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RELATIONSHIP BETWEEN MACROECONOMIC FACTORS AND PERFORMANCE OF COMMERCIAL BANKS IN KENYA

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ABSTRACT

Every organization that hopes to achieve its objectives must prioritize performance. An organization's performance is attributed to its ability to find and use the resources required for operational processes in obtaining a competitive advantage over its competitors. The goal of this study was to see how macroeconomic conditions influence commercial bank performance in Kenya. The causal research design was utilized to determine the relationship between the independent variables of GDP, interest rate, exchange rate, and inflation rate, and the dependent variable of performance. For the period 2009-2018, secondary data was gathered from the audited financial statements of Kenyan commercial banks, the Kenya National Bureau of Statistics, and the Central Bank of Kenya. A multivariate panel regression model was used in the study. According to the findings, interest rates and exchange rates had positive and negative statistically significant relationships with commercial bank financial performance. According to the study's findings, interest rates and exchange rates influenced commercial bank performance, however the GDP and inflation had little impact on commercial bank financial performance in Kenya.

Keywords: *Macroeconomic Factors, Inflation, Gross domestic Product, Foreign Exchange, Return on Assets (ROA), Performance.*

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INTRODUCTION

Commercial banks' performance in Kenya is determined by their proclivity to seek out resources required for everyday operations and use them to gain a competitive advantage over their competitors (Mbithi et. al, 2016). According to Otuori (2013), commercial banks play a critical role in the allocation of economic resources and in stimulating economic growth in a given country by providing financing to investors, resulting in financial expansion. Commercial bank financial performance is critical to the growth of the industry as a whole, which in turn contributes to an economy's prosperity (Muriu & Ouma, 2014). Return on assets (ROA) and return on equity (ROE) are two basic financial performance indicators used by banks (ROE).

According to (Ongore 2014, Burca & Batrinca, 2014), banks' financial performance is influenced by both microeconomic and macroeconomic factors. External profit is heavily influenced by macroeconomic conditions. The interaction of individuals, companies, and financial institutions within a given economy is one of the primary driving forces of that economy. A sound and favorable economic climate in a given economy is required for financial institutions to function effectively and efficiently (Mbithi, Gor & Osoro, 2016). Financial institutions must be tightly linked to the global economy. Increased integrations and rising economic instability necessitate more attention in order to understand the influence of macroeconomic conditions on the development of organizations (Ngile & Simiyu, 2015).

Economic factors are essentially utilized as a platform for determining a country's economic success. Macroeconomics is an aggregate economy that affects a huge population rather than a few individuals at the regional or national level. Most economists look at macroeconomic factors primarily when they are exploring trajectories to meet economic policies, goals, and create economic stability, according to Bednarczyk (2014), which allows them to predict future levels of unemployment, inflation, and national income, among other key macroeconomic factors. Some of these forecasts have an impact on individual, private-sector, and government decision-making in a given economy. Macroeconomic parameters such as gross domestic product (GDP), national income, inflation, unemployment, price level, saving and investment, and economic production are some of the key determinants of the economic performance and are closely monitored by the financial institutions as well as the government, Ngile & Simiyu (2015).

Statement of the Problem

Commercial bank is a financial institution which plays a very key intermediary role in a given economy, it performs a very key function of accepting deposits from the surplus economic unit (saver) and transfer the funds to the deficit economic unit (Borrower/ investors) with an aim of earning profit. Commercial banks contribute positively in curbing unemployment in an economy, employment generally in the banking sector staff level increased by 5,412 from 25,491 in 2008 to 30,903 in 2017 representing an increase of 21.23 per cent, Central Bank of Kenya, (2017).

Macroeconomic factors impact financial institutions in various ways. Efficiency of the financial intermediation can be affecting the economic growth of financial institutions in a given country. The ability of macroeconomic factors to explain movement in the bank risks and profit have been pivot of focus by many scholars since commercial banks are most important financial intermediaries in most economies that provide a number of different product and services, Sufian (2009).

