



## FACTORS INFLUENCING PROFITABILITY OF COMMERCIAL BANKS IN TANZANIA: A CASE STUDY OF CRDB BANK PLC

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### ABSTRACT

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This study examines factors influencing profitability of commercial banks in Tanzania. This study uses the CRDB Bank Plc. as a case study to investigate the bank specific factors and macroeconomic factors on bank profitability. The study uses correlational research design to examine the bank-specific factors and macroeconomic factors on profitability. Time series data for the period spanning from 2008 to 2019 were used. The results indicate that bank-specific factors such as bank deposit, non-performing loans and bank expense are statistically significant on bank profitability. On the other hand, macroeconomic factors were found to be insignificant on bank profitability. The implication for this study is that commercial banks policies should be geared towards bank-specific factors in enhancing profitability rather than concentrating on macroeconomic factors which does contribute to bank's profitability. The bank deposits mobilized should be used effectively in realizing profitability. In addition, bank expenses should be cost effective in order to enhance bank profitability.

**Contribution/Originality:** The study contributes to the existing literature on the factors that contributes to profitability in the commercial bank sector using correlational research design within a time series data spanning a period from 2008 to 2019. The paper contributes that -specific factors such as bank deposit, non-performing loans and bank expense are statistically significant to bank profitability and bank deposits be mobilized effectively to realize profitability.

### 1. INTRODUCTION

Banks play an important role in the financial system. The economic growth of any country depends on the banking sector to exert impact on the economy due to their crucial role (Mbekomize & Mapharing, 2017). Apart from lending and safekeeping of depositor's money, commercial banks also act as a medium of transfer of funds between customers which is also known as payment function (Brian, 2012).

In early 2018, some banks failed to stand alone and were forced to merge with other banks, as they have succumbed to liquidity problems and losses. According to IMF (2018) among the factors that contributed to the poor performance of banks and other financial sector is an increase in non-performing loans (NPL) ratio. Bank managers, depositors, investors, shareholders and government should be aware of the factors that influencing profitability of banks so as to avoid bank failures and be able to make good investment decisions.

Many studies were conducted on profitability of commercial banks in the Sub-saharan region (Kiganda, 2014; Mbekomize & Mapharing, 2017; Yakubu, 2016) and Tanzania in particular (Ally, 2014; Kingu, Macha, & Gwahula, 2017; Lotto, 2019) but of interest is the suggestion by Ally (2014) for future studies to widely cover longer time

period in their studies. The study by Ally (2014) minimally covered a time series of 5 years. This study covers longer period of 10 years and within these 10 years, the government has changed some of the policies like Statutory Minimum Reserve (SMR) requirement which increased from 8% to 10% in 2015 (Bank of Tanzania, 2015) the introduction of International Financial Reporting Standards (IFRS 9) and Bancassurance guidelines for all banks and financial institutions in Tanzania (Bank of Tanzania, 2019). Several local banks incurred heavy losses during this period, In 2017, National Microfinance Bank (NMB) reported a profit of Tshs 93.561 billion which is less than Tshs 153.779 billion of 2016 (NMB, 2017). CRDB Bank reported a profit of Tshs 46.44 billion in 2017 differing from 2016 profit margin of Tshs 66.62 billion (CRDB, 2017). Mwalimu Commercial Bank (MCB) registered cumulatively a loss of Tshs 729 million in 2016 and Tshs 4.27 billion in 2017 (Mwalimu Commercial Bank, 2017). This is why the current study has extended the time series data from 2008 to 2019 to establish the relationship that exists between bank-specific, macroeconomic factors and profitability (ROA) so as to adequately redress the impinging factors that determines bank profitability.

### 1.1. Objectives

The main objective of this study was to examine the factors influencing the profitability of commercial banks in Tanzania.

### 1.2. Hypothesis

This study was guided by the following hypothesis: -

*Ho: Real interest rate cannot influence Commercial Bank's profitability in Tanzania.*

*Ho: Inflation cannot influence Commercial Bank's profitability in Tanzania.*

*Ho: Bank deposits cannot predict Commercial Bank's profitability in Tanzania.*

*Ho: Bank expenses cannot predict Commercial Bank's profitability in Tanzania.*

*Ho: Non-performing loans cannot predict Commercial Bank's profitability in Tanzania.*

### 1.3. Scope

This study covered CRDB Bank which represented other commercial Banks in Tanzania because it is a big bank and it was easy to obtain its data.

