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RESEARCH ARTICLE

HOW MACROECONOMIC VARIABLES AFFECT BANKS' PERFORMANCE IN TANZANIA

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ABSTRACT

Background: Banking sector plays an important role in stimulating the economy of the country especially where the capital market of that country is infant. According to Rousseau and Sylla (2001), security markets with good performance encourage the country's economic growth. Due to that fact, commercial banks have to evaluate whether their performance is stable or it is just for the short run. In this case, both external and internal factors are to be scrutinized due to their effect on the banks' performance. However, few studies have done on the impact of external forces affecting the banks' performance. With this regard, banks have to examine the factors surrounding the business environment mainly the external forces we now call macroeconomic variables such as the inflation rates, exchange rate, government debts, interest rates and the rate of growth of GDP. Our study aims on assessing the impact of macroeconomic variables proxied by Exchange rate, Inflation rate, Interest Rate, money supply, government debts, and GDP growth rate; on performance of Tanzanian banking sector from 2011 to 2019. **Materials and Methods:** The study uses secondary data collected from central bank of Tanzania, Tanzania bureau of Statistics, and World Bank databases. In data analysis, the study employs correlation and multiple regression analysis using Pooled Ordinary Least Square Regression Model. **Results:** The results show that, GDP growth rate has an insignificant positive relationship with Banks performance, while the Interest Rate has a negative and insignificant impact on banks performance. The Inflation rate has a negative and insignificant effect on bank performance at 10% level of significance. Furthermore, the results indicate that the exchange rate has an insignificant negative effect on bank performance at 10% level of significance. **Conclusion:** Economic regulators and policy makers have to concentrate on adjustment of external factors like inflation, exchange rates, interest rates, government debts, and GDP which found to have impacts on banks' performance, while improving the capital market operations in the country.

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INTRODUCTION

Banking sector in Tanzania plays a big role in the economic development. This is due to the performance of the capital market which does not fulfill the need. Investors could get their capital from the capital market, which is contrary to Tanzania context that, currently, there are only 27 firms listed in the Dar es salaam stock exchange all over the country. When the 27 firm have their source of capital at DSE, other investors (firms) in Tanzania have no sources other than financial institutions like banks. Regardless the expensiveness of short term loans, the investors use them for their fulfillments. Sometimes banking sector due to the risk attached to their roles, meets the nonperforming loans as a stumbling block to their performance. Nonperforming loans disturb the banks' liquidity and performance.

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However, investors and other customers still use banks as their intermediaries in various business activities. According to Rousseau and Sylla (2001), security markets with good performance encourage the country's economic growth. Due to the infancy of the capital market in Tanzania, the banks as the investors' resort would be protected from the other external factors that could harm the liquidity and profitability. The factors are known as macroeconomic factors or forces. Among others are inflation, exchange rate fluctuation, interest rates, government debts, and the growth rate of gross domestic product. These forces are beyond the banking sectors' capacity. Although they are beyond the banks capacity, they affect the banks performance. Example interest rate is used by the government as the open market operation tool for redressing the economy whenever the needs arise ie. during the (boom) inflation, the government employ them to play the contractionary role to cure the economy, and also during the recession, the government employs the factors to play expansionary role to redress the economy.

Whether boom or recession, the big deal is the effect of employing the factors. When the economy experience expected boom, the banks enjoy seeing their borrowed fund being serviced, and that no bad loans to harm their goals, but when happen the unexpected boom, it disturbs demand and supply due to rising of the price of all the goods and services that increase the overheads which reduces the profitability of banks. Apart from that, the problems comes when the government employs the monetary policy and fiscal policy variables such as rising the interest rates, reduce the government spending, discourage loans, and the use of other tools to reduce money supply in the economy.