Therefore, it is important to determine the macroeconomic factors that might have adverse effect on the performance of the commercial banks in Kenya, although, some studies have focused on the relationship between macroeconomic factors and the performance of the commercial banks, none have focused on more than one macroeconomic factor, they consider only some

selected macroeconomic factors. For example, Kipngetich (2011) did a study on the relationship between interest rate and financial performance of the commercial banks in Kenya and found that there is a positive relationship between interest rate and performance of commercial banks in Kenya, Wamucii (2010), examined the relationship between inflation and financial performance of commercial banks in Kenya and established that the performance of commercial banks improves with increase in inflation, Sheefeni (2015) looked at the macroeconomic determinants of profitability among commercial banks in Namibia. The study state that in a country where the financial sector is dominated by a few single large commercial banks any failure of the sector has enormous potential impact on the economy.

Though there exists a large and growing body of literature on macroeconomic factors and performance of commercial banks, most of the research has been conducted in the developed countries with little attention focused on developing countries and also focusing on a specific one or two macroeconomic factors, therefore, it is with this in mind that this study intended to establish and measure the relationship between the macroeconomic factors and the performance of commercial banks in Kenya.

Status of Banking Sector in Kenya

The economic momentum that started in 2003 was constrained by a number of both internal and external factors in the year 2008 which includes the post-election disruptions, the global financial crisis, adverse weather conditions among others. All these factors combined slowed down the economic growth from 7.1 per cent in the year 2007 to 1.7 per cent in the year 2008, towards the end of the year 2009, the Kenya's economy started to recover more strongly, and the positive momentum was sustained into the year 2010. The resilience of the Kenya economy was evident in 2010 when the real Gross Domestic Product expanded by 5.6 per cent after suppressed growth of 1.7 per cent and 2.6 per cent in the year 2008 and 2009 respectively. The growth enabling environment in 2010 reversed in 2011 with adverse supply side shocks the manifested in higher domestic food and fuel inflation. The economic growth is estimated have expanded by 4.4 per cent in 2011 and in year 2012 grew by 4.6 an improvement from 2011. In the year 2013 the economy grew by 4.7 per cent, and in the consecutive years the economy grew by 5.3 per cent and 5.6 per cent in 2014 and 2015 respectively which was a slight improvement. I the year 2016 the GDP grew by 5.8 per cent, in the year 2017 the economy slowed to 4.9 per cent from 5.8 per cent in the year 2016 which was largely because of adverse weather condition that affected agricultural performance coupled with uncertainty associated with prolonged electioneering period in the second half of the year 2017.

Central Bank of Kenya (2012), inflation eased in 2012 following improved weather conditions, lower world crude oil prices and tight stance of monetary policy in the first half of the year. Inflation declined from 18.31 per cent in January 2012 to 3.20 percent in December 2012. This decline reflected a fall in food inflation, fuel inflation as well as nonfood, non-fuel inflation. Overall inflation remained elevated in the first half of 2016 largely on account of food inflation arising from high food prices that have persisted since July 2016. Annual average inflation increased slightly to 6.6 percent from 6.5 percent in 2015. And in 2017 Overall inflation remained elevated in the first half of 2017, owing to increased food prices occasioned by unfavorable weather conditions during the first half of 2017. Consequently, annual average inflation increased to 8.0 percent in 2017 from 6.6 percent in 2016. Central Bank of Kenya (2017),

In 2008, the Kenya shillings weakened against the US dollars mainly due to increased demand for US dollar in the domestic foreign exchange market that was driven by expectations of the increased importation of maize. Thus, against the US dollar the shillings weakened to exchange at an average of Kshs. 78 per USD in December 2008 compared to Kshs. 63.30 per USD in December 2007 and contrary

to turbulent exchange rate movement experienced in the year 2008 mainly due to post election violence, year 2009 saw Kshs recollecting itself and maintaining a fair stable exchange rate against USD throughout the year. The Kshs appreciated to exchange at an average of Kshs 75.43 pre USD compared 78.04 per USD in December 2008 depicting – 3.46 per cent.

Consistent with the tight monetary policy stance, retail interest rates by the commercial banks rose in 2015. The average lending rate increased from 15.93 per cent in January 2015 to 16.16 per cent in December 2015. Commercial banks' average lending interest rates remained stable at 16.58 percent in 2016 compared to 16.16 percent in the year 2015 and in 2017 Commercial banks' average lending interest rates remained stable within the interest rate caps. The average commercial bank lending rate declined to 13.67 percent in 2017 compared to 16.59 percent in 2016.

METHODS AND DATA

Data Issues: The population of the study comprised of all licensed commercial banks in Kenya between the period 2009 and 2018. There were 42 registered commercial banks in Kenya in the year 2018 but the researcher concentrated on 37 commercial banks since 2 commercial banks were under receivership and the other three were not fully operational during the period of study from 1st January 2009 to December 2018.

