalese Commercial Bank. The study found that the NPL ratio harms ROA whereas the NPL ratio has a positive effect on ROE. The study found that the mediating macroeconomic variables such as the real effective exchange rate have a significantly negative impact on non-performing loans. The impact of the GDP growth rate was found to be insignificant in this study

Ebba (2016) examined the relationship between non-performing loans and the financial performance of commercial banks in Ethiopia for the year 2011-2015. A study using a descriptive research design methodology found that NPLs have a significant negative effect on banks. Equally, Ozurumba (2016) examined the Impact of nonperforming loans on the Performance of Selected Commercial Banks in Nigeria covering the period 2000 – 2013. The data were analyzed using the ordinary least square method and ratio analysis. The findings discovered that ROA and ROE have an inverse relationship with non-performing loans and loan loss provision respectively while they are positively related to loans and advances. The conclusion, therefore, is that NPLs have a significant negative effect on the effects on Commercial Banks' performance.

Kingu et al. (2018) in their study examined the impact of NPL on bank's profitability using information asymmetry theory and bad management hypothesis. The study employed Descriptive statistics and multiple regression analysis estimation methods. The study stipulates that the occurrence of NPL is negatively related to the level of profitability in commercial banks of Tanzania. Bishnu P.B (2019) investigate the effect of credit risk on the financial performance of 160 commercial banks in Nepal from 20012 – 2016. The regression results revealed that capital adequacy ratio (CAR), non-performing loan ratio (NPLR), and management quality ratio (MQR) have a significant relationship with the financial performance (ROA) of the commercial banks in Nepal. Similarly, credit to deposit ratio (CDR) and risk sensitivity (RS) has no significant impact on the financial performance of the commercial banks in Nepal.

Ekinci&Poyraz (2019) examined the impact of credit risk on the bank's performance of 26 commercial banks operating in Turkey between 2005-2017. The study uses Return on Asset (ROA) and Return on Equity (ROE) were used as proxies for financial performance indicators while Non-Performing Loans (NPLs) were used as credit risk indicators. The findings of the

panel data results showed that there is a negative relationship between credit risk and ROA as well as between credit risk and ROE. Developed from both theory of asymmetry information and modern portfolio theory, NPLs are thought to reduce the quality of assets thus increasing risks in the bank's portfolios and ultimately reduces the return. According to Ivanovic (2016), NPL is a common indicator to measure credit risk and it directly affects the bank profitability and economic strength of the nation by reducing credit growth (Koju, Koju& Wang, 2018). Excessive NPL portfolio erodes the ability of banks to make profits, they become weak and bankrupted (Ugoani, 2016)

Research Hypothesis

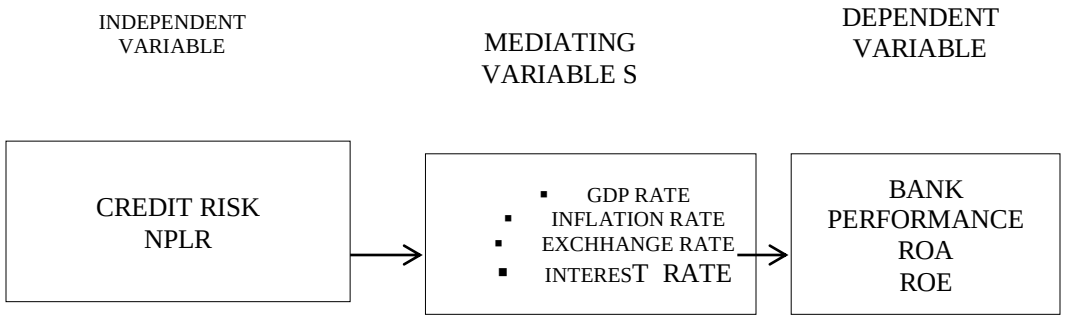
$H0_1$: Non-performing loans does not positively and significantly impact the financial performance of commercial banks in Tanzania

$H0_2$: There is a negative relationship betweennon-performing loans and banks' financial performance of commercial banks in Tanzania

Conceptual framework

Based on the insights gained from a review of the literature, the following conceptual framework showing the relationship between NPL and financial performance of the bank was created. On one side, theconceptual frameworkindicates that non-performing loans constitute the independentvariables.On the otherhand, the commercial bank's performance is the dependentvariable. These variables are based on the CAMEL model. However, according to the theory of modern portfolio and asymmetry information, NPL is caused by adverse selection but also risk arising from the economy as a whole. Thus, the macroeconomic variables were used to mediate the effect of NPL on banks' financial profitability. These factors are called the mediating variables. The annual gross domestic product growth, exchange rate, and inflation rate as the control variables which could also affect the bank's performance. The studywill be guided bytheassumption thatboth independent variables influencebank's performancein Tanzania.

Figure 1: Conceptual framework of influence of NPL on bank profitability



5. METHODOLOGY OF THE STUDY

Research Design and target population:

The overall objective of this paper was to evaluate the effect of non-performing loans on the financial performance of commercial banks in Tanzania. To achieve this objective the study used the quantitative approach in this study to estimate and measure the variables. Also, the researcher used longitudinal explanatory research design, with panel data of 41 licensed and registered commercial banks in Tanzania that have been in existence and operating from 2006 to 2019 and macroeconomic data (2006 to 2019) from the BOT and National Bureau of Statistics of Tanzania. The selected banks represent 100 percent of all bank's assets size, loan size, liabilities positions, and capital and earnings because all commercial banks were included in this study.

According to Saunders et al. (2009) and Denscombe (2010), longitudinal explanatory research emphasizes to study of the relationship between variables. In explanatory studies, the researcher is faced with "cause-and-effect" problems with the major task for the researcher being the separation of such causes (Ghauri&Gronhaug, 2005; Denscombe, 2010). Thus, the causality research design was applied because the study attempted to test and analyze the relationship among hypothesized variables, and also the design is good for analyzing the empirical association between the independent variables and a dependent variable. The current research used descriptive analysis and multiple regression analysis models to analyze data. The multiple regression analysis assumptions were tested, and the data did not violate any of them. The data were tested for normality, linearity, multicollinearity, and heteroscedasticity. The results of our data are 95% confidence interval.

Measurement of Variables

Dependent Variable

Return on asset (ROA); is a financial ratio used to measure the relationship of earnings to total assets. The return on assets represents efficiency in asset utilization and shows how much net income or profit is generated out of assets (Kennon, 2011). Return on assets reflects the ability of banks' management to generate profits from its assets. It is the ratio of net income and total asset of the company and is regarded as the best and widely used indicator of earnings and profitability of the firms together with return on equity (Jahan, 2012).