### 1.4. Significance of the Study

This study will help bank managers to know which variables to concentrate on in order to reduce losses which may occur, Investors and depositors will use the study to know which variables they can use during the analysis of the bank before making investment decisions, also the study will add knowledge to scholars and researchers, the study will also assist the government in policy making, the employees will also know which variables to concentrate on in order to make profit.

## 2. LITERATURE REVIEW

This study was supported by three theories which are Structure Conduct Performance (SCP) which was first published by Edward Chamberlin and Joan Robinson in 1933 (Faccarello & Kurz, 2016) and developed by Bain (1951). The Structure conduct performance paradigm assumes that a higher bank concentration allows a higher degree of cooperation (Bain, 1951) this may cause them to set higher prices and able to gain higher profits, another theory is Efficiency structure hypothesis (ESH), This hypothesis suggests that a bank may have low operational costs which result from operating more efficiently than its competitors (Demsetz, 1973). This means that the low costs incurred by the bank can lead to an increase in the profitability of that bank. According to the efficiency structure hypothesis, the performance (profitability) of the bank is positively related to the efficiency of that bank

(Edwards, Allen, & Shaik, 2006). As the efficiency of the bank increases, the operational costs decreases which in turn lead to the increases in the profitability of commercial banks. According to Edwards, Allen, & Shaik (2006), when a firm operates efficiently it will be able to charge lower prices and capture the large market share which in turn will lead to the increase in sales and profits. Another theory is that of Asymmetric information that was developed by Goerge Akerlof, Michael Spence and Joseph Stiglitz in 1970s. According to this theory, information asymmetry occurs when one party is well informed than the other party in the transactional relationship. When there is informational asymmetry, it becomes difficult for the lenders to distinguish between good borrowers and potential defaulters (Auronen, 2003) and this can lead to the increases in Non-performing loans (Kingu et al., 2017).

Empirical studies in determinants of profitability of commercial banks are immense but of interest to our study is the one conducted by Ally (2014) who concluded that profitability cannot be impacted by macroeconomic factors but can be influenced by bank-specific factors. This means that banks should concentrate more on cost reduction, maintaining of quality loans, and should not put more emphasis on macroeconomic factors as they do not impact profitability. Javed and Basheer (2017) used 5 variables in their studies of 10 commercial banks in Pakistan. They concluded in their findings that a direct relationship exists between ROA, Growth Domestic Product (GDP), Market concentration and Bank expenses. However, according to Efficiency Structure Hypothesis (ESH), the relationship between Profitability and Expenses should be negative. Different results about the determinants of profitability of commercial banks are noted in literature. Some results showed the positive relationship between profitability and inflation (Alexiou & Sofoklis, 2009) while others are showing the negative relationship between profitability and inflation (Duraj & Moci, 2015; Yakubu, 2016). Interestingly, a study by Ally (2014) concluded that an insignificant relationship exists between inflation and profitability. Another study has indicated a positive relationship between profitability (ROA) and bank deposits (Menicucci & Paolucci, 2016) while (Soyemi, Akinpelu, & Ogunleye, 2013) concludes that an insignificant relationship exists between profitability (ROA) and bank deposits. In the study by Javed and Basheer (2017) a positive relationship between profitability and bank expenses was highlighted, but the higher expenses are expected to decrease profitability (Edwards et al., 2006).

The noted ambiguity results obtained by different researchers necessitates for further research to be conducted especially in Tanzania where the performance of banking sector was not good in 2017 (Bank of Tanzania, 2018). This study was expected to provide a clear picture about the relationship that exists between Profitability (ROA), bank deposits, bank operating expenses, non-performing loans, real interest rates and inflation.

### 2.1. Methodology and Data

This study uses time series data covering the period from 2008 to 2019. Data of bank operating expenses, bank deposits and non-performing loans were extracted from CRDB Bank financial statements and annual reports. Data on inflation and real interest rate were obtained from the World bank database for the period covering 2008 and 2019. The relationship between profitability (ROA) and real interest rate, Inflation, Bank deposits, Bank operating expenses and non-performing loans were regressed by using linear regression model where the dependent variable was profitability (ROA) and independent variables used were real interest rate, inflation, bank deposits, bank operating expenses and non-performing loans. The data were analyzed using STATA 13 software.