Data collection: The study used secondary data on macroeconomic factors; Consumer Price Index (CPI) for inflation, Gross Domestic Product (GDP), Interest rates and Exchange rates (Kenya shillings and USD). The data on inflation (CPI) and Real GDP growth was obtained from Kenya National Bureau of Statistics, while the data on exchange rate (Kshs and USD) was obtained from Central Bank of Kenya. The data is public data since it is published in the websites of the relevant government agencies, which includes CBK and KNBS. The data on interest rate and Return on Assets of the individual banks on sample was obtained from quarterly published financial statements; lending interest rate is obtained by dividing net advances by interest on advance.

Diagnostic tests: Prior to carrying out regression, diagnostic tests were carried out which included Normality tests, multicollinearity tests and autocorrelation tests

Normality Test: According to Obillo, (2014), the null hypothesis that the data is not normally distributed while the alternative hypothesis is that data is normally distributed. A p-value of less than 5% or 0.05 shows non normality of the data, whereas a p-value of more than 0.05shows that there is normality.

Table 1: Skewness/Kurtosis tests for normality

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
ReturnonAs~A	340	0.0000	0.0000	.	0.0000
InflationCPI	340	0.0000	0.0336	39.76	0.0000
GrossDomes~t	340	0.4180	0.0120	6.75	0.0343
Exchangera~d	340	0.9838	0.0000	.	0.0000
InterestRate	340	0.0018	0.0009	17.49	0.0002

Source: Research Data (2022)

Multicollinearity Test

Table 2: Multicollinearity Tests

```
. regress ReturnonAssetROA InflationCPI GrossDomesticProduct ExchangerateKshsUsd InterestRate
```

Source	SS	df	MS	Number of obs	=	340
				F(4, 335)	=	5.45
Model	.014921646	4	.003730411	Prob > F	=	0.0003
Residual	.229460699	335	.000684957	R-squared	=	0.0611
				Adj R-squared	=	0.0498
Total	.244382345	339	.000720892	Root MSE	=	.02617

ReturnonAssetROA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
InflationCPI	-.0785743	.0878349	-0.89	0.372	-.2513518	.0942033
GrossDomesticProduct	.2096933	.1252947	1.67	0.095	-.0367702	.4561569
ExchangerateKshsUsd	-.0004628	.0001606	-2.88	0.004	-.0007787	-.0001469
InterestRate	.0023586	.0010633	2.22	0.027	.000267	.0044501
_cons	.0240568	.0208307	1.15	0.249	-.0169187	.0650322

```
. vif
```

Variable	VIF	1/VIF
InflationCPI	2.89	0.345590
InterestRate	2.37	0.421342
GrossDomes~t	1.46	0.685912
Exchangera~d	1.08	0.924053
Mean VIF	1.95	

Source: Research Data (2021)

Tolerance and variance inflation factor tests were conducted on the independent variables to test multicollinearity. The tolerance value of less than 0.1 indicate multicollinearity, the results above indicate a tolerance level of 0.372, 0.095, 0.004 and 0.027 for inflation rate, Gross Domestic Product growth rate, Exchange rate and interest rate respectively.

A VIF of 10 indicate multicollinearity. The results obtained shows VIF level of 2.89, 2.37, 1.46 and 1.08 for inflation rate, Gross Domestic Product growth rate, Exchange rate and interest rate respectively. The researcher noted that all the independent variables had a VIF of greater than 1 but less than 10, therefore there was no multicollinearity amongst the variables.

Autocorrelation Tests

Table 3: Autocorrelation test

Prais-Winsten AR(1) regression -- iterated estimates

Source	SS	df	MS		
				Number of obs	= 340
				F(4, 335)	= 10.34
Model	.009528992	4	.002382248	Prob > F	= 0.0000
Residual	.077166867	335	.000230349	R-squared	= 0.1099
				Adj R-squared	= 0.0993
Total	.086695859	339	.00025574	Root MSE	= .01518

ReturnonAssetROA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
InflationCPI	-.0259403	.0460893	-0.56	0.574	-.1166011	.0647206
GrossDomesticProduct	.2375533	.0644643	3.69	0.000	.1107474	.3643592
ExchangerateKshsUsd	-.0004719	.0001838	-2.57	0.011	-.0008335	-.0001103
InterestRate	.0014059	.0006476	2.17	0.031	.0001321	.0026797
_cons	.0336171	.0166093	2.02	0.044	.0009454	.0662887
rho	.802889					