Return on Equity (ROE) is the maximum return expected by shareholders on their equity after minimized all possible portfolio risks. Return on equity represents the rate of return received from equity investments in banks. It is a ratio of net income and total equity. Harvey (2011) explained ROE as an Indicator of profitability determined by dividing net income for the past 12 months by common stockholder equity. It represents the rate of returns generated by the owner's equity (Ahmed & Bashir, 2013). It shows the effectiveness of management in the utilization of the funds contributed by shareholders of a bank. ROE is a reliable tool for measuring performance and it has been used in many studies all over the world (Gadzo et al., 2019; Islam et al., 2019; Ambrose, 2017)

Independent Variable

Non-Performing Loans (NPL) ratio, which is calculated by dividing non-performing loans by total loans and advances; it is used as an indicator of credit risk. The higher the NPL ratio, the

poorer the credit quality and, therefore, the higher the risk that more loan loss will be charged against income, which decreases bank profitability.

Mediating Variables

Gross Domestic Product (GDP) is the sum of the value-added in the economy during a given period or the sum of incomes in the economy during a given period adjusted for the effect of increasing prices. It is used to proxy the cyclical behavior of the economic activity. GDP is one of the measures of economic growth for a countries economy which is measured in terms of the monetary value of all goods and services produced within the borders of a country during a year. Sufian et al. (2008) and Bikker and Hu (2002) posited that there is a relationship between annual GDP rate and bank profitability

The annual Inflation rate (INFLR) is the persistent rise in the general price level in the economy. The effect of inflation is also another important cause of banking performance, but its impact is not clear. Swings in the inflation rate impact banks as individual firms and also impact the banking industry in broad. Higher inflation can make debt servicing easier by reducing the real value of outstanding loans. However, it can also weaken borrowers' ability to service debt by reducing their real income. Therefore, the relationship between inflation and credit risk can be positive or negative.

*Interest rate (INTR)*is a price of money that reflects market information regarding the expected change in the purchasing power of money or future inflation (Ngugi, 2010). Interest rate is the most crucial factor used by banks when allocating funds to different productive sectors within an economy. Monetarists use the interest rate as an important tool to attract more savings, as increases in the interest rates and the decrease in interest rate will encourage investors to look for another investment that will generate more return accordingly (Murungi, 2014). Theoretically, it was postulated that whilst interest rates are higher, banks make more money, by taking advantage of the difference between the interest banks pay to customers and the interest the bank can earn by investing. Many studies concluded that the interest rate is significantly positively related to bank performance (Yahya, Akhtar, and Tabash, 2017; Obillo, 2015; Sattar, 2014).

Exchange Rate (EXCHR) is the price of one currency expressed in terms of another currency (Akinlo&Mofoluwaso, 2014). In principle, according to the laws of demand and supply, the exchange rate is determined by market forces, driven by the supply and demand of a currency. In this study, the exchange rate was calculated by dividing the net change in the average annual exchange rate over the preceding year annual average exchange rate. The average exchange rate during a fiscal year is used as a measurement for the exchange rate. Akinlo and Mofoluwaso (2014) found that exchange rates exerted a positive influence on non-performing loans. Zribi and Boujelbène (2011) study on determinants of non-performing loans in Tunisian banks concluded that the exchange rate was linked to the increase in non-performing.

Table 1: Operationalization of the Study Variables

Variables	Measurement of definitions	Ratio	Symbol	Impact (Expected sign)
DEPENDENT VARIABLES				
Return on assets	Annual net income divide by total assets	Return on assets	ROA	
Return on equity	Annual net income divide by common stockholders equity	Return on equity	ROE	
INDEPENDENT VARIABLES				
Credit Risk				
Non-performing loan	Non-performing loans to total loans	Non-performing loans ratio	NPLR	-
Controlling Variables				
Annual gross domestic product	The annual growth rate of real gross domestic product	Annual growth of domestic product rate	GDP	+
Annual Inflation rate	Annual general inflation rate	Annual Inflation rate	INFL	+ or -
Exchange rate	Annual average exchange rate appreciation (+) or depreciation (-) of TZS against US dollar	Exchange rate	EXCH	+
Interest rate	Interest rate	Lending rate	INTER	-

Source: Own Compilation, 2020

Data Analysis Techniques and Procedures

This study adopted both descriptive and multiple regression models and this was solved by using a statistical tool (STATA 14).

Descriptive analysis

The descriptive analysis summarizes and describes the basic characteristics of the dataset in a study by breaking down the data into measures of central tendency and measures of variability (Al-Saleh&Yousif, 2009). A measure of central tendency includes the mean, median, and mode. A measure of variability includes standard deviation, skewness, and kurtosis. The purpose of descriptive statistics was to understand the extent of NPLs.

Inferential analysis

Multiple regression models

According to Kingu (2018), panel data is analyzed using different estimation methods depending on the research questions and objectives. Nevertheless, the two most popular regression estimation models applied in similar studies were; Pooled regression (OLS) model, the Fixed Effects (FE) regression model, and Random Effects (RE) regression model. However, the OLS property violates the assumption of the classical linear regression model (there is no correlation between the error term and the independent variables) and thus can lead to biases and inconsistent results. Therefore, for the reason that OLS fails to control for the heterogeneity effect in panel data, the current study used Fixed Effects (FE) model and Random Effects (RE) model to analyze the effects of independent variables on dependent variables.

However, the regression models were limited to mere predictions which involve direct measurement of variables (dependent and independents) to estimate the relationship of the independent variables (predictors) only with the outcome or dependent variable (Bollen& Pearl, 2013). Besides, in regression analysis, the estimation of mediator effects involves the creation of a product variable, which has low reliability and reduced prediction power. As a result, it is difficult to find mediation effects. A solution is to switch to structural equation modeling (Frazier, Barron &Tix, 2004; Echambadi& Hess, 2007; Steinmetz, Davidov& Schmidt, 2011)

In contrast, the SEM is usually used for mediator variables to find out their relationships in an integrated approach based on a validated theory (Baron & Kenny, 1986; Frazier, Barron &Tix, 2004). The mediator variables are not directly measurable. SEM is a good one to show the inter-relationships of mediator variables and with its outcome. The SEM provides both direct and indirect effects of mediator variables on the outcome (Shrout& Bolger, 2002). Mediating with the direct and indirect effect is almost impossible in the case of regression analysis. The major benefit of SEM models is the potential to add and investigate measurement models, in which mediating variables (factors) are proposed and evaluated, and that paths among these mediating variables may be estimated and considered. Consequently, in this study, SEM was used to model and estimate the effects of mediating variables namely macroeconomic variables (annual inflation rate, GDP rate, interest rate, and exchange rate) on banks profitability (ROE and ROA)

The Haussmann tests were conducted to decide between the fixed effects model and random effects model estimating effects of NPL and macroeconomic variables on ROA and ROE respectively. The results and judgments are indicated in Table 2. The null and alternative hypotheses underlying this test were;

Ho: The random effect model is appropriate
H1: The fixed effect model is appropriate

Table 2: Haussmann test results

Analysis	p-value	Judgment (Null hypothesis)	Chosen model
NPL versus ROA	0.0618	Rejected	Fixed effects
NPL versus ROE	0.0328	Fail to be rejected	Random effects

Source: Field Data 2019

Specification of the regression models:

Based on Haussmann test results, the impacts of NPL on ROA the fixed effect regression model was estimated whilst for ROE the random effect model was estimated. The models were specified as:

$$\mathbf{ROA_{it}=\alpha+ \beta_1 NPLR+ \beta_2 INF+ \beta_3 GDP+ \beta_4 INTR+ \beta_5 EXCHR+\varepsilon_{it}}$$

$$\mathbf{ROE_{it}=\alpha+ \beta_1 NPLR + \beta_2 INF+ \beta_3 GDP+ \beta_4 INTR+ \beta_5 EXCHR+\varepsilon_{it}}$$

Where:

't' represents the years
A is a constant term
ε_{it} is an error term or unexplained residuals
β_1, β_2, β_3, β_4, β_5, are coefficients of independent variables
ROA= Annual net income divide by total assets
ROE= Annual net income divide by common stockholders' equity
NPLR= Non-performing loans to total loans
The GDP=Year-on-year GDP growth rate
INTR=Lending Rate, in percentage,
INFLR=Annual Inflation rate, in percentage,
EXCHR=Annual average exchange rate appreciation (+) or depreciation (-) of TZS with US dollar

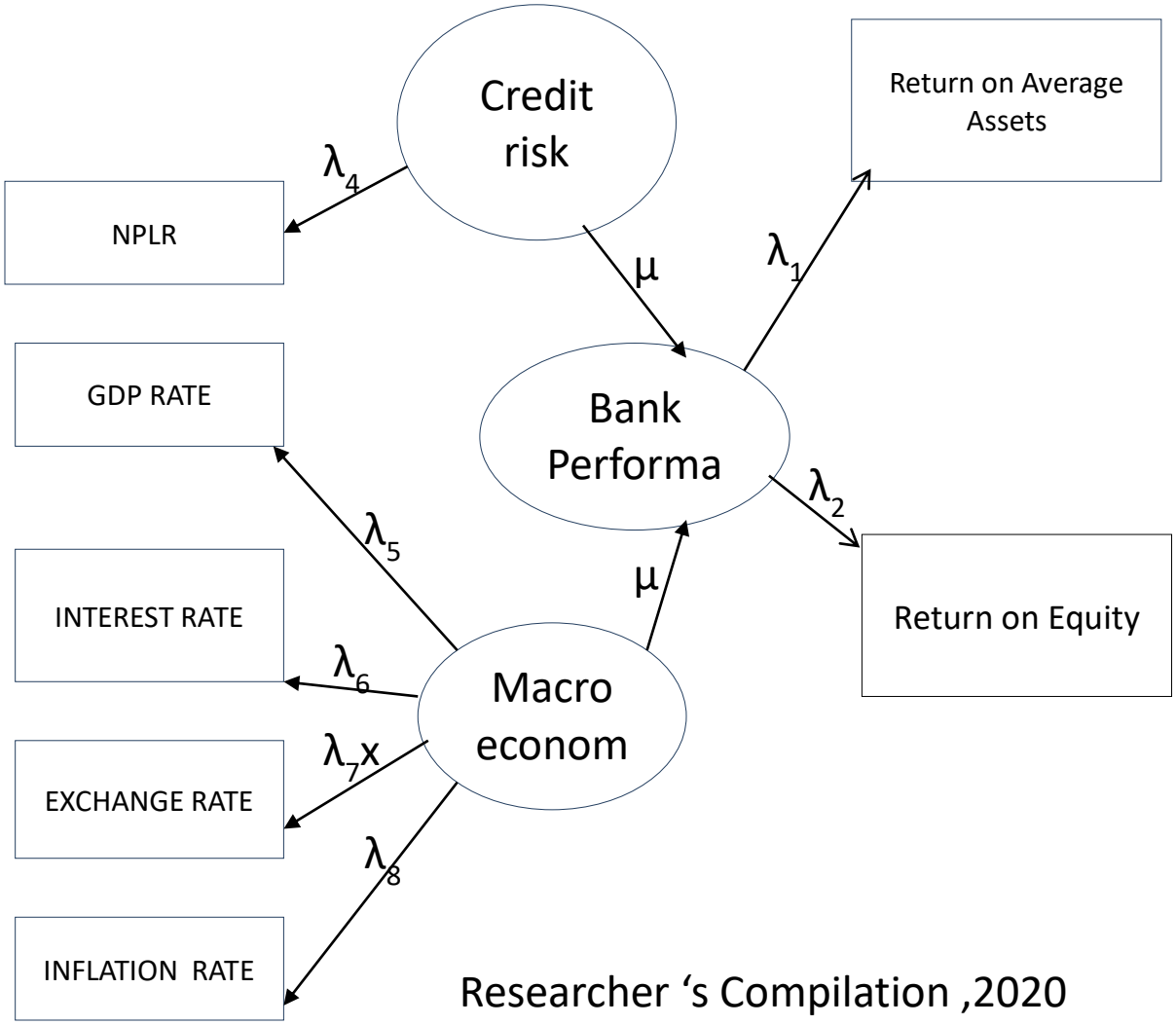
Structural Equation Model Set up

The SEM specification for this research is represented in figure 1;
Based on the model developed in Figure 1, the following research hypothesis is developed:

Ho: Bank's credit risk (NPL) has a direct effect on its performance.

H1: Bank's credit risk (NPL) has no direct effect on its performance.

Figure 2: Structural Equation Model Set up



In this study, the model contains two latent variables namely credit risk and bank performance. In this case, credit risk is the endogenous variable while bank performance is the exogenous variable. SEM involves two main parts; structural model testing and model validation.

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Structural Model Testing

$\mu_1 = \lambda_1\xi_1 + \xi$……. (1)

Whereby;

$\mu_1$is an endogenous latent variable (non-performing loan)

$\xi_1$is an exogenous (predictor) latent variable (bank performance)

$\lambda_1$is the regression coefficient

The observed variables are related to latent variables by measurement equations for exogenous and endogenous variables. The equations are as follows;

Return on Equity = $\lambda_1\mu_1 + \varepsilon_1$…… (2)

Return on Average Assets =$\lambda_2\mu_1 + \varepsilon_2$…… (3)

The exogenous variables are defined as follows;

NPLR = $\lambda_1{}^{x} + \upsilon 1$……...…… (4)

GDP = $\lambda_2{}^{x} + \upsilon 2$…… (5)

Inflation rate = $\lambda_3 x + \upsilon 3$……. (6)

Interest Rate = $\lambda_4 x + \upsilon 4$……. (7)

Exchange Rate = $\lambda_5 x + \upsilon 4$…….……. (8)

6. RESEARCH FINDINGS AND DISCUSSION

Findings in Table 3 indicate that the mean return on average assets was 0.022 with a standard deviation of 0.061 which is relatively low for an average figure. This implies that on average banks earn a 2.2% return on their assets. The skewness value was 5.116 which indicates a tremendous variation across the mean showing that some banks enjoy very large ROAA while others performing poorly while kurtosis value stood at 50.178 which shows a leptokurtic distribution. When it comes to return on equity (ROE), on average the mean value was 0.026 with a standard deviation of which indicates little spread from the mean 0.073. The values were skewed towards the positive side which shows that they were higher than the mean value and kurtosis of 50.234 reveals the fact that normal distribution was fatter around the tails which makes it leptokurtic.

