Changes in Macroeconomic Variables and Financial Performance of Nigerian Deposit Money Banks

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ABSTRACT

This study examined how changes in macroeconomic variables impact financial performance of Nigerian banks from 2010 till 2021 using panel data and estimated utilising panel regression analysis and descriptive analysis. The multiple regression model used Real GDP Growth (RGDPG), lagged Real GDP Growth (RGDPG (-1)), Inflation (INF), Exchange Rate (EXR), Interest Rate (PLR), Money Supply Growth (GMS), and Liquidity Ratio (LIQ) as proxies of macroeconomic variables and as independent variables while financial performance, captured by both asset and equity returns (ROA) and (ROE) were dependent variables. With the exception of INF plus RGDPG, the panel regression analysis results showed that changes in most of the macroeconomic variables have negative and significant impacts on the financial performance of Nigerian banks. RoA and RoE are negatively and negligibly impacted by real GDP, whereas both RoA and RoE are positively and negligibly impacted by inflation. The research recommended that when creating and putting into practice strategic plans, Nigerian banks should consider how macroeconomic conditions may affect their operations and financial performance. Furthermore, banks are encouraged to be involved in the development of any policies that may affect their operations.

Keywords: Monetary Policy; Inflation; Exchange Rate; Money Supply; Systemic Liquidity

INTRODUCTION

Like in any other nation, the banking sector in Nigeria is crucial for financial intermediation and mobilizing savings through the movement of funds from surplus to deficit investors across different economic sectors (Dahalan, 2012). They provide loans to start-up and established businesses as well as finance for the purchase of residences and durable consumer goods. Banks continue to be the main source of funding for private investment in emerging countries, particularly Nigeria, due to the underdeveloped status of the capital development. Bank loans are therefore essential to the growth of investment and the economy as a whole.

Profitability, asset growth, and client base expansion are the three key objectives for banks. But these objectives are rarely achieved due to a number of internal and external factors that restrict banks' capacity to play their part in the economy (Abusomwan, 2018). The distinctive qualities of each bank are among the internal factors, and they are essentially established by the decisions and judgments of the company owners. The macroeconomic elements are general features that affect banks' profitability even though they are outside of their purview.

The bank's financial performance serves as a barometer for how effectively it can manage and control its own resources. It speaks of achieving the company's financial objectives within a given time frame, including the collection and distribution of funds. Bank financial performance indicators have been subject of several studies (Krakah & Ameyaw, 2010), and a variety of ratios have been found to be the most popular measures of banks' profitability. The most significant of these ratios are asset return, equity return, earnings per share, and non-performing loan ratio (Magweva & Marime, 2016; Nicolae, Bogdan & Iulian, 2015).

The operations of Nigerian banks are influenced by macroeconomic factors such as political, economic, social, legal, and technological issues. The effects of numerous macroeconomic forces are measured using indicators

such as inflation plus liquidity, among others. Degree of variation among these attributes affects how well banks perform.

As a result, this study examines how changes in macroeconomic variables impact Nigerian banks' financial performance.

EMPIRICAL REVIEWS

Hossin and Modol (2020) empirically examined, using multiple linear regression analysis, rate of exchange and financial performance of Bangladesh's government banks. Asset returns was regressed against inflation, interest rate spread, plus foreign exchange fluctuation that were the independent factors for exchange fluctuations. The investigation revealed a weak negative association between financial performance and fluctuations in exchange rates. Annual rises in the inflation rates were noted throughout the inquiry. However, they emphasized that there was a connection between inflation and asset return rates that was positive, which was advantageous for performance. According to the data, bank deposit rates have not increased similarly to how lending rates have been rising over time.

Manyo, Sabina, and Ugochukwu (2016) looked at how foreign exchange transactions affected Nigerian bank profitability from 2010 till 2014. The Kao panel co-integration estimation results demonstrate a long-term relationship between foreign exchange transactions and bank profitability. The DOLS outcome, however, revealed a tenuous and insignificant link between both variables. Even while total asset, the control variable, had a positive impact on bank profitability over the study timeframe, total equity had the opposite effect.

