



Macro-economic Variables and Bank Performance in Nigeria: Fourth Republic Perspective

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Abstract: The vagaries of the macro-economic variables make business environment unpredictable and this often portends mammoth implications for various businesses, especially, a critical business such as banking, which the successive governments within the fourth Republic have strived to jealously protect. Therefore, in this study, the impact of macroeconomic factors on the performance of Nigerian banks from 1999 to 2021 was assessed. Data for the study's time period came from the World Bank reports as well as the Statistical Bulletins of the CBN and SEC. To evaluate the data, an ARDL (Autoregressive Distributed Lag) model was employed. Findings showed that, in the long run, lending interest rates had a negative and statistically insignificant impact on the performance of Nigerian banks with a coefficient of -0.0422 (p-value = 0.3860 > 0.05), in contrast to the unemployment rate, which had a negative but statistically significant impact with a coefficient of -0.0534 (p-value = 0.0012 > 0.05); furthermore, gross domestic savings in Nigeria maintained positive and strong relationship with banks performance in the long run with coefficient 0.7970 (p-value=0.0002<0.05). Moreover, finding showed that GDP Per capital income insignificantly stimulated the performance of the banks with coefficient 0.3038 (p-value=0.0963>0.05) while exchange rate was found to be positively and significantly associated with the performance of the banks with coefficient 0.8073 (p-value=0.0334<0.05). In addition, the variables converged in the long run at a speed of 151% with a statistically significant p-value =0.0034<0.05; the Heteroscedasticity test and the Autocorrelation test respectively revealed that the model residuals were Homoscedastic and uncorrelated. Sequel to these findings, the study concluded that while lending interest rate and unemployment rate impeded banks' performance, gross domestic savings, GDP per capital income and exchange rate facilitated banks' performance in Nigeria. Accordingly, it was suggested that government should create jobs via industrialization that is matched with locally available inputs, especially in the areas of agriculture so as to firmly address the galloping unemployment rate that is impeding banks performance in the fourth Republic of Nigeria.

Keywords: Banks' performance; lending interest rate; Domestic savings; Unemployment rate

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1. Introduction

Any economy's development and growth depend heavily on banks. As a result, it is referred to as the brain of a market economy. Their primary function in deposit mobilization facilitates the flow of surplus funds from household units to the economy's productive sector. Moreover, banks perform these roles of deposit mobilization and credit extension within the confine of macro-economic environment. And considering the vagaries of the Nigerian macro-economic environment, it is needless to emphasize that Nigerian banks operations take place in a turbulent macroeconomic environment which may impact their performances. Hence, weak macroeconomic environment or performance has the high tendency of incapacitating the banks from performing their mandates, and consequently endangers the deposit mobilization and credit allocation activities of the banks.

Obviously, the Nigerian economy, within which banks operate, suffers from macro-economic instability. Interest rate, which is predominantly the source of income to banks, is not stable and is subject to market demand and supply forces and the monetary policy direction of the CBN; incidentally, the Monetary Policy Rate, which is the anchor rate, has witnessed adjustment twice in 2022 alone by the Central Bank of Nigeria's Monetary Committee, in response to the ravaging inflationary pressure; firstly from 11.5% to 13% in May (Emejo & Ekeghe, 2022), and from 13% to 14% in July (Olawoyin, 2022). Worse still, inflation, is hovering around 19.64% on a year-on-year basis as at July 2022 remains the highest in a decade, and represents about 26% increase from 15.60% inflation rate as at January 2022 (National Bureau of Statistics [NBS], 2022). In the like manner, exchange rate is fluctuating and suffocating in Nigeria on daily basis due to nefarious activities of the black marketers and speculators. The exchange rate of Naira to Dollar as at 19th August, 2022 is N685 in the parallel market (Onye, 2022), and this represents about 19% increase from N575 per Dollar at 1st of January 2022 (Adegbesan, 2022). All these macro-economic indicators have direct bearing to the businesses, including banking and hence, impact on banks' performance.