Table 3: Results of descriptive statistics for study variables

ariable	um of Wgt	ean	Std ev	arianc e	skewn ess	skewn ess
NPLR	64	.060	.113	.013	3.161	15.101
ROA	64	.022	.061	0.004	5.116	50.178
ROE	64	.026	.073	.005	5.122	50.234
Inflation Rate	64	.501	.554	2.629	0.655	2.398
GDP Rate	64	.653	.163	1.353	-0.136	1.846
Interest Rate (INTR)	64	.162	.009	.000	0.733	2.852
Exchang e Rate (EXCHR	64	984	57	6141	-0.280	1.547

Source: Field data (2020)

Besides, non-performing loans to gross loans (NPLR) on average its mean value was 0.060 with a standard deviation of 0.113 which is relatively low, the skewness was 3.161 which indicates a huge deviation of values among banks with a leptokurtic normal distribution indicated by a large kurtosis value of 15.101. However, further econometric tests for normality revealed that the variable is normally distributed, hence suitable for further analysis to estimate its effect on a bank's performance. The mean value of 0.06 or 6% was considered low given the fact that for every. 1,000,000 TZS gross loan extended, only 60,000 TZS becomes a non-performing loan. This result implies that during the period 2006-2019, the danger of non-performing loans was very little.

Moreover, the results presented in Table 3 indicate that the average inflation rate (INFR) during the study period was 8.5% which is a single digit and within the acceptable level but caution must be exercised. This inflation rate indicates macroeconomic stability buy the general price level if not controlled can result in too much demand that suppliers can't keep up. The standard

deviation was 3.5 which shows that in some years, inflation rates were much lower or higher compared to the mean figure. Skewness measure indicates the value of 0.655 which shows that values were inclined to the positive side and most of them were higher than the mean value and finally kurtosis of 2.398 shows that the normal distribution was smooth and flatter around the tails making it leptokurtic. Besides, the real GDP growth rate on average had a value of 6.6% with a standard deviation of 1.163 which makes Tanzania among the countries enjoying high economic growth in the sub-Saharan region. The skewness value was -0.13 which indicates that most values were below the mean with a kurtosis value of 1.846 indicating a leptokurtic distribution.

About another variable named interest rate (INTR), the mean value was 0.162 with a very small standard deviation of 0.009 which is relatively higher as central banks strive to maintain single-digit rates. Most values were below the mean based on skewness with kurtosis of 2.852 which indicates a smooth normal distribution namely leptokurtic. The other macro-economic variable was the exchange rate (EXCHR) and the mean value was TZS 1,984 per USD with a standard deviation of 257 around the mean. Most of the values were skewed below the mean with normal distribution being smooth with fatter tails.

Regression results for model 1

The multiple regression model results presented in Table 4 show those non-performing loans had an insignificant relationship with ROA as explained by their p-values that are above the 0.05 confidence interval. One of the mediating variables, the annual GDP rate, was significant and negatively related to the financial performance of commercial banks in Tanzania. This implies that as the annual GPD rate increases the profitability of banks falls. The results depict that, as the GDP rate raises by 1000% bank profitability decrease by approximately 9 TZS only. However, the annual inflation rate and interest rate were found to have an insignificant relationship with ROA whilst the exchange rate had a positive and significant impact on ROA. The multiple regression model is generally significant because the Prob> F = 0.0018 is less than the 0.05 confidence interval. The coefficient of determination is approximately 0.3149 i.e. 31.5% which indicates that 31.5% of the variations in ROA are a result of the explained independent variables.

Table 4: Results of regression for correlation between NPL and ROA

Variable	Coef.	Std. Err.		P>t
NPLR	-0.0165267	0.035721	0.46	0.644
INFLR	0.0014895	0.010909	.37	0.173
GDP	-0.0089027	0.003095	2.88	0.004
INTR	-1.216654	0.752265	1.59	0.112
EXCHR	0.000056	0.000026	.16	0.031
Constant	0.0746693	0.03866	.93	0.055

Prob> chi-square= 0.0018

Source: Field Data 2020

Regression results for model 2

Non-performing loans was revealed to have a negative but insignificant relationship (Table 5) with ROE as explained by their p-values that is above the 0.05 confidence interval. The annual GDP rate was found to have negative and significant effects on the financial performance of commercial banks in Tanzania. This implies that as the annual GPD rate increases the income of bank owners decreases. The results depict that, as the GDP rate raises by 1000% bank profitability decrease by approximately 10.5 TZS only. Also, Table 5 indicates that the exchange rate impacted ROE positively and significantly. However, the annual inflation rate and interest rate were found to have an insignificant but positive and negative relationship with ROA respectively. The overall random-effects model was significant (Prob> chi-square p-value = 0.0011) to explain the relationship between credit risk components and return on equity

Table 5: Results from Random effects regression analysis for the relationship between credit risk and ROE

Variable	Coef.	Std. Err.	Z	P>t
NPLR	-0.0636635	0.0400097	1.59	.112
INFLR	0.0024559	0.0013196	.86	.063
GDP	-0.0105013	0.0003823	2.75	.006
INTR	-1.468749	0.9180912	1.6	.11
EXCHR	0.0000671	0.0000312	.15	.031
Constant	0.1203993	0.0372156	.24	.001

Prob> chi-square = 0.0011
Source: Field Data 2019

Structural equation modeling results

The results from Table 6 indicate that operational risk has a significant negative impact on bank performance as indicated by its p-value of 0.045 which is less than the 0.05 confidence interval. Credit risk was observed to have a significant relationship with bank performance as indicated with its p-value that was < 0.05 confidence interval. The non-performing loans ratio exhibited a negative relationship with bank performance indicating that non-performing loans tend to reduce banks' profitability.

Table 6: Results from confirmatory factor analysis and path analysis

	riginal sample	ample mean	td	- statistic s	- Values
Macroeconomic →Credit risk	.702	.703	.113	.584	.012
Macroeconomic →performance	.125	.114	.091	.214	.084
Credit risk →performance	0.476	0.487	.324	.854	.027

Source: Field Data 2020

Hypothesis tests the results of the study variables

Hypotheses tests of this study are based on the results provided by model 1 & 2 (Table 7). Hypotheses tests of between independent variables with ROA were provided with model 1 whilst hypotheses testing of independent variables with ROE were provided by model 2. The results are summarized in Table 7 and 7.1. Acceptance of hypothesis is based on the level of statistical significance (p-value) of up to 5 percent, while p-value higher than 5 percent were rejected

Table 7: Hypotheses Tests of Impact of Credit Risk Variables on ROA

Variable	Hypothesis	Expected sign	Actual sign	Statistical significance
NPLR	$H0_1$	-		Not significant

Table 8: Hypotheses Tests of Impact of Credit Risk Variables on ROE

Variable	Hypothesis	Expected sign	Actual sign	Statistical significance
NPLR	$H0_1$	-		Not significant

Source: Field Data 2020

Hypothesis H01: The study hypothesized that non-performing loans do not positively and significantly impact the financial performance of commercial banks in terms of ROA. The results found that NPLR was negatively and insignificantly associated with ROA, which is contrary to what this study had hypothesized. So, the study failed to support the hypothesis H01.