With all the above experiences, it is still unknown whether the variables affect the banks' performance negatively, positively, or they have no effect. This is the essence of this research. This research is to study on how macroeconomic variables affect banks' performance in Tanzania. The remaining paper is divided as follows; Section 2 reviews the literature and develop hypothesis, Section 3 defines the data, and methodology. Section 4 presents the Results, Section 5, discussion of findings, Finally, Section 6, conclude the research.

Literature Review and Development of Hypothesis: Many studies use ROA as performance measure (Athanasoglou, P. P., Delis, M. D., & Staikouras, C. K. (2006); Hassan & Bashir, 2003). In their study Demirgüç-Kunt and Detragiache (1998), employing multivariate logit model to analyze developed and developing economies found significant impact of macroeconomic variables toward banking sector performance. However, the relationships have mixed results. Emase, M. A. (2017), conducted a research on the effect of macroeconomic factors on bank profitability for 11 listed banks in the NSE using Panel data regression analysis with fixed effects, reports the positive and significant effect between GDP and banks' performance.

The finding was supported by Maysa'a Munir MILHEM, Ibrahim Abed Alhaleem ABADEH, (2018), in their research, assessing the impact of macroeconomic determinants on banks' profitability and liquidity in Jordan for the period 2005-2015, employing panel data Regression analysis, found positive and significant relationship between GDP growth rate and banks' performance.

However, Tahsin Karabulut , Gülşah Şen (2018), investigating macroeconomic indicators that affect international financial centers' performance, employing panel data analysis method and found the negative and significant effect between GDP and banks' performance. Not only that, but also Konadu, K. A., (2016), assessing the impact of macroeconomic variables on profitability of public limited commercial banks in Ghana for the period 1980-2014 employing Autoregressive Distributed Lag (ARDL) estimation technique found the negative and significant effect between GDP and banks' performance.

However, in our view, GDP has positive effects on the banks' performance due to the fact that, when the economy meet the favorable economic condition the financial transactions will be redressed and majority of borrowers are able to service their loans and that, the banks get their expectations (Sufian and Habibullah 2010). Supporting to the above, (Demirguc-Kunt & Huizinga, 1999) asserts that, the fast growing economy supports the banks performance.

H_1: GDP has positive impact on banks' performance

Furthermore, Sangeetha R, Moorarka Chinu (2019) researching the impact of macroeconomic variables on the profitability of Indian Commercial Banks listed in NIFTY, employing Correlation and Multiple Regression Analysis along with descriptive statistics and found the positive and significant effect between Inflation and banks' performance. Also, Emase, M. A. (2017), conducted a research on the effect of macroeconomic factors on bank profitability for 11 listed banks in the NSE using Panel data regression analysis with fixed effects, and found the positive and significant effect between Inflation and banks' performance. The results were supported by Maysa'a Munir MILHEM, Ibrahim Abed Alhaleem ABADEH, (2018) in their study assessing the impact of macroeconomic determinants on banks' profitability and liquidity in Jordan for the period 2005-2015 employing panel data Regression analysis, found positive and significant relationship between Inflation rate and banks' performance. Nevertheless, Tahsin Karabulut, Gülşah Şen (2018), investigating macroeconomic indicators that affect international financial centers' performance, employing panel data analysis method and found the negative and significant effect between inflation and banks' performance; while Sanusi, M., Zulaikha, S. (2019), investigating the impact of bank-specific and macroeconomic variables on the profitability of Islamic rural bank (BPRS) in Indonesia from January 2010 to December 2018 using vector error correction model and found the negative and insignificant relationship between inflation and banks' performance.

Perry (1992) asserts that, inflation may have positive or negative influence on profitability subject to whether it is anticipated or unanticipated. Bashir 2003, and Demirguc-Kunt and Huizinga 1999 denote that, banks generate high profits during an anticipated boom when they charge high interest rates on loans; and if the inflation is unanticipated one, banks fail to adjust the rates timely, while having general price risen which ends to low profits and sometimes get loss. For the case of Tanzania, the economy with infant financial markets faces unanticipated inflation that ends to negative effects, so, our hypothesis will be:

H_2: Inflation Rate has Negative impact on Banks' Performance.