Amassoma and Odeniyi (2016) investigated effects of rate of exchange on expansion of the Nigerian economy utilizing yearly data from 1970 till 2013. Multiple regressions were among the econometric techniques utilised in the research. Results provided evidence that changes in rate of exchange have both short and long run, positive but insignificant effect on Nigeria's GDP. Result outcomes that helped to minimize the effects of currency fluctuation during the course of the study, are attributed to the Nigerian government's success in controlling a number of other important macroeconomic factors that affect exchange rates.

METHODOLOGY

Research Strategy

Ten (10) Nigerian deposit money banks were selected utilizing the survey sampling. The banks were Zenith Bank Plc, Guaranty Trust Bank (GTB) Plc, Access Bank Plc, First Bank of Nigeria, United Bank of Africa Plc, Stanbic IBTC, Citibank Nigeria Limited, Fidelity Bank Plc, Union Bank of Nigeria Plc, and First City Monument Bank Limited. The choices of the banks are hinged on their size and data availability. Secondary data was utilised for this research and covered years 2010 to 2021.

Model Specifications

Empirical models from past works by Abiodun and Mlanga (2019) and Olaoye and Olarenwaju (2015) were used and modified in this investigation. The model implicit form was:

$$ROA_{it} = f(RGDPG_t, RGDPG_{t-1}, INF_t, INT_t, EXR_t, GMS_t, LIQ_t)\text{--------------equ (1)}$$

$$ROE_{it} = f(RGDPG_t, RGDPG_{t-1}, INF_t, INT_t, EXR_t, GMS_t, LIQ_t)\text{--------------equ (2)}$$

Linearly;

$$ROA_{it} = \alpha_0 + \beta_1 RGDPG_t + \beta_2 RGDPG_{t-1} + \beta_3 INF_t + \beta_4 INT_t + \beta_5 EXR_t + \beta_6 GMS_t + \beta_7 LIQ_t + \mu_{it}\text{-----------equ (3)}$$

$$ROE_{it} = \alpha_0 + \beta_1 RGDPG_t + \beta_2 RGDPG_{t-1} + \beta_3 INF_t + \beta_4 INT_t + \beta_5 EXR_t + \beta_6 GMS_t + \beta_7 LIQ_t + \mu_{it}\text{--------------equ (4)}$$

Where:

ROA_{it}= Asset Return of bank i at period t (measure of financial performance in DMBs).

ROE_{it}= Equity Return of bank i at period t (measure of financial performance in DMBs).

$RGDPG_t$ = Real gross domestic product growth rate at time t (measure of economic growth)

$RGDPG_{t-1}$ = Lag of real gross domestic product growth rate at period t

INF_t = Inflation rate at period t (measure of investment risk and price instability)

INT_t= Interest rate at time t (measured by prime lending rate

EXR_t = Exchange rate at time t

GMS_t = Growth of broad money supply at time t

LIQ_t= Liquidity ratio at time t

Estimation

Descriptive Analysis of Macroeconomic Variables affecting Banks' Financial Performance

Table 2 below lists the variables that are used to measure macroeconomic characteristics, including real GDP growth, inflation, prime interest rate, exchange rate, growth of the money supply, liquidity ratio, and financial performance captured by equity and asset returns. The descriptive statistics were performed over the course of a 12-year period, a total of 120 observations covering information from ten (10) banks were made (20010 to 2021).

The figures in the table reveal that the average equity returns (ROE) and asset return (ROA) for the banks under examination were 1.96% and 15.59%, respectively. The average return on assets is modest when compared to the average equity return, which was considerably higher. Median return on assets for banks suggests that they are not making the best use of their assets to generate profits. 3.61%, 12.23%, 16.76%, N220.90, 12.80%, and 48.47%, respectively, are the average values for real gross domestic product growth (RGDPG), inflation, prime lending rate (PLR), exchange rate (EXR), growth of money supply (GMS), and liquidity ratio (LIQ). This may indicate an unfavorable and challenging macroeconomic climate, exposing banks to severe credit and market risks that affect non-performing loans and financial performance.