Hypothesis H02: The study hypothesized a negative relationship between non-performing loans and ROE. The results found that NPLR is negatively and no significantly associated with ROE, which is contrary to what this study had hypothesized. So, the study failed to support the hypothesis H02.

7. DISCUSSION

According to BOT (2014), the NPL is a loan in which a borrower does not make any interest and principal payments for at least 90 days or classified as substandard or doubtful or loss. From the theoretical framework, we know that NPLR is a financial indicator that demonstrates the quality of bank loans and how commercial banks are exposed to the risk of default or late payment from loan borrowers. The core activity of commercial banks is to make loans. Banks make money from a series of activities of borrowing and deposit. NPL is considered as losses when happens. Higher NPLR means higher losses, which adversely influence the banks' available capital for further borrowing and investments. Hence, the efficiency of banks' investment is affected, further influencing negatively the profitability of commercial banks. On the contrary, lower NPLR is related to the lower risk and deposit rate, meaning a positive impact on banks' operations and profitability.

The findings of this study indicated that the non-performing loans to gross loans ratio (NPLR) in the Tanzanian commercial banking industry for the last 13 years from 2006-2019 was 0.060 (6.0%) on average with a standard deviation of 0.1131. The magnitude of standard deviation demonstrated that there existed high variability with NPLR among Tanzanian commercial banks. This can be attributed to the variations in the size of banks under study in terms of capital and requirements by BOT and their heterogeneity concerning this measure. The variation was observed to emanate from the differences both within banks and between banks. Although the ratio is slightly above the BOT threshold of 5.0% (BOT, 2016), this NPLR is considered low given the fact that for every TZS 1,000,000 gross loan extended to borrowers, only TZS 60,000 becomes NPL.

Therefore, these findings suggest that, from 2006 to 2019, the danger of NPL was very little in Tanzanian commercial banks implying that BOT and bank managers have improved credit risk management mechanisms in the banking industry. According to BOT (2017) and Ng'wanakilala (2017), the ratio of non-performing loans to gross loans increased from 8.2 percent in April 2016 to 10.8 percent at the end of April 2017 in Tanzania's banking industry. The results in general implied that the accumulation of NPL which was claimed as the critical problem of the banking sector in previous studies (BOT, 2004; Simpasa, 2011; IMF, 2015: Ng'wanakilala, 2017) showed an improvement.

The presence of high NPL in the commercial banking industry in Tanzania for a long time was due to the belief that 'high risk and high return are correlated' (Abraham, 2006). This belief led to an acceptance of higher credit risks unless accompanied by a rigor credit risk management and strong effective loan service process, these risks resulted in high NPL. Higher NPL indicated that there was more risk for losses from loan default. However, in recent years NPL is decreasing in Tanzania (Pastory et al., 2013; Magali and Qoing, 2014) and in most African countries the experience is the same (Melkamu, 2012; Gizaw et al., 2015; Nthambi, 2015; Mengesha, 2016; Sporta, 2018) and in Asian countries (Islam, 2014; Rahman et al., 2015).

The lower NPLR is linked with the lower risk and deposit rate, meaning a positive impact on

banks' operations. This implies that the lower the NPLR, the higher the asset quality and therefore positive trade-off between asset quality and financial performance of commercial banks. Though descriptive results indicated a sharp decrease in NPLR, yet the critical condition of credit risk management on the efficient utilization of assets by Tanzanian commercial banks emerged in this study. Thus, for higher returns, the bank managers ought to tighten the borrowers referencing and scrutinization to minimize the number of defaulters. The results in this respect are consistent with the findings of Funso et al. (2012), Gizaw et al. (2015), and Sporta (2018).

In the case of the relationship between NPLR and ROA, this study found a negative non-statistically significant association between the two variables. Thus, there is no enough evidence to support possible explanations to make any inferences of the findings. Needled to say, most studies had found a negative but statistically significant relationship between NPLR and ROA (Kargi, 2011; Epure and Lafuente, 2012; Ara, Bakaeva, and Sun, 2009; Felix and Claudine, 2008). Concerning the profitability measured by ROE, which indicated how far the bank earned from their owners' investments, NPLR showed a non-significant negative effect on the commercial bank's profitability. This can be explained that, as the lending business was risky, was also difficult for commercial banks in Tanzania to realize profits from their owners' monies. The results of the negative effect of NPLR on ROE are consistent with the findings of Achou and Erguh (2008), Kithinji (2010), and Kargi (2011), Muhammad et al (2012), Madishetti and Rwechungura (2013), and Gizaw et al. (2015).

Compared with the impact of NPLR on ROA, the effect was greater on ROE implying that commercial banks in Tanzania are resilient enough in credit risk management and thus are liquid enough to finance their investments as well as ability to lend money to borrowers. In another word, the commercial banks in Tanzania more than often use their owners' money (shareholders' money) to finance their lending operations than the banks' assets. So, when NPL rises the bank loses its investors' money more than its assets. And this is why BOT regularly controls the amount of NPL lest banks misappropriate clients' monies.

Also, this suggests that as banks continue lending money to borrowers, the bad debt is likely to decrease banks' profitability. The results might imply that the lending business in Tanzanian commercial banks is riskier and unpredictable. Furthermore, according to Hassan (1999), ROE is also an indicator of measuring managerial efficiency; higher ROE means better managerial performance. Thus, ROE might be due to financial leverage which creates an important difference between ROA and ROE. Usually, financial leverage always magnifies ROE (Ross, Westerfiled& Jaffe, 2005).

The negative relationship between non-performing loans and commercial banks' profitability suggests that loan losses reduce a bank's profit. This implies that commercial banks do not have sound and effective credit risk management strategies. Theoretically, non-performing loans reduce the profit levels of commercial banks but in a situation where non-performing loans are increasing consistently, it means that commercial banks do not have effective measures to manage the credit risk. This result suggests that the banks shift the cost on loan default to other customers in the form of higher interest rates on loans. However, a higher interest margin

charged on loans by commercial banks due to weak credit risk management practices has not increased the bank's profitability. This is supported by the data from BOT monthly economic reviews of 2006-2019 in Table 8, which shows how lending interest rate was increasing from 2006 to 2017 with a small break in 2009-2011.

Table 8: Lending Rates in Tanzania

014	015	016	017	018	019
6.2	6.39	5.66	8.62	4.9	4.31

Source: BOT Monthly Economic Review 2014-2019

Similar to the results of this study, Felix & Claudine (2008), Funso et al. (2012), Boahene (2012), Bizuayehu (2015), Gizaw et al (2015) while investigating the relationship between bank performance and credit risk management found that ROE was inversely related to the ratio of non-performing loan to total loan, thereby leading to a decline in profitability of commercial banks. Therefore, the current research establishes that NPLR is an important determinant of ROE in Tanzanian commercial banks.