Moreover, Emase, M. A. (2017), conducted a research on the effect of macroeconomic factors on bank profitability for 11 listed banks in the NSE using Panel data regression analysis with fixed effects, and found the positive and significant effect between interest rate and banks' performance. The results supported by Konadu, K. A., (2016), and Kanwal, S., Nadeem, M., (2013), assessing the impact of macroeconomic variables on profitability of public limited commercial banks in Pakistan for the period 2001-2011empolying Pooled Ordinary Least Square (POLS) method found positive and significant effect between interest rate and banks' performance; while Sangeetha R, Moorarka Chinu (2019) researching the impact of macroeconomic variables on the profitability of Indian Commercial Banks listed in NIFTY, employing Correlation and Multiple Regression Analysis along with descriptive statistics, found positive and insignificant effect between Interest rate and banks' performance. Nonetheless, Sangeetha R, Moorarka Chinu (2019) researching the impact of macroeconomic variables on the profitability of Indian

Commercial Banks listed in NIFTY, employing Correlation and Multiple Regression Analysis along with descriptive statistics, found negative and significant effect between interest rate and banks' performance. This result was supported by Hamid, K., Ghosh, R. (2019) in their study investigating the impact of firms' Specific attributes and macroeconomic conditions on profitability of banks listed in Dhaka Stock Exchange for the period 2004 to 2015, employing Pooled, fixed-effect, and random-effect regressions, found negative and significant effect between interest rate and banks' performance. In our view, interest rate disables the bank customers on servicing their loans and so it cause nonperforming loans that disturbs the liquidity and profitability, and so, the interest rates have negative effects on bank performance.

H_3: Interest rates have Negative Impact on Banks' Performance.

Regarding the exchange rate, Konadu, K. A., (2016), assessing the impact of macroeconomic variables on profitability of public limited commercial banks in Ghana for the period 1980-2014 employing Autoregressive Distributed Lag (ARDL) estimation technique found the positive and significant effect between exchange rate and banks' performance. However, Emase, M. A. (2017), conducted a research on the effect of macroeconomic factors on bank profitability for 11 listed banks in the NSE using Panel data regression analysis with fixed effects, and found the negative and significant effect between exchange rate and banks' performance.

H_4: Exchange Rate has Negative Effect on Banks' Performance.

Government debts as one of macroeconomic factors have impact on the banks' performance, the impact of which depend to the countries' economic status (Panagiotis Pegkas, 2018). For the developed economy it does not harm much, but for developing countries, the effect is harmful. This is due to the result of the use of debts, is it for development or for recurrent use? The answer of which can determine whether the debt can benefit the economy or not.

In the long run, debt holders charge high interest due to the debt to GDP ratio increases to the extent of claiming the compensation for the marginal risk they won't be repaid. This increase on interest rates results to slow the economic growth. Supporting the above notion, Eze, Onyebuchi Michael; Nweke, Abraham Mbam, and Atuma Emeka (2019) assert that, the government debt has negative effect on the economic performance.

H_5: Government Debt has Negative Effect on Banks' Performance.

MATERIALS AND METHODS

Data Source: Regarding macroeconomic variables the data have been obtained from the central bank of Tanzania, Tanzania bureau of statistics, and World Bank's database. For the empirical analysis six variables have been included in this research, out of them, ROA is dependent variable and other five variables (GDP, Inflation rate, Interest rate, Exchange rate, and government debts) are independent variables.