Table 1: Descriptive Statistics

	ROA	ROE	RGDPG	INF	PLR	EXR	GMS	LIQ
Mean	1.9638	15.5851	3.6175	12.2250	16.7600	220.8975	12.8050	48.4717
Median	1.8800	13.4300	3.5000	11.9000	16.8200	175.9150	14.1747	46.0900
Maximum	8.6200	112.3900	9.5400	18.5000	19.3300	358.8100	22.7670	75.9100
Minimum	-30.980	-64.0400	-1.9200	8.0000	12.3200	148.8800	2.3017	26.3900
Std. Dev.	3.8348	16.7575	3.4530	3.0720	1.7088	76.3241	6.2978	14.6710
Skewness	-5.7547	0.6245	0.0059	0.4446	-1.0258	0.5167	-0.2110	0.2869
Kurtosis	48.7267	15.0912	2.1112	2.3999	4.5764	1.6041	1.9725	2.2443
Jarque-Bera	11117.00	738.7806	3.9501	5.7547	33.4696	15.0819	6.1692	4.5017

Probability	0.0000	0.0000	0.1388	0.0563	0.0000	0.0005	0.0458	0.1053
Sum	235.6600	1870.210	434.1000	1467.000	2011.200	26507.70	1536.594	5816.600
Sum Sq. Dev.	1749.964	33416.90	1418.874	1123.025	347.4760	693219.0	4719.756	25613.38
Observations	120	120	120	120	120	120	120	120

Source: Researcher's compilation

Standard deviations were 3.83%, 16.76%, 3.45%, 3.07%, 1.71%, 76.32, 6.30%, and 14.67% for asset return, equity return, real GDP growth, inflation, prime lending rate, exchange rate, growth of money supply, plus liquidity ratio, respectively. This suggests that the study's variables have standard deviations that are reasonably close to their mean values, with the exception of the prime lending rate, exchange rate, and liquidity ratio.

Return on assets, prime lending rate, and money supply growth all showed negative skewness, but return on equity, real GDP growth, inflation, exchange rate, and liquidity ratio all showed positive skewness. The prime lending rate (4.5764), equity return (15.0912), plus asset return (48.7267) were all higher than average, according to the kurtosis statistics. The kurtosis statistics, on the other hand, are less than 3.0 for the real GDP (2.1112), inflation (2.3999), exchange rate (1.6041), growth of the money supply (1.9725), and liquidity ratio (2.2443), indicating the degree of flatness (platykurtic) of the distribution of the data series in comparison to normal.

Panel Unit Root Estimation

Findings demonstrated that while real GDP growth (RGDPG), exchange rate (EXR), liquidity ratio (LIQ), and growth of money supply (GMS) are stationary at level, asset and equity returns (ROA) and (ROE), inflation (INF), prime lending rate (PLR), and growth of money supply (ROA), ROE, and INF are stationary at first difference. As a result, we perform the panel regression analysis as illustrated below.

Table 2: Unit Root Test

Variable	Levin, Lin & Chu t*		Im, Pesaran and Shin W-stat		ADF - Fisher Chi-square		PP - Fisher Chi-square		Order of Integration
	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.	
ROA	0.44422	0.6716	-1.81933	0.0344	31.8250	0.0452	101.932	0.0000	I (0)
ROE	-4.09226	0.0000	-2.58303	0.0049	37.7573	0.0095	76.3192	0.0000	I (0)
RGDPG	-11.7221	0.0000	-6.09117	0.0000	77.5257	0.0000	73.3330	0.0000	I (1)
INF	-4.79538	0.0000	-1.97887	0.0239	30.2708	0.0656	23.6681	0.2572	I (0)
PLR	-4.26669	1.0000	-3.49539	0.0002	45.4167	0.0010	5.94918	0.9990	I (0)
EXR	-8.09532	0.0000	-2.89344	0.0019	42.2108	0.0026	7.7389	0.9935	I (1)
GMS	-5.14760	0.0000	-2.37980	0.0087	34.1724	0.0250	45.2687	0.0010	I (0)
LIQ	-3.98115	0.0000	-2.84156	0.0022	41.6428	0.0031	22.4534	0.3164	I (1)