Therefore, it can be concluded from preceding researches that, NPLR is a financial indicator that demonstrates the quality of bank loans. In the lending business, NPL is considered as losses. Since, the core activity of commercial banks is to create credit by deposits and borrowings, thus higher NPLR means higher losses, which adversely influence the banks' available capital and assets for further credit creation and loaning. Hence, the profitability of banks is affected negatively (Gizaw et al., 2015). On the contrary, the lower NPLR is linked with the lower risk, meaning a positive impact on banks' operations. In this study, though NPL was found below, it has also been found to have a negative effect on ROA and ROE. Thus, as NPLR raises bank profitability falls. The NPLR had found to have large effects (six times) on the bank's profitability in terms of ROE than the effect on ROA. However, it was difficult to infer the effects of NPLR on ROA and ROE to Tanzanian commercial banks.

However, the results in this study suggested the need for stronger credit risk and loan service process management to be adopted to keep the level of NPL as low as possible (5.0%) which will enable to maintain of the high profitability of commercial banks in Tanzania. According to Olweny and Mamba (2011), small and medium banks with the highest ratio of non-performing loans to a gross loan are associated with low profitability. This result is in agreement with Sporta (2018). But, for Tanzanian banks, the good thing is, the BOT is making a lot of efforts to reduce the NPLR to as low amount as the minimum requirement of five percent (Ng'wanakilala, 2017) by tightening the regulations of financial institutions.

Impact of Gross Domestic Products on the Financial Performance of Banks

Gross domestic product is the sum of incomes in the economy during a given period. Nominal GDP is the determination of GDP without taking into account other factors or variables such as inflation (Daferighe&Aje, 2009). The real GDP is the sum of the value-added in the economy during a given period adjusted for the effect of increasing prices or inflation. As a macroeconomic indicator, real GDP growth is a measure of the change in total economic activities of a country in a given year. It is assumed to have a positive impact on growth in GDP on the profitability of banks (Demirgüc-Kunt& Huizinga, 1999; Bikker& Hu, 2002; Athanasoglou et al., 2008). Since the increment in GDP can sometimes be influenced by the rise in price rather than the production of goods and services in the economy. So, to measure production and its change over time, the effect of increasing prices need to be eliminated. This presumes that in the determination of GDP growth from one year to another, real GDP gives a more correct assessment of the economy. Hence, in this study annual growth in real GDP (GDP) was used as a potential determinant of profitability.

According to Mirzaei et al. (2013), the growth of real gross domestic product affects the demand for a bank's assets and supply of funds. During the declining real GDP growth, the demand for credit falls which in turn negatively affects the profitability of banks. On the contrary, in a growing economy, as expressed by positive real GDP growth, the demand for credit is high due to the nature of the business cycle. During a boom, the demand for credit is high compared to recession (Athanasoglou et al., 2005), and the ability to repay loans increases, which reduces the volume of bad loans (Khemraj& Pasha 2009) and hence increased the level of commercial banks profitability (Rahman, Hamid, and Khan, 2015).

The findings of the current study showed that the mean value of real GDP growth rate was 6.65% indicating the average real growth rate of the country's economy over the 10 years from 2006-2019, the period under investigation which, showed little dispersion towards the average over the period. This GDP growth rate was lower since the desire for a country like Tanzania which is on a verge of development is double-digit (World Bank, 2003; United Nations, 2018; 2019). According to Daferighe&Aje (2009), in the period of crisis, GDP growth becomes low and the correlation coefficient between GDP growth and bank profitability becomes negative. No wonder, in the current study the association between GDP growth and banks' earnings was negative and statistically not significant. This implies that there is no concrete evidence to support the assumption that an increase in GDP growth influences banks' earnings. The results of this study corroborated with a study by Vong et al. (2009) and Bizuayehu (2015) which, revealed that GPD has a non-significant impact on banks' profitability. This is consistent with the work of Bennacaur&Goaied (2008).

Furthermore, in the current study GDP growth had found to have a statistically significant negative impact on both ROA and ROE. This implies that commercial banks in Tanzania would not realize profits even if GDP growth was to increase. This result could be explained by Trujillo-Ponce (2013) that poor economic conditions can worsen the quality of the loan portfolio, generating credit losses and increasing the provisions that banks need to hold, thereby reducing bank profitability. Likewise, Mirzaei et al. (2013) augmented this result that the level of

economic activity also affects the supply of funds, deposits, and especially when deposit supply declines due to a rise in consumption in line with GDP growth. However, many empirical studies had found that GDP growth and NPLs were found to be negative, implying that an increase in GDP usually decreases the non-performing loans (Foos et al. 2010; Khemraj& Pasha 2009; Salas &Saurina 2002).

According to the literature, GDP growth usually increases the incomes of households and firms, which ultimately enhances saving and investment capacity (Khemraj& Pasha 2009; Trujillo-Ponce, 2013; Bizuayehu, 2015). Ultimately increases repayment capacity thus reducing NPLs and hence increases bank's profitability as Anna (2013) stated that, an increase in GDP growth rates translates into higher income and improves the debt servicing capacity of borrowers, which results in the lower credit risk of banks. On the contrary, the IMF report, persistent increase in GDP has led to an increase in loans between the periods from 2003-2010, and this increase in loans resulted in a rise in nonperforming loans. According to Joel (2002), an increase in nonperforming loans reduces profitability greatly. But, the finding of the current study was contrary to those past studies. The GDP growth rate recorded was low. Commercial banks in Tanzania had shown a negative impact on GDP growth on bank profitability. So, the negative effect could be due to the low supply of funds and decreasing demand for bank assets.

Similarly, past studies have contradicting results. While Kosmidou (2008) and corroborates with the results of the current study, Bizuayehu (2015) found a positive impact of GDP growth on ROA and a more recent study by Gaber (2018) indicated that GDP growth has a positive significant impact on banks' earnings, possibly due to an increase in lending rates with less probability of a default rate. Tesfaye (2014) is consistent also with the current study found that the GDP growth rate has no significant effect on banks' earnings. Moreover, a non-significant relationship is further found between banks' earnings measured by ROA and ROE with GDP growth (Rahman, Hamid & Khan, 2015). Furthermore, Athanasoglu et al. (2008) found a positive association between GDP growth and bank profitability in Greece. Likewise, Dietrich &Wanzenried (2011) and Zeitun (2012) found a positive correlation between GDP growth and bank earnings. On the contrary, in an extreme case, Ben Naceur (2003) found no impact of GDP growth on the profitability of Tunisian commercial banks.