Model Development: The majority of studies support the regression model to estimate the effect of different factors on the profitability (Singh Kumar Rajesh & Chaudary Sakshi. (2009); Fadzlan & Habibuhhal, 2009; Panayiotis, Sophocles & Matthaios, 2008; Deger & Adem, 2011; Andreas & Gabrielle, 2011). Therefore the following model for Banks' performance is provided in the following equation:

$$ROA = \beta_0 + \beta_1 GDP + \beta_2 INFR + \beta_3 INTR + \beta_4 EXCR + \beta_5 DEBTR + \mu_t$$

Where;

ROA = Return on Assets
GDP = Gross Domestic Product
INFR = Inflation rate
INTR = interest rate
EXCR = Exchange Rate
DEBTR = Money Supply
μ_t = Random Error
β_0 = The intercept of the equation
β_n = The change coefficient for independent variables
t = Time

Measurement of Variables

Dependent Variable – Performance Measure: The research by Rao & Lakew, (2012) captured from Guru *et al*., (1999) that it is a good practice to use ratios to measure the banks' performance rather than using the values due to the fact that, ratios are not affected by inflationary pressure. In this context, our study use Return on Assets as the dependent variable. Return on Assets (ROA) explains on how the bank managers are effective in using assets efficiently to earn the return (Davydenko, 2011).

Independent Variables - Macroeconomic Variables: Macroeconomic variables are country wide factors that are beyond the company ability that prevail in the economy where the commercial banks operate (Ongore, 2013). The following are independent variables.

GDP Growth (Annual %): GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products (World development indicators, 2012). The research employs the annual growth rate of Tanzania's GDP in percentage from 2011 to 2019.

Inflation: Inflation is the rise of general price of goods and services for the specified period. It is measured by using the consumer price index (World development indicators, 2012).

Exchange Rate: Exchange rate refers to the charge that used to exchange one currency from another and it is determined by the international money market where the market forces operate (World development indicators, 2012).

Interest Rate: This is the cost of loan that incurred by the borrower for the received loans from lenders for the borrowed money Nyabakora, W, et al. (2020) that is determined by banking sector.

Government Debt: In the long run, debt holders charge high interest due to the debt to GDP ratio increases to the extent of

claiming the compensation for the marginal risk they won't be repaid. This increase on interest rates results to slow the economic growth. Supporting the above notion, Eze, Onyebuchi Michael; Nweke, Abraham Mbam, and Atuma Emeka (2019) assert that, the government debt has negative effect on the economic performance.

RESULTS

Data Analysis and Interpretation: This study employs STATA 12 package to carry out Descriptive Statistics, Correlation and Regression Analysis while testing for auto-correlation as follows;

Table 1. Durbin Watson Test

Variable	Durbin-Watson d-statistic
ROA	1.087453

Durbin Watson Test: The study employed Durbin Watson test to test the presence of autocorrelation. From table (1) below the value of 1.087453 for the Durbin Watson statistic indicates that the null hypothesis of no autocorrelation is not rejected. This implies that the residuals are not serially correlated.

Descriptive Statistics: Descriptive statistics gives initial indication of variables that can be used in regression analysis giving several summarized statistics on a variable. In this study descriptive statistics consist of five variables that are independent variables (GDP Rates, INFR, INTR, EXCR Tshs/Usd and Government Debts) and dependent variable (ROA) as it is shown in the table (2) below shows the characteristics of the variables used by revealing the statistical mean, standard deviation, minimum, and maximum values. The findings reveal that the average of bank performance over the period from 2011 to 2019 is 2.84356%. The results indicate that bank performance (ROA), economic growth (GDP), inflation interest rate and Government debts do not deviate much from the mean (the variables have smaller standard deviation) thus the more accurate are the future predictions.