Source: Results Obtained using Evwsie

A panel regression analysis

Macroeconomic indicators (i.e., real GDP growth, inflation rate, prime lending rate, exchange rate, growth of the money supply, and liquidity ratio) were the main focus of the panel regression analysis, while deposit money

banks' financial performance was represented by return on assets (ROA) and return on equity (ROE), which served as proxies for dependent variables.

Regression's Findings

According to table 3, there was a coefficient of determination (i.e., R-squared) of 60.7%. It remains high at 57.2% even after degrees of freedom have been taken into account. Real GDP growth, delayed GDP growth, inflation rate, prime lending rate, money supply growth owing to exchange rate, and liquidity ratio are all independent factors in the study and together they account for 60.7% of the variation in ROA.

The coefficient of real gross domestic product growth (RGDPG) assumes –0.0222. This indicates a negative and insignificant relationship exist between real gross domestic product growth and the banks' ROA. Insignificance of RGDPG at 5% level of significance is evidenced by the t-statistic value of –0.080505 and the corresponding probability value (0.9360).

Coefficient of lagged real gross domestic product growth is negative and statistically significant at 5% level of significance. The coefficient of the lagged real GDP growth shows a negative and statistically insignificant impact on banks' ROA. The result implies that adverse economic conditions negatively and significantly impact bank's financial performance.

Table 3: Regression Results (ROA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDPG	-0.022248	0.276358	-0.080505	0.9360
RGDPG (-1)	-0.904751	0.192510	-4.699751	0.0000
INF	0.363740	0.244404	1.488271	0.1401
PLR	-0.313268	0.145923	-2.146808	0.0345
EXR	-0.062179	0.015868	-3.918529	0.0002
GMS	-0.203039	0.073362	-2.767626	0.0068
LIQ	0.141292	0.045362	3.114773	0.0025
U (-1)	0.121504	0.011971	10.15001	0.0000
C	16.12729	4.122189	3.912312	0.0002
R-Squared = 0.606851	Adjusted R-squared = 0.572289	F-Statistic = 17.55808	Prob(F-statistic) = 0.000000	Durbin-Watson = 2.178250

Source: Researcher's Computation

The coefficient of inflation rate (INF) is 0.363740, implying a positive relation exist between inflation rate and ROA. Further, the result is insignificant at 5% level of significance due to t-statistic value of 1.488271 and probability value of 0.1401 which was higher than 5% significant level.

Coefficient of prime lending rate is –0.313268, implying a negative and significant relationship existed between interest rate (measured by prime lending rate) and ROA. The coefficient was statistically significant utilizing the t–statistic figure (–2.146808) and the corresponding probability value (0.0345).

Coefficient of rate of exchange (EXR) is negative with a coefficient figure of –0.062179. This means rate of exchange negatively and significantly impact the banks' ROA. The result also indicates that exchange rate with t–statistics value of –3.918529 and a corresponding probability figure of 0.0002 was statistically significant at 5% significant level.

Coefficient of the growth of money supply (GMS) was negative with the coefficient value of –0.203039 implying a negative relation between the growth of money supply and ROA. The coefficient of the growth of money supply was statistically significant utilizing the t-statistic value of –2.767626 and the corresponding probability value of 0.0068.

In relations to liquidity ratio, the result showed a positive relationship with the coefficient of 0.141292. The result suggests a positive and significant relationship between liquidity ratio and ROA as evidenced by t–statistics value of 3.114773 and corresponding probability value of 0.0025.

The sign of the error correction model is not rightly signed and significant. However, F–statistic value is very high at 17.55808 with a probability value of 0.000, implying that the variables included in the model explains the variations caused on the financial performance of deposit money banks in Nigeria. At 2.178250, Durbin Watson statistics suggests no evidence of autocorrelation.