5.7.2 Impact of Inflation on the Financial Performance of Banks in Tanzania

The effect of inflation is also another important determinant of banking performance, but its impact is not clear. Inflation Rate (INF) has been widely used as a proxy for the effect of the macroeconomic environment on the bank performance (Flamini et al., 2009; Chen et al., 2018). The relationship between the inflation rate and profitability is somewhat ambiguous and often depends on whether or not inflation is anticipated (Perry, 1992). In support, Athanasoglou et al., (2005), state about the Greek situation that the relationship between inflation level and banks profitability is remained to be debatable. Moreover, Vong and Chan (2009) stated that the direction of the relationship is not clear. According to Ravi (2013), higher inflation can make debt servicing easier by reducing the real value of outstanding loans. However, it can also weaken borrowers' ability to service debt by reducing their real income. Therefore, the

relationship between inflation and credit risk can be positive or negative.

The results of the current study showed that the mean value of the inflation rate was 8.5% indicating the average inflation rate over the 10 years from 2006-2019, the period under investigation with little dispersion towards the average. This inflation rate is categorized as walking inflation between 3-10% a year. This type of strong, or pernicious, inflation is harmful to the economy because it heats economic growth too fast (Erdmenger et al., 2012; Lim &Sek, 2015). At this rate of inflation, people start to buy more than they need, just to avoid tomorrow's much higher prices. This drives demand for credit even further so that banks can't keep up. As a result, the interest rate becomes out of the reach of most people. Although that is not actually what happened in Tanzania during 2006-2019, since then toward the current years, many commercial banks recorded high NPLs. Vividly; in very recent Ng'wanakilala (2018) stated that the average ratio of bad loans to gross loans in the commercial banking sector of Tanzania reached 11.3% in 2018 from 10.8% in 2017. He further added that the Bank of Tanzania expects to cut a commercial bank's ratio of bad loans to gross loans to a minimum of 5.0%.

Bluntly, Chen et al., (2018) put that, high inflation rates are generally associated with a high loan interest rate. Thus, a high-interest rate increases the cost of borrowing, which leads to an increase in the obligation of borrowers resulting in an increase in the credit risk and thus high NPLs and eventually lower bank profitability. Ben, Naceur&Kandil (2009) explained this result by the fact that a higher inflation rate (was approximately 6.5%) in Tunisia increased uncertainty and reduced demand for credit. In an attempt to alleviate this situation, banks reduced the cost of intermediation which had affected both salaries and other operating costs of the bank. Similarly, in Rwanda, the 12-months inflation of 8.7 percent in 2009 eroded the public purchasing power which forced people and other business ventures to borrow from banks to cover the lack of sufficient capital in their operations (Central Bank of Rwanda 2010 as cited by Magnifique, 2013).

However, Al-Khouri (2011) found that the rate of inflation is irrelevant as Perry (1992) indicated that the relationship between inflation rate and bank performance depends on whether inflation expectations are fully anticipated. Perry argued that an anticipated inflation rate implies that banks can appropriately adjust interest rates to increase their revenues faster than their costs and thus acquire higher economic profits, vice versa is true. With Return on average assets of 2.2%, the commercial banks of Tanzania seemed to have anticipated the inflation rate and thus adjusted their interest rates to maintain their costs while trying to stabilize their incomes. This is confirmed by the report on a review of Tanzania banking sector performance conducted by Ernest and Young in the year ended 31st December 2009 (Ernest & Young, 2010). Also, BOT quarterly economic bulletin from 2010 to 2017 supports this argument.

Despite all, the current study found the association between the inflation rate and banks' profitability was positive and statistically not significant. This means that there is no actual evidence to substantiate the impact of the inflation rate on banks' profitability measured in terms of ROA and ROE. Therefore, the non-significant result cannot further be elaborated clearly. However, the results of this study corroborated with a study by Bizuayehu (2015), which

revealed that the inflation rate had no significant impact on banks' profitability. Similarly, Al-Khouri (2011) found that the rate of inflation was not significantly related to profitability. But, the findings from the previous studies regarding the relationship between inflation rate and profitability are varied. In Kenya, Ongore&Kusa (2013) revealed that the inflation rate had a negative but significant effect on all banks' profitability measures at a 99% confidence level and it was inconclusive at a 95% confidence level. This is probably because inflation could have affected the value for money, purchasing power of people, and the real interest rate that banks charge and receive.

In agreement, Hassan (2005), Khrawish (2011), Syafri (2012), and Rachdi (2013), found that the inflation rate had a negative impact across all commercial bank's profitability measures. On the other side, studies by Sofoklis (2009), Tan and Floros (2012), Tomak (2013), Bizuayehu (2015), and Chen et al. (2018) show that high inflation rates lead to higher bank profitability. In general, high inflation rates are associated with high loan interest rates and thus high income. This however is not always true since a decline in inflation rates can result in higher bank profits. It is because the decline in the inflation rate causes interest rates to decline. This reduces the cost of borrowing and increases the demand for loans by the borrowers. Since interest charged on loans is low, the rate or chance of borrowers to default is also low. Hence, the banks' profits rise. This phenomenon explains the negative relationship between inflation and banks' earnings.

5.7.3 Impact of Exchange rate on the Financial Performance of Banks in Tanzania

The Exchange Rate is the rate at which one currency is exchanged for another currency or the price of one currency in terms of another currency (Engel and Zhu, 2017). It is determined by market forces, driven by the supply and demand of currency (Berger and Bouwman, 2010; Engel, 2016). The supply of currencies is explained by changes in fiscal policies whereas currency demand is influenced by a wide range of factors such as inflation rates and interest rates (Brunnermeier&Lasse, 2009). In this study, the exchange rate was calculated by dividing the net change in the average annual exchange rate over the preceding year annual average exchange rate. In international banking, the variability of foreign exchange rates is a potential factor of interest that drives the level of profitability of commercial banks as it affects their financial intermediation process (Chiira, 2009). Exchange rate fluctuations influence a country's prices through import prices of consumption and intermediate goods (Watkins, 2014). According to Gatobu (2013), the main function of commercial banks is to mediate between the supply side and the demand side of the foreign currency.

In the current study estimated coefficient of the exchange rate was positively and significantly related to both ROA and ROE. This implies that depreciation of the Tanzanian shilling is associated with an increase in banks' profitability. The finding is in line with theoretical arguments. Moreover, the findings support the claim that depreciation of the domestic currency reduces borrowers' incomes and ability to repay their loans. A depreciation of domestic currency affects the borrower in three ways; first, it reduces the borrower's purchasing power, thus reduces the borrower's ability to spend on the same quantity of goods and services. Second, it creates demand for additional credit to cover the deficit, which increases the borrower's repayment burden. Thus, increases the chances of default. These results are consistent with the

results of Vatansever and Hepşen (2013) in Turkey. Thirdly, as the local currency depreciates it becomes expensive to import goods, and hence this might trigger an increase in the price of goods and services in the economy (Watkins, 2014). An increase in the price of goods and services will further warrant an increase in demand for credit. As result interest rates will rise, hence the profits of the banks.