Regression Analysis: Table (3) reports regression analysis about the impact of macroeconomic variables on bank performance, the study employed multiple regression analysis using Pooled Ordinary Least Square Regression Model. The findings reveal that economic growth (GDP) has an insignificant positive relationship between bank performances (ROA) at 10 % level of significance. Therefore does not reject the null hypothesis. This is consistent with the findings of Kanwal, Nadeem, (2013). It is found that, inflation has a negative and insignificant effect on bank performance at 10 % level of significance. Thus, the result does not reject null hypothesis that inflation has inverse relation with banks' performance. This finding is consistent with the empirical study by Sanusi, M., Zulaikha, S. (2019). Furthermore, the results indicate that exchange rate has an insignificant negative effect on bank performance at 10 % level of significance. The study therefore does not reject the null hypothesis that exchange rate affect the banks' performance negatively. The Government Debts has statistically significant with negative effect on bank performance at 10 % level of significance. This finding is consistent with the empirical study by Pegkas, (2018), Eze, et al. (2019),

Correlation Analysis: The relationship between macroeconomic variables and bank performance (ROA) was established by using a Pearson correlation analysis.

Table 2. Descriptive Statistics Analysis

WQ	Observation	Mean	Std Deviation	Min	Max
ROA	45	0.0284356	0.0157851	0	0.6
GDP Rates	45	0.0631111	0.009101	0.045	0.77
INFR	45	0.0720111	0.041948	0.345	0.16
INTR	45	0.776556	0.0364948	0.246	0.1452
EXCRTsh/usd	45	1934.669	308.8865	1574.349	2290.42
Govt Debts	45	0.3597778	0.014846	0.336	0.39

Source: Authors' Computations using STATA 12 Package

This study involved identifying the existence of correlation between bank performance (ROA) and macroeconomic variables (GDP, inflation, interest rate, Government Debts and exchange rate) using correlation coefficients obtained from the correlation matrix. The relationship between the dependent variables and independent variables shown in the table (4) below, The findings reveal that, the independent variables (GDP Rates, INTR, EXCR Tshs/Usd and Govt Debts) have the negative impact on ROA but EXCR Tshs/Usd and Government Debts are statistically significant at 90% while Inflation having positive impact on ROA but is statistically insignificant and on bank performance (ROA) at 90%.

Discussion of Findings

The results in Table 3 indicate that the annual real GDP growth rate has a major influence on non performing loans rate. Its coefficient of the variable is statistically insignificant having positive relationship with ROA, which is consistence with our hypothesis. This means, the improvement of Tanzanian economy, improve the income of banks' customers and their decision on investing and saving that may end up leaving their money with banks and the same can be used by banks efficiently and effectively to make profit. Our results match with the empirical finding by Kanwal, S., Nadeem, M., (2013). While studying the inflation rate (INFR), the projected coefficient is statistically insignificant and negative relationship with ROA, so, we accept the hypothesis. This means, the raise in the inflation rate makes the general price level of all goods and services to increase and that, reduce savings the same to investments. The finding is in line with the findings of Sanusi, M., Zulaikha, S. (2019). When the inflation is unanticipated one, banks fail to adjust the rates timely, while having general price rise that lowers profit and sometimes get loss. For the case of Tanzania, the economy with infant financial markets faces unanticipated inflation that ends to negative effects.

The increase in the exchange rate makes it harder to sell overseas due to the rise in relative prices. Reduction in exportation, leads to lower level of bank loans because the product have no market abroad, so reduction in profit, even those having bank loans, are unable to repay the installments and become bad loans that affects liquidity and profitability. Also, a fall in a value of the currency reduces the general price level of goods and services in the economy. This action attracts more investors from abroad, invest and provide employment to local people who in turn become banks' customers and contribute in profit making. Not only that, but also, a cheaper currency in the sense of positive multiplier effect, boosts the economy. However, it negatively affects the banks' performance.