Furthermore, Studies have also revealed that macroeconomic factors like inflation can have an impact on how profitable DMBs are (Adetokun et al., 2021). Additionally, Ejem et al. (2020), referencing Adler and Dumas (1980), demonstrated that the actions of banks are subject to exchange rates since the volatility of asset value is dependent on exchange rates. Sayedi (2013), however, stated that in the absence of stable interest rates, domestic and international investors will shun the market and resources will be directed elsewhere. According to economic evidence of investment behavior, uncertainty and macroeconomic instability have a large and negative impact on private investment in addition to traditional determinants like historical economic activity growth, real interest rates, and private sector credit.

1.1. Statement of the Problem

The empirical analyses of the relationship between Nigerian banks' performance and the behaviour of macro-economic indicators are not new in the literature. Indeed, quite a great deal of research has been conducted in this area with conflicting results reported based on the research approach and strategies adopted by existing authors. It is however instructive that preponderance of the existing studies over-concentrate on measuring the performance of the banks with financial ratios such as returns on asset, return on equity and returns on capitals employed with attendant neglect of other performance metrics (Popoola & Sunday, 2019; Anshu & Ghakhar, 2019; Adetokun, Abdulkamaru & Pam, 2021; Ejem et al., 2020). Although, authors like Adiga, Haruna, Yua and Adigwe (2020) measured banks' performance with net interest margin while Ani, Ugwunta and Imo (2012) as well as Floyd (2020) considered return on equity as a measure of banks' performance, none of the existing studies, to the best of my knowledge, has measured banks' performance with absolute naira value of profit before or after tax which is another recommended, quick, crucial and efficient indicators of banks' performance according to NDIC (2018). Furthermore, existing studies have excessively focused on a handful of the macroeconomic variables such as inflation rate, exchange rate, interest rate and GDP (Ejem, Ogbonna & Ogbulu, 2020; Adetokun et al, 2021; Anshu & Ghakhar, 2019), whereas, there are other macro-economic variables such as GDP per capita income, gross domestic savings and unemployment rate which are crucial and equally influence banks performance. Thus, literature is replete with measuring banks performance with outcome of ratio analysis and some preferred macro-economic indicators; whereas, these metrics suffer limitation in terms of multiple definition and subjective interpretations, thereby distorting the true wealth of the banks. Consequently, in order to fill the foregoing gaps, the present study digresses from the trends in the existing studies and measures banks' performance with total loan and advances granted to various sectors of the economy. Also, against what is popular in the literature, macro-economic indicators, such as GDP per capita income, gross domestic savings and unemployment rate and lending interest rate are considered in this study. Following the aforementioned problems, this study raises the following questions to aid investigation of the effect of macro-economic variables on banks' performance in Nigeria: What is the effect of interest rate on banks' performance in Nigeria? How does GDP per capita income affect banks' performance in Nigeria? What is the effect of unemployment rate on banks' performance in Nigeria? How do gross domestic savings affect banks' performance in Nigeria? What is the relationship between exchange rate and banks' performance in Nigeria?

H0₁: Interest rate has no significant effect on banks' performance in Nigeria

H0₂: GDP per capita has no significant effect on banks' performance in Nigeria

H0₃: Unemployment rate has no significant effect on banks' performance in Nigeria

H0₄: Gross domestic savings have no significant effect on banks' performance in Nigeria

H0₅: Exchange rate has no significant relationship with banks' performance in Nigeria

Obviously, there are so many banks operating in Nigeria's financial landscape and numerous macro-economic indicators abound in Nigerian economy. However, in the interest of this study, attention is focused on the Deposit Money banks which are the largest form of banks in Nigeria. In addition, among the prevalent macro-economic variables, GDP per capita income, interest rate, unemployment rate and gross saving deposit are the focus of this study from 1999 to 2021. This period is chosen based on the availability of data and the time frame within which this study has to be concluded.

2. Literature Review

2.1. Conceptual Review

2.1.1. Macro-economy and Macro-economic Variables

According to Anshu and Ghakhar (2019), macroeconomics is the study of a country's total economy. This is accomplished by evaluating an economy's overall performance by looking at a few macroeconomic variables. It discusses seasonal patterns in the gross domestic product, price level, currency rate, interest rates, money supply, budget deficit, and unemployment, among other things. Indeed, macro-economy is concerned with the management of the entire economy which affect every sector and over which no single person has control. These scholars further posited that When Adam Smith published "The Wealth of Nations" in 1776, along with David Ricardo (1772–1823), Thomas Robert Malthus (1766–1834), and John Stuart Mill (1806–1873), microeconomic and macroeconomic behavior were not thought to be distinct until the 1930s. The traditional school of thought in economics held that the market would automatically interact with pricing flexibility to react to any disruption.