Table 4 below revealed that the coefficient of determination (R-squared) is high at 0.6747. By implication, all the independent variables included in the study explains 67.5% of the variation in ROE of Nigerian banks. The F-value was at 23.59345 and suggested the model was statistically significant.

The result indicates that the coefficient of real gross domestic product growth (RGDPG) assumes 0.412559 implying that a positive and insignificant relationship exists between real GDP growth and ROE at 5% significant level evidenced by the t-statistic value of 0.234997 and the corresponding probability value 0.8147.

Table 4: Regression Results (ROE)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDPG	0.412559	1.755594	0.234997	0.8147
RGDPG (-1)	-5.335390	1.223071	-4.362290	0.0000
INF	2.396766	1.552814	1.543499	0.1262
PLR	-2.003086	0.927001	-2.160825	0.0333
EXR	-0.359032	0.100821	-3.561095	0.0006
GMS	-1.287174	0.466102	-2.761574	0.0070
LIQ	0.887217	0.288218	3.078290	0.0028
U (-1)	-0.754197	0.060617	12.44206	0.0000
C	92.72164	26.18446	3.541095	0.0006
R-Squared = 0.674707	Adjusted R-Squared = 0.646110	F-Statistic = 23.59345	Prob(F-statistic) = 0.000000	Durbin-Watson = 2.486370

Source: Researchers' Compilation

The result of the lagged real gross domestic product growth revealed a negative relationship with the coefficient of –5.335390. The result indicates a negative and significant relationship between the lagged real gross domestic product and ROE. This is evidenced by t–statistics value of –4.362290 and corresponding probability value of 0.0000.

The coefficient of inflation rate is 2.396766, implying a positive relationship exist between inflation and ROE. Further, the result is insignificant at 5% significant level due to t-statistic value of 1.543499 and probability value of 0.1262.

The coefficient of prime lending rate is –2.003086, implying a negative and significant relationship existed between interest rate and ROE of deposit money banks. The coefficient is found to be statistically significant as evidenced by an examination of the t–statistic value (–2.160825) and the corresponding probability value (0.0333). The result confirms that high interest rate has impact on cost of production, consumers' purchasing power and profitability of businesses and banks.

The coefficient of exchange rate (EXR) is negative with a value of –0.359032. This implies that exchange rate negatively affects the ROE of Nigerian banks. The result also indicates that exchange rate with t-statistics value of –3.561095 and a corresponding probability value of 0.0006 is statistically significant at 5% level.

The coefficient of growth of money supply (GMS) is negative with the value of –1.287174. The coefficient of growth of money supply was statistically significant utilizing the t-statistic value of –2.761574 and the corresponding probability figure 0.0070.

The result of liquidity ratio reveals a positive and significant impact with a coefficient value of 0.887217. The significance level of the coefficient is confirmed by the t–statistics value of 3.078290 and corresponding probability value of 0.0028.

Policy Implications

Findings showed changes in real GDP growth rate and inflation have insignificant impact on bank financial performance. However, changes in lagged GDP growth rate, interest rate, exchange rate, gross money supply and liquidity all have vital impacts on bank financial performance.

Due to significant impact of changes in most of the macroeconomic variables on banks' operations and financial performance, it is important for Nigerian banks to play very important roles in the formulation of macroeconomic policies that affect them.

CONCLUSION AND RECOMMENDATIONS

According to the study, a relatively stable macroeconomic environment is likely to promote better profitability for banks than in a volatile macroeconomic environment. While, volatilities allow creativity and provide avenues for improved profitability, consistent volatilities in the economy may also impact profitability quite negatively.

Therefore, the research recommends that when creating and putting strategic plans into action, Nigerian banks should strategically consider how changes in macroeconomic conditions may affect their operations and financial performance. This would require routine environmental scanning to align their behaviors with economic trends.

A policy dialogue between the banks and the federal government is also required to make sure that the banks are involved in the development of policies that could affect their activities.

The paper recommends more investigation into this topic, using different variables to further investigate the subject matter.

AUTHOR CONTRIBUTIONS

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