The regression model below was adopted: -

$$ROA_t = \gamma_0 + \gamma_1 ddep + \gamma_2 doper + \gamma_3 dnonpl + \gamma_4 dinter + \gamma_5 dinf + \mu$$

Where: -

$$ROA = \text{Return on Assets} = \frac{\text{Net Income}}{\text{Average Total Assets}}$$

dinter = Real interest rate

$$dinf = \text{inflation} = \frac{CPI_{X+1} - CPI_X}{CPI_X}$$

ddep =log of Bank deposits.

doper =Bank operating expenses= $\frac{\text{Non-interest expenses}}{\text{Gross income}}$

dnonpl =Non-performing loans= $\frac{\text{Non-performing loans}}{\text{Gross loans}}$

$\gamma_0$ -Intercept (Constant term)

$\gamma_1, \gamma_2, \gamma_3, \gamma_4$  and  $\gamma_5$ , are regression coefficients.

$\mu$ -error term.

$CPI_{X+1}$  - Consumer Price Index of next year.

$CPI_X$  – Consumer Price Index of initial year.

### 2.2. Data Analysis Methods

The data collected were checked for stationarity using Phillips-Perron test and Augmented Dickey-Fuller Tests and the differentiation method was applied to make non stationary variables stationary, the data which were found to be not stationary were bank deposits, bank operating expenses, inflation and real interest rate and the first differentiation was applied which made them stationary, then STATA 13 software was used to analyse the data to determine the relationship that exists between dependent variable which is profitability (ROA) and independent variables, then the researcher conducted the diagnostic checking to detect whether residuals are normally distributed using Shapiro Wilk test, also if there is autocorrelation using Durbin Watson Test, The detection of whether the residuals are Heterodescasticity, Breusch Pagan test was conducted.

## 3. FINDINGS/RESULTS

### 3.1. Unit Root Test

Before proceeding with the analysis of the data, the stationarity of the data was checked, to determine whether the variables are stationary at levels, at first differentiation or not. The unit root test was conducted to determine if the variables have unit root or not. In order to validate the findings, the researcher applied the Augmented Dickey-Fuller and Phillips-Perron tests and the results are shown on Table 1 and Table 2 respectively.

The hypothesis for the Unit root test are as follows: -

$H_0$ : The variable has a unit root.

$H_1$ : The variable is stationary.

Table-1. Unit Root Tests Results-Augmented Dickey Fuller (ADF).

Lag difference=0	Levels			First Difference, d		
	Constant	Constant and Trend	No Constant and No Trend	Constant	Constant and Trend	No Constant and No Trend
Dep	22.491	62.806	0.901	62.087	53.959	51.663
Oper	1.886	2.396	0.691	3.587	4.027	3.348
Nonpl	3.037	2.950	0.993	4.762	4.677	5.020
Inter	1.636	1.082	0.032	3.267	3.759	3.261
Inf	1.527	2.850	1.130	5.929	5.606	6.248
5% critical value	3.000	3.600	1.950	3.000	3.600	1.950

The Table 1 and Table 2 presented the results of unit root tests using Augmented Dickey Fuller and Phillips Peron respectively and the results show that the independent variables (Bank deposits, non-performing loans, bank operating expenses, inflation and real interest rates) have unit roots at levels and concluded that they are not

stationary at levels, but they were stationary at first difference. This is because the t-statistics of the independent variables (Bank deposits, non-performing loans, bank operating expenses, inflation and real interest rates) are greater than the critical values at 5% level of significance.

Table-2. Unit Root Tests results- Phillips-Perron (PP).

Lag difference=1	Levels			First Difference, d		
	Constant	Constant and Trend	No Constant and No Trend	Constant	Constant and Trend	No Constant and No Trend
Dep	15.896	60.209	0.911	74.457	73.906	40.848
Oper	1.930	2.204	1.081	3.624	4.133	3.355
Nonpl	3.039	2.887	0.847	5.064	5.157	5.362
Inter	1.626	1.008	0.004	3.271	3.998	3.268
Inf	1.384	2.841	1.132	6.831	6.413	7.218
5% critical value	3.000	3.600	1.950	3.000	3.600	1.950

### 3.2. Regression Results

The Table 3 shows the results of the study conducted by the researcher the independent and dependent (ROA) variables are shown on the table, the table also shows the t-statistics, p-values, F-statistic, probabilities, adjusted R-squared as well as R-squared. The level of significance used in this study was 5% which were used in the interpretation of the study.

Table-3. Regression Results.