The state of macro-economy is usually revealed by some indicators known as macro-economic variables, which according to Adidu and Olanye (2006) remain outside the control of any business organization, including political, supplier, competitor, social, economic regulations. Along this line, Kwon and Shin (1999) argued that GDP, exchange rate, interest rate, inflation and market risk are very important macro-economic variables. Some of these factors are output of an economy, unemployment, inflation, savings and investment etc. Buttressing the foregoing, Khalid et al., (2012) attested that these factors are major performance driver of an

economy and are closely examined by each government, while Mankiw and Ball (2010), Broadstock et al., (2011) and World Bank Group (2015) affirmed that GDP, Exchange rate, CPI, interest rates, corporate tax, stock market index and other monetary regulations were continuously utilized to judge the macroeconomic indicators.

In addition, Brinson et al (2009) while providing insight on macro-economic variables and in confirmation of the position maintained earlier by Adidu and Olanye (2006), viewed Macro-economic variables are those that pertain to a national economy and have an impact on the entire region rather than just a few chosen people. Major factors identified by the study included inflation, the GDP, interest rates, currency exchange rates, the legal system, and regulatory framework risk. According to Sharma and Singh (2011), while making financial decisions over a longer period of time, the majority of enterprises typically take the stability and favorability of macroeconomic variables into account. From the views reviewed so far, it is apparent that the importance of macro-economy cannot be overemphasized, and that there are numerous macroeconomic indicators which can reveal the condition of a macro-economy. However, this study is concerned with interest rate, unemployment rate, exchange rate, GDP per capita income and domestic savings.

Relating interest rate to banks' performance, According to Enyioko (2012), interest rate policies have had a minimal impact on the expansion of the economy and have not greatly benefited the overall performance of banks. Because banks' profit before tax serves as a stand-in for their performance in this study, the interest rate is measured as one of the macroeconomic factors. Moreover, connecting exchange rate to banks' performance according to Adiga, Haruna, Yua, and Adigwe (2020), the fluctuation of foreign currency rates is a potentially fascinating aspect that influences deposit money banks' level of profitability by impacting their financial intermediation process. Changes in exchange rates could pose a danger to both a business and a bank that accepts deposits. Huge losses in foreign exchange can cause businesses to fail as well as place a tremendous burden on profitability. As a result, Lagat and Nyandema (2016) and Taiwo and Adesola (2013) found a link between exchange rate volatility and financial performance and that this association could put deposit money institutions' profitability at risk. Hence, this study measures exchange rate to assess its effect on total loans and advances as a measure of banks' performance. From the foregoing attestations that exchange rate has connection with banks' performance, there is need to carry out the present study to properly understand the nature of the relationship between exchange and banks' performance in the context of measuring banks; performance with on total loans and advances.

In addition, between 2015 and 2019, the gross savings by the deposit money banks amount to N11,458.13bn, N12,320.23bn, N12,965.06bn, N15,316.02bn and N17,301.03bn respectively, and when these are compared to their total assets, they

represent 40%, 38%, 37%, 40% and 42% of the banks' assets respectively (CBN, 2019). Also, between 2020 and 2021, gross domestic savings increased by about 23% from N20,841.84bn to N25,648.26; in the same vein, total credits granted by the banks during the same period moved up by 19% from N20,373.43bn to 24,378.19bn (CBN, 2021). The foregoing implies that savings is a notable ingredient that propel banks performance because without savings, there would be nothing for the banks to lend; by implication, no interest incomes can be earned without savings deposits with the banks. Hence, any significant fluctuation in the volume and quality of national savings (which is usually cause by interest rate occasioned by the monetary policy as well as market forces) has the tendency of affecting the banks' ability to grant credits to customers, and this would by extension, impact negatively on the performance of the banks in terms of decline in profitability occasioned by decline in credit extension. This is because investment by the banks and other investing public is a function of saving deposits received. Consequently, decline in savings implies decline in banks' investment in terms of lending and taking position in other safe securities. Thus, this study thus evaluates gross savings to in relation to banks' performance so understand its effect on the performance of banks in Nigeria.