Other studies that examined the influence of the exchange rate on the bank's profitability revealed mixed results. Wong and Leung (2008) examined exposure of foreign exchange of Chinese banks and found that appreciation of foreign exchange minimizes equity values thus hampering the bank's performance. Opaluwa, Umeh, and Ameh (2010) investigated the effects of exchange rate fluctuations and found that exchange rate fluctuations and performance have a statistically significant association. Other studies that found similar results were; Owoeye and Ogunmakin (2013), Kinyuma (2013), and John (2016).

5.7.4 Impact of INTR on the Financial Performance of Banks in Tanzania

Among other risks faced by banks, interest rate risk plays an important role in banks' financial performance since a large chunk of banks' revenue accrues from loans from which interest is derived. However, interest rate risk is directly linked to credit risk inferring that increment in interest rate increases the chances of reducing banks' profit. So, credit risk and interest rate risk are intrinsically related to each other and not separable. The interest rate is found to be positive but the result is found not to be statistically significant. The result suggests that increases in lending interest rates were associated with the increase in the level of banks' profitability, but the lending interest rate has no explanatory power over the profitability of commercial banks in Tanzania. The result lends support to the modern portfolio theory, which suggests that higher interest rates motivate the banks to extend credit in risky projects that create room for increased returns. In line with this theory, the result of this study supports the claim that the interest rate drives revenues of commercial banks. As a result, bank managers tend to focus on growing revenue at the expense of the quality of borrowers and face adverse selection, which leads to high NPLs.

8. CONCLUSIONS AND IMPLICATIONS

In this study, panel data methods were applied to examine the influence of NPL on bank performance measured by ROE and ROA. The study found that non-performing loans in Tanzanian commercial banks is on the decrease since 2017 yet the rate is not impressive as it is above the required NPL ratio of 5 percent. Inferentially, the non-performing loans were not significantly associated with either ROA or ROE. However, the insignificant relationships between non-performing loans and ROE and ROA were negative. These results have little evidence to support information asymmetry theory and modern portfolio theory, which argue, adverse selection and moral hazard increased exposure to credit risk measured by NPLs is normally associated with an increase in operating costs and lead to decreased profitability of banking.

Therefore, the results of this study leave several implications for researchers, practitioners, policymakers, and regulators. For practitioners, bank managers need to thoroughly scrutinize

borrowers' reference and information during the credit analysis stage to reduce information asymmetry and hence the risk of default which increases NPLs. Accordingly, banks need to put in strong credit information systems which will help them to fill the informational gaps and increase access to complete, accurate and reliable information concerning borrowers. Also, the study has contributed to a practical and scientific approach that will help advance research in credit risk management, bank profitability, and bank stability in the future.

To policymakers, the government through the bank of Tanzania will use the findings of the current study in determining policy decisions geared to reducing asymmetry in the information needed to access financial services providers as well as assess the borrowers. Besides, the banks' management can make use of these findings to formulate policies that can best increase credit risk management and simultaneously increase bank profitability. Furthermore, a policy should emphasize that financial reports to have information that can support produce quality research output. So, the publicity and ease of access to such information can assist the government and commercial banks in receiving feedback output supported by empirical evidence for policy formulation and implementation.

The regulators, on the other hand, need to install the early warning indicator system to monitor the accumulation of NPLs in the banking industry to avoid any financial crisis triggered by the presence of NPLs. To researchers, this study sets a leap in studying credit risk management in all commercial banks in Tanzania where the focus of most studies has been on microfinance institutions or case studies on specific banks. Also, the study has contributed to a practical and scientific approach that will help advance research in credit risk management, bank profitability, and bank stability in the future.

REFERENCE

Kingu, P.S., Macha, D.S. &Gwahula, D.R. (2018), Impact of Non-Performing Loans on Bank's Profitability: Empirical Evidence from Commercial Banks in Tanzania. International Journal of Scientific Research and management, Volume 6 Issue 1, pp (71-78).

Lata, R. S. (2015), "Non-Performing Loan and Profitability: The Case of State-Owned Commercial Banks in Bangladesh", World Review of Business Research, Volume 6 Issue 3, pp (171-182).

Adebisi, J.F. &Matthew, O.B. (2015), "The Impact of Non-Performing Loans on Firm Profitability: A Focus on the Nigerian Banking Industry", American Research Journal of Business and Management, Volume1, Issue 4, pp (1-7)

Bashir, A., 2000. Assessing the performance of Islamic banks: Some evidence from the Middle East. Paper Presented at the ERF 8th Meeting in Jordan

IMF, 2009.Lessons of the global crisis for macroeconomic policy. IMF Staff Paper No. 09/37. Washington, DC: International Monetary Fund.

Lelisa, T.B., 2014. The determinants of Ethiopian commercial bank's performance.European Journal of Business and Management, 6(14).

Margrabe, W. (2007).Credit risk management of the commercial loan portfolio.

Richard, E. (2011). Factors That Cause Non– Performing Loans in Commercial Banks in Tanzania and Strategies to Resolve Them. Journal of Management Policy and Practice

Karim, M. Z. A., Chan, C. S., and Hassan, S. (2010). Bank Efficiency and Non-Performing Loans: Evidence from Malaysia and Singapore. Prague Economic Papers, 2, 2010

Kaaya, A. and Pastory, D (2013). Credit Risk and Commercial Banks Performance in Tanzania: a Panel Data Analysis. Research Journal of Finance and Accounting.ISSN 2222-1697 (Paper) ISSN 2222-2847, Vol.4, No.16 2013.

Talata, N.,(2015), The Effect Of Non-Performing Loans On The Financial Performance Of Selected Rural Banks In The Western And Ashanti Regions Of Ghana, MBA thesis, BA.Publishing Studies.

Kozaric, K. and Zunic, E. (2015) "Causes and Consequences of NPLs in Bosnia and Herzegovina Banking Sector".Journal of Economic and Social Studies, Vol 5, No. 1.

Nikolov and Popovska–Kammnar (2016) "Determinants of NPL growth in Macedonia". Journal of Contemporary Economic and Business Issues, Vol. 3 No. 2, pp. 5-18.

Ebba, M. K. (2016). The relationship between non-performing loans and financial Performance of commercial banks in Ethiopia.Unpublished Master's Thesis. University of Nairobi, Kenya.

Bhattarai, Y. R. (2016). Effect of Non-Performing Loan on the Profitability of Commercial Banks in Nepal. The International Journal Of Business & Management, 4(6), 435-442

Ozurumba, B. A. (2016). Impact of Non-Performing Loans on the Performance of Selected Commercial Banks in Nigeria. Research Journal of Finance and Accounting, 7(16), 95-109. Retrieved from http://www.iiste.org/Journals/index.php/RJFA/article/viewFile/32749/33

Saunders, M., Lewis, P., and Thornhill, A. (2009) Research Methods for Business Students. Pearson, New York.

Greuning H.V and Bratonovic, S.B (2000) Analysing banking risky: Framework for assessing Corporate governance and financial risk management.USA; The world bank

Kothari, C. R., &Garg, G. (2014).Research methodology methods and techniques (3rded.). New Delhi: New Age International (P) Ltd.