Variable	Coefficient	Std. error	t-stat	Probability
Ddep	-0.7279647	0.217233	-3.35	0.015
Doper	-0.0901242	0.034086	-2.64	0.038
Dnonpl	-0.1458922	0.053866	-2.71	0.035
Dinter	-0.0818524	0.107414	-0.76	0.475
Dinf	-0.0812804	0.082521	-0.98	0.363
Constant	3.587726	0.501528	7.15	0.000
R <sup>2</sup>	0.8621			
Adjusted R <sup>2</sup>	0.7472			
Prob(F-stat)	0.0146			
F-statistic	7.50			

### 3.3. Regression Analysis

The test was conducted using time series data from 2008 to 2019 and STATA 13 software was used and the results obtained are shown on the Table 3, the relationship between Bank deposits, Bank operating expenses, Non-performing loans, Real interest rates, Inflation and Profitability (ROA) is explained by the regression equation below: -

$$ROA = 3.587726 - 0.7279647ddep - 0.0901242doper - 0.1458922dnonpl$$

Where **ddep**= Bank deposits.

doper= Bank operating expenses.

dnonpl= Non-performing loans.

dinter= Real interest rates.

To determine if there is model specification bias a Ramsey RESET test was conducted and the results found that the model has no omitted variables because the p-value was 0.9909 which is greater than 5% level of significance, and concluded that there is no problem of model specification bias.

### 3.4. Value of Adjusted R<sup>2</sup>

The value of adjusted R<sup>2</sup> is 74.72%, This means 74.72% variation in Profitability of CRDB Bank is explained by Deposits, Bank operating expenses, Non-performing loans, Interest rates and Inflation while the remaining 25.28% is not explained by the model. This means the model is valid and useful for the prediction.

### 3.5. Significance of Bank-Specific Factors

The variables Bank deposits, Bank operating expenses and Non-performing loans were found to be significant and have a negative relationship with profitability, their coefficients were  $-0.7279648$ ,  $-0.0901242$  and  $-0.1458922$  respectively and the p-values were 1.5% for bank deposits, 3.8% for bank operating expenses and 3.5% for non-performing loans and these are less than 5% level of significance and we conclude that Bank-specific factors can predict commercial bank profitability.

### 3.6. Decision on General Results Based on P-Values and F-Statistic

Based on the results shown in Table 3 the p-value of the F-statistic is 0.0146 (1.46%) which is less than 5% level of significance and this showed that the model is good for prediction, Also based on the results we reject the null hypothesis 3, 4 and 5 ( $H_{0_3}$ ,  $H_{0_4}$ ,  $H_{0_5}$ ) because bank-specific factors have a p-values of less than 5% level of significance and conclude that Bank-specific factors (Non-performing loans, Real interest rates, Bank deposits and Bank operating expenses) can predict Commercial Bank's profitability in Tanzania and also we fail to reject the Null hypothesis 1 and 2 ( $H_{0_1}$  and  $H_{0_2}$ ) because the p-values of Macroeconomic factors are greater than 5% level of significance and conclude that Macroeconomic factors (Real interest rate and Inflation) cannot jointly influence Commercial Bank's profitability in Tanzania.

### 3.7. Diagnostic Checking

#### 3.7.1. Normality Test

To determine whether the residuals are normally distributed the Shapiro Wilk test was conducted by the researcher, the researcher created a variable U to represent the residuals and the hypothesis for the normality test are as follows: -

$H_0$ : Residual is normally distributed.

$H_1$ : Residual is not normally distributed.

### 3.8. Decision Criteria

The null hypothesis is not rejected if the p-value is greater than 5% level of significance and rejected if the p-value is less than 5% level of significance, the Shapiro Wilk test results are shown in the Table 4.

Table-4. Shapiro wilk test results.

ROA		
Variable	Observation	Probability
Residual	12	0.59283

Table 4 shows the normality test results using Shapiro Wilk test and the p-value is 59.28% and this is greater than 5% level of significance, therefore we failed to reject the null hypothesis and concluded that the residuals are normally distributed.

#### 3.8.1. Test for Heteroscedasticity

The researcher used the Breusch-Pagan test to test for heteroscedasticity and the results of the test are shown in the Table 5, the following hypothesis were used for the test: -

$H_0$ : The Residual is homoscedasticity.

$H_1$ : The Residual is heteroscedasticity

### 3.9. Decision Criteria

The null hypothesis is not rejected if the p-value is greater than 5% level of significance and rejected if the p-value is less than 5% level of confidence, this is the decision criteria for the mentioned hypothesis above and the results are shown in the Table 5.

Table-5. Breusch-pagan test results.

ROA	
Chi <sup>2</sup>	0.24
Prob>chi <sup>2</sup>	0.6211

According to the results shown in the Table 5 the p-value is 0.6211 (62.11%) and this is greater than 5% level of significance and then we failed to reject the null hypothesis and concluded that the residuals are homodescasticity and this means there was no problem of heterodescasticity.