Also according to Salami (2021), while the industrial sector's employment output is still unattractive, the unemployment rate is predicted to reach nearly 40% by the end of 2021. He further submitted that the youth unemployment is presently at 40%. Theoretically, high unemployment rate affects all sectors of the economy and brings about lull in business activities by lowering purchasing power and demand for goods and services. With youth employment at 40%, obviously, such jobless youths cannot think about opening bank accounts nor having security to guarantee borrowing from banks. To this end, it is important that empirical investigation is carried out to unravel the true nature of unemployment on banks' performance as measured by total assets, deposits, loans and profit before tax of the banks.

Moreover, Salami (2021) estimates that the inflation rate was 17.38% in July 2021, up from 16.5% in January 2021, and that food prices were up 21.03%. Therefore, Uboh (2005), who was quoted by Adetokun, et al. (2021), argued that research has also indicated that inflation can have an impact on the DMBs' performance. As a result, Revell (1979) remarked that how inflation affects a bank's profit margin has an impact on the salaries and other operating costs of the bank. Therefore, as inflation rates rise, salaries and operational costs may as well reduce the profitability of the bank. On the other hand, if the inflation rate is fully anticipated, banks can adjust interest rates in a way that maximizes profit. Furthermore, although inflation and bank performance are positively correlated, according to studies by Bourke (1989) and Molyneux and Thornton (1992), there is need to corroborate or contradict the foregoing position which accounts for while one of the objectives of the present study is aimed at investigating the effect of inflation on profit before tax, total assets, total mobilized deposit and total loans granted unlike previous studies. Not only this,

currently in the literature, uncertainty exists in the relationship between rising GDP and operational costs for banks. According to Bolt et al. (2012), unfavorable economic conditions, such as slower GDP growth rates, may lead to a decline in deposits, loans, and the costs associated with managing them. These circumstances might make recovering loan payments more expensive. This study thus becomes imperative so as to reveal the connection between GDP per capita income and banks' performance, which unlike existing study is measured by profit before tax, total assets, total mobilized deposit and total loans granted by the banks.

2.2. Theoretical Framework

2.2.1. Market Power Model

This study also has direct bearing to the Bikker and Boss (2008) built the Market Power Model. In actuality, the Bikker and Boss model heavily references the broad theory of profit maximization. According to the market power model (Bikker & Boss, 2008), changes in the environment and competitor behavior have an impact on how well banks perform. The study takes into account the structure conduct performance (SCP) and efficient-structure (EFS) hypotheses, two variations of the market power model. According to the Structure-Conduct-Performance (SCP) paradigm, if there is no industry-wide collusion, bank profitability should be declining as market concentration (HHI) increases. However, if bank earnings are rising together with industry concentration, it follows that businesses are working together to maximize oligopoly profits. According to the Structure-Conduct-Performance (SCP) model, market structure impacts bank behavior, which has an impact on profitability. Banks are more inclined to engage in collaborative conduct and their oligopoly rents boost profitability in a more concentrated market (Bikker and Bos, 2008). It can be observed that the market power model is enough to explain the relationship between the performance of banking institutions and their macroeconomic surroundings in Nigeria because banks operate within the macro-economy.

2.3. Empirical Review

Macroeconomic variables and the performance of Nigerian deposit money banks from 1989 to 2018 were examined by Ejem et al. (2020). Returns on assets were used as a proxy for banks' performance, which is why the gross domestic product rate, interest rate, inflation rate, money supply, and exchange rate were chosen as independent variables. The Generalized Method of Moment and Vector Error Correction Model were used to estimate the required model. It was discovered that none of the selected macroeconomic variables had a discernible impact on banks' performance, and that neither the variables' individual nor collective effects on

banks' performance—in the short and long terms—could be attributed. Furthermore, the study discovered that bank performance was not significantly impacted in response to the shocks of any chosen macroeconomic factors based on the impulse response estimation. This study however did not measure bank performance in terms of loans and advances as done in the present study.