Table 3: Regression Analysis

Source	SS	df	MS		
Model	0.002279468	5	0.000455894	Number of Observation	= 45
Residual	0.008683973	39	0.000222666	F (5, 39)	= 2.05
				Prob > F	= 0.0932
				R-squared	= 0.2079
				Adj R-squared	= 0.1064
Total	0.010963443	44	0.000249169	Root MSE	= 0.01492

ROA	Coef.	Std Err.	t	P> | t |	[90% Conf.	Interval]
GDP Rates	0.0370562	0.3378654	0.11	0.913	-0.5322049	0.6063173
INFR	-0.129582	0.112407	-1.15	0.256	-0.3189738	0.0598097
INTR	0.0613454	0.086984	0.71	0.485	-0.0852119	0.2079026
EXCRTsh/Usd	-0.0000155	0.0000149	-1.05	0.302	-0.0000406	9.51e-06
Govt Debts	-0.536137	0.2662479	-2.01	0.051	-0.9847315	-0.0875425
-cons	0.2536064	0.0854144	2.97	0.005	0.1096937	0.397519

Source: Authors' Computations using STATA 12 Package

Table 4: Correlation Analysis

	ROA	GDP Rates	INFR	INTR	EXCR Tshs/Usd	Govt Debts
ROA	1					
	0					
GDP Rates	-0.0601	1				
	0.6949	0				
INFR	0.1640	-0.1837	1			
	0.2816	0.2271	0			
INTR	-0.0684	-0.0386	-0.6782	1		
	0.6553	0.8010	0.0000	0		
EXCR Tshs/Usd	-0.2879*	-0.1379	-0.7864*	0.5916*	1	
	0.0551	0.3662	0.0000	0.0000	0	
Govt Debts	-0.3726*	0.3593*	-0.7327*	0.5218*	0.6657*	1
	0.0117	0.0.0153	0.0000	0.0002	0.0000	0

Source: Authors' Computations using STATA 12 Package

Our finding is in line with Sangeetha Moorarka Chinu (2019), Emase, (2017), Konadu, (2016), Hamid, Ghosh, (2019) results. Therefore, we accept the null hypothesis. The study reports that, interest rate affects negatively the banks' performance and statistically insignificant. The result demonstrate that when banks rise real interest rates, discourages the bank customers like borrowers and the increase is the non-performing loans that affects liquidity and profitability of banks. Therefore, we accept the null hypothesis that, interest rate has negative effects on banks' performance. Debt holders charge high interest due to the increase debt-GDP ratio to the extent of claiming the compensation for the marginal risk they won't be repaid. This increase in interest rates results to slow the economic growth.

Also, some of the debts were not used for development projects that could produce the liquidity to pay for the loans. So any action of repaying the loans reduces the purchasing power of the country and disturbs the economy. Supporting the above notion, Eze, Onyebuchi Michael; Nweke, Abraham Mbam, and Atuma Emeka (2019) assert that, the government debt has negative effect on the economic performance.

Conclusion

Investigating on how the macroeconomic variable proxies (GDP growth rate, inflation rates, exchange rate, Government Debts, and interest rate) affect banks' performance proxy (Return on Assets) for the period 2011 to 2019 in Tanzania economy, the study employed multiple regression analysis using Pooled Ordinary Least Square Regression Model. The findings reveal that, economic growth (GDP) has an insignificant positive relationship with bank performances (ROA) at 10 % level of significance. Therefore it does not reject the null hypothesis that, GDP has positive effect on banks' performance. However the results denote that, inflation has a negative and insignificant effect on bank performance at 10 % level of significance. Thus, the study does not reject null hypothesis that inflation affects negatively the banks' performance. Not only that, but also, the results indicate that exchange rate has an insignificant and negative effect on banks' performance at 10 % level of significance. The study also does not reject the null hypothesis that exchange rate has negative effect on banks' performance. Moreover, it is revealed that, the Government Debt has statistically significant and negative effect on banks' performance at 10 % level of significance, consistence with the null hypothesis. Therefore, as the results indicate that banks' performance (ROA), economic growth (GDP), inflation rate, interest rate, and Government debts do not deviate much from the mean (the variables have smaller standard deviation), thus the more accurate are the future predictions. The economic regulators and policy makers have to concentrate on adjustment of macroeconomic factors like inflation, exchange rates, interest rates, government debts, and GDP which have an impact on the performance of banks.

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