Durbin-Watson statistic (original) 0.335843
Durbin-Watson statistic (transformed) 2.005575

Source: Research Data (2021)

The original Durbin Watson statistic of 0.335843 indicate the existence of a serial correlation, the data set was transformed, and new Durbin Watson statistic obtained was 2.005575, which is approximately equal to the threshold of 2 hence based under transformed result depicting that there is no autocorrelation

RESULTS

Inferential Statistics

Multiple linear regression analysis was used to determine the overall relationship between macroeconomic factors and performance of the commercial banks in Kenya. The macroeconomic factors that were of interest to this study included gross domestic product, interest rate, inflation rate, and exchange rate. A regression model was fitted to the data on the macroeconomic factors (predictors) and the corresponding outcome variable (ROA). The linear regression analysis result is presented table 4 below.

Table 4: Linear Regression Results

Source	SS	df	MS
Model	.014921645	4	.003730411
Residual	.229460699	335	.000684957
Total	.244382344	339	.000720892

Number of obs	340
F(4, 335)	5.45
Prob > F	0.0003
R-squared	0.0611
Adj R-squared	0.0498
Root MSE	.02617

ROA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
GDP	.2096934	.1252947	1.67	0.095	-.0367702	.4561569
InterestRate	.0023586	.0010633	2.22	0.027	.000267	.0044501
Inflation	-.0785742	.0878349	-0.89	0.372	-.2513518	.0942033
ExchangeRate	-.0004628	.0001606	-2.88	0.004	-.0007787	-.0001469
_cons	.0240568	.0208307	1.15	0.249	-.0169187	.0650322

Source: Research Data (2021)

Model Summary

Based on the regression model statistics contained in the regression table above, the R-square (R^2) value of 0.0611 suggests that macroeconomic factors caused 6.1% variation in the performance of commercial banks in Kenya. In effect, this implies that other factors outside the scope of this study would explain 93.9% of the variation in performance of commercial banks.

Analysis of Variance (ANOVA)

The goodness of fit of the regression model used to predict the relationship between the independent (macroeconomic factors) and dependent (performance) variables was determined by the Analysis of variance (ANOVA) test statistics. ANOVA test statistics from the regression analysis show that the model used to predict the relationship between macroeconomic factors (GDP, interest rate, inflation rate, and exchange rate) and performance of commercial banks (dependent variable) was statistically significant as shown by the F-statistic of 5.45 and the probability value of 0.0003 ($p<0.05$).

Regression Coefficients

The direction of the relationship between macroeconomic factors and performance of commercial banks is indicated by the regression coefficients. Based on the regression coefficients, interest rate (t=2.22, p=0.027) and exchange rate (t= -2.88, p=0.004) had a positive and negative statistically significant relationship respectively with performance of commercial banks ($p<0.05$). On the other hand, GDP growth rate (t=1.67, p=0.095) and inflation (t= -0.89, p= 0.372) produced values that were statistically insignificant ($p>0.05$). The constant value of 0.024 demonstrates that if macroeconomic factors in this study were rated zero, performance of commercial banks would be 0.024.

Results from the regression coefficients suggest that a unit increase in GDP growth rate would cause 0.2096-unit increase in performance as measured by ROA. Moreover, a unit increase in real interest rate would lead to increase in return on assets by 0.0023 whereas a unit increase in inflation would cause -0.07857-unit decrease in ROA. Lastly, a unit increase in exchange rate would lead to a decrease in ROA by -0.00046.

The panel regression model for the relationship between macroeconomic factors (GDP, interest rate, inflation rate, and exchange rate) and performance of commercial banks in Kenya was as follows:

$Y_{it} = 0.024057+0.209693\mathbf{X}_{1it}+ 0.002359\mathbf{X}_{2it} + -0.07857\mathbf{X}_{3it} + -0.00046\mathbf{X}_{4it}$

Where:

Y=ROE

X1=GDP

X2=Interest rate

X3=Inflation rate

X4=Exchange rate

it - Number of listed commercial banks for each period

DISCUSSION OF RESEARCH FINDINGS

The general objective of the study was to examine the relationship between macroeconomic factors and performance of the commercial banks in Kenya. Return on asset was used as a proxy measurement for performance in the banking industry. The macroeconomic factors as the predictor variables consisted of GDP growth rate, interest rate, inflation rate charged by banks to borrowers, and exchange rate between the US dollar and the Kenyan Shillings. The overall macroeconomic factors affect performance of commercial banks in Kenya albeit to a smaller extent. Simply put, 6.1% variation in financial performance of banks is directly contributed by macroeconomic factors that were considered in this research work. The ANOVA statistics show that the regression model used to predict the relationship between macroeconomic factors and performance of commercial banks meets the threshold of goodness of fit given that it was statistically significant.