### 3.10. Test for Serial Correlation

The researcher used the Durbin Watson test to determine if there is a problem of serial correlation and the following hypothesis was applied: -

*H<sub>0</sub>: The residuals are not serially correlated.*

*H<sub>1</sub>: The residuals are serially correlated.*

### 3.11. Decision Criteria

The null hypothesis is not rejected if the p-value is greater than 5% level of significance and rejected if the p-value is less than 5% level of confidence, this is the decision criteria for the mentioned hypothesis above, the time series data from 2008 to 2019 was declared first by the researcher and the results are shown in the Table 6.

Table-6. Durbin Watson test results.

ROA	
Chi <sup>2</sup>	0.482
Prob>chi <sup>2</sup>	0.4868

The results in Table 6 shows that the p-value is 0.4868 (48.68%) which is greater than 5% level of significance and the null hypothesis was not rejected and the researcher concluded that there was no serial correlation problem.

## 4. DISCUSSION OF THE FINDINGS

Based on the results obtained in Table 5, the bank-specific variables which included bank deposits, bank operating expenses and non-performing loans were found to be significant and negatively related with the profitability(ROA), this means that when the Bank deposits, Bank operating expenses and Non-performing loans increases, the bank profitability (ROA) will decreases and when the Bank deposits, Bank operating expenses and Non-performing loans decreases, the bank profitability (ROA) increases.

It was also found that the macroeconomic factors are insignificant, this means they cannot influence profitability of commercial banks in Tanzania, they have a p-value of greater than 5% level of significance.

## 5. CONCLUSIONS

The main objective of the study was to examine the factors influencing the profitability of commercial banks in Tanzania and five variables were used which includes bank deposits, bank operating expenses, non-performing loans, inflation and bank real interest rates for the period of 12 years from 2009-2019. On the results summarized in Table 5 showed that inflation and real interest rates seems not to influence the profitability of CRDB Bank because

they are not significant to explain the model. They have a p-value of greater than 5% level of significance and t-statistic of less than 2 in absolute while the bank deposits, bank operating expenses and non-performing loans are significant to explain about the model because they have a p-value of less than 5% level of significance and t-statistic of greater than 2 in absolute. Hence they can influence the profitability of CRDB Bank. Therefore, the null hypothesis 3, 4 and 5 ( $H_{03}$ ,  $H_{04}$  and  $H_{05}$ ) are rejected and thus we conclude that Bank-specific factors (non-performing loans, bank deposits and bank operating expenses) can predict Commercial Bank's profitability in Tanzania. We, however, failed to reject the Null hypothesis 1 and 2 ( $H_{01}$  and  $H_{02}$ ) since the macroeconomic factors such as real interest rate and inflation cannot influence Commercial Bank's profitability in Tanzania. The results of this study agree with earlier findings of Ally (2014) who concluded that macroeconomic factors (inflation and real interest rates) cannot affect the bank's profitability in Tanzania. Similarly this study concurs with findings of Yakubu (2016) and Kiganda (2014) who noted that bank-specific factors can influence bank profitability but macroeconomic factors (inflation and real interest rates) cannot influence bank's profitability. The p-value of the F-statistic is 0.0146 (1.46%) which is less than 5% level of significance and this showed that the adopted model is good for prediction. Several tests were conducted to attest the validity of the model, Shapiro Wilk test was used to test for the normality of residuals, Breusch-Pagan test was used to test for Heteroscedasticity and Durbin Watson was used to measure the autocorrelation and all these tests confirmed the validity of the model. Therefore, the profitability of commercial banks in Tanzania is influenced by bank deposits, bank operating expenses and non-performing loans and also the results of this study also showed that inflation and real interest rates cannot influence the bank's profitability in Tanzania.

## 6. RECOMMENDATIONS

Based on the results of this study, we recommend that bank managers should put more emphasis on bank-specific factors (bank operating expenses, bank deposits and non-performing loans). Study also recommends that bank managers should make sure that the deposits mobilized is used effectively to provide loans to the borrowers in order to maximize the income from loans. They should also concentrate on mobilizing cheap deposits from CASA (Current and Savings) deposits, minimize the non-performing loans and ensure they reduce the expensive deposits which tend to attract high interest rates. Furthermore, the Government should avoid creation of stringent policies that strictly impinge both banks and customers. In order to motivate growth of businesses, the National Trade policy should be implemented to motivate customers to use bank's products like loans, deposits and alternative banking channels and this will help banks to increase interest, non-interest income and reduce the non-performing loans. Bank of Tanzania (BOT) should introduce an accommodative monetary policy to ease the lending and discount rates thus eventually boost private sector's credit growth.

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