The results of the study showed that GDP growth rate had a positive relationship with financial performance of commercial banks although this relationship was not statistically significant. This finding herein is in agreement to some extent with other empirical studies carried out in Kenya as well as in other countries. For instance, a study undertaken in India by Alam, Rabbani, Tausif, and Abey (2021) on the interplay between banks' performance and economic growth found out that there was co-integration between economic growth as measured by GDP and bank-related factors. In the study, ROA depicted a significant relationship economic growth. A study by Hamza and Khan (2014) found out that GDP as a measure of economic growth had a positive relationship with bank financial performance. Other studies that are consistent with this finding include Nadeem (2013) and Michael *et. al*. (2014). Conversely, a study carried out in Kenya by Kiganda (2014) on the effect of macroeconomic factors on profitability of Equity Bank established that real GDP had an insignificant effect on the bank's profitability.

Besides, the findings of the study showed that interest rate exhibited a positive and statistically significant relationship with financial performance of commercial banks in Kenya. Several studies have arrived at similar results on the relationship between interest rate and performance in the financial sector. For example, a study by Rono, Wachilonga and Simiyu (2014) established a significant correlation between interest rate and return on assets among commercial banks listed in Nairobi Securities Exchange in Kenya. Nonetheless, there are studies that have established a negative relationship between interest rate and financial performance of commercial banks. A study carried out in Pakistan by Ahmed, Rehan, Chhapra, and Supro (2018) found out that bank profitability was negatively affected by interest rate.

In regard to inflation rate, the results of the study revealed that inflation rate had a negative and statistically insignificant relationship with financial performance of commercial banks. In other words, as the rate of inflation eases financial performance of commercial banks tends to increase, but this inverse relationship is not statistically significant, meaning that it would be occurring by chance. Past empirical evidence seems to converge to this finding of the study. For instance, results from a study on the effect of macroeconomic factors on

profitability of Equity Bank in Kenya found out that inflation rate did not affect bank profitability given that the former depicted an insignificant relationship with the latter (Kiganda, 2014). Nonetheless, a study by Moyo and Tursoy (2020) in South Africa agrees, to some degree, with the present study where it established a significant inverse relationship between inflation and financial performance of banks.

Lastly, the results of the study revealed that exchange rate depicted a negative and statistically significant relationship with performance of commercial banks. This finding is consistent with results established by other studies on the relationship between exchange rate and financial performance. A study by Elhussein and Osman (2019) found out that fluctuation in exchange rate had a negative effect on the financial performance of Sudanese banks. In Bangladesh, Hossin and Mondol (2020) found out that financial performance and exchange rate fluctuations exhibited a weak negative relationship.

CONCLUSIONS

Based on the findings of this study, the study concluded that performance of commercial banks in Kenya was significantly influenced by interest rate and exchange rate. Financial performance of commercial banks was not significantly affected by real gross domestic product and inflation rate. Overall, the study concluded that the influence of macroeconomic factors on performance of commercial banks was weak. Macroeconomic factors explained only 6.1% variation in performance of commercial banks in Kenya for the period 2009-2018 while 93.9% change in ROA would be explained by other factors. ANOVA statistics showed that the model used to predict the relationship between macroeconomic factors and performance of commercial banks had a good fit and was reliable since it was statistically significant.

The results from the study revealed that GDP and interest rate were positively correlated with performance in the banking sector as measured by ROA. On the other hand, inflation and exchange rate were negatively correlated with ROA. Interest rate and exchange rate depicted a statistically significant relationship with ROA. Accordingly, the study concluded that interest rate and exchange rate affected the financial performance of commercial banks in Kenya albeit to small extent. Further, the study concluded that GDP and inflation did not affect the financial performance of commercial banks in Kenya.

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