From 1985 through 2019, Adetokun et al. (2021) investigated the impact of specific macroeconomic variables on the performance of Nigeria's deposit money institutions. Return on Asset (ROA) was used as a proxy to quantify the performance of deposit money institutions, with interest rate, money supply, inflation rate (INF), and real gross domestic product (RGDP) serving as the independent variables. Thus, in comparison with work of Ejem et al. (2020) this study excluded exchange rate from their estimated model. Data were collected from the secondary source and analyzed using vector error correction method. The findings indicated that while money supply and real gross domestic product had a negative impact on return on assets, interest rates and inflation rates showed favorable associations with return on assets. Thus, it was determined that over time, interest rates and inflation rates influenced bank performance more so than money supply and real GDP.

Anshu and Ghakhar (2019) assessed the impact of macroeconomic variables on financial performance of Indian banking sector from 2000 to 2017. Return on assets was the proxy for banking sector performance as dependent variable why inflation rate, GDP, interest rate and exchange rate were the independent variables proxies for macro-economic variables. Data were sourced from the secondary sources such as Handbook of Indian Statistics, National Statistics portal, Federal Reserve bank, World Bank and Indian Trading Economics. Analysis of the collected data was done via multiple regression and as well as the descriptive statistics. Findings revealed that inflation rate and interest rate positively and significantly affected returns of assets of the banking sector. On the other hand, GDP was also positively related with returns on assets but its coefficient was insignificant. Exchange rate was however, negative and significantly related to return on assets. The study however failed to incorporate exchange rate unlike the preset study that take cognizance of the effect of exchange rate in respect to the foreign exchange transactions of the banks in Nigeria.

Abisomwan (2018) studied the nexus between macroeconomic performance and banking Industry performance in Nigeria. Survey research design was adopted in the study while questionnaires were administered to collect primary data from 120 bank branches with a customer base of about 2400 in Nigeria. Analysis of data was carried out by employing the Generalized Method of Moments technique while hypotheses testing was done at 1% significance level. Findings showed that macroeconomic performance positively impacted on the financial performance of the Nigerian banking industry while performance was found to be significantly predicted by sex

and employment status, such that female managers appeared more profitable than their male counterparts; also, it was found that the higher the status of employment of the managers, the better their abilities to drive their banks' profitability. This submission thus aligns partially with that of Anshu and Ghakhar (2019) that macroeconomic variables are strategic to effective performance of the Nigerian banking sector, and disagrees with Ejem et al. (2020) who submitted that macroeconomic variables had no significant effect on banks performance.

Another useful insight was provided in the study of Chidozie and Ayadi (2017) on the relationship between Macro-economy and Banks' Profitability in Nigeria. The CBN's Statistical Bulletin of various editions was used to collect the data, which was then analyzed using a panel regression technique. The results showed that total assets was favorably significant in predicting return on average equity as a proxy for banks' profitability, whereas the ratio of cost to income, market concentration, and crude oil price were adversely significant in affecting changes in return on average equity. Based on these findings, it was advised that due to the large impact of crude oil price on banks' profitability, exposure of banks to the oil and gas sector merits special attention.

The impact of specific macroeconomic variables on the profitability of deposit money banks in Nigeria was explored by Adiga, Haruna, Yua, and Adigwe (2020). Multiple linear regression was specified for the study in which net interest margin as measure of banks' profitability was expressed as a function of selected macroeconomic variables such as exchange rate, inflation rate, interest rate and Gross Domestic Product. Data were collected from the secondary sources. Analysis of the data was done via ordinary least square multiple regressions was used to analyze the data; results showed that all the selected macroeconomic variables were not significant predictors of Net interest margin. It was therefore concluded that the selected macroeconomic variables were not a significant predictors of the Nigerian deposit money banks' profitability for the period covered by the study.

Popoola and Sunday (2019) looked into how the financial performance of deposit money banks in Nigeria from 2005 to 2014 was influenced by firm-specific characteristics and macroeconomic factors. To estimate the specified model, data were analyzed using the multiple panel regression technique together with random effects. The findings showed that while Capital Strength was found to have been weak, bank-specific features like Fund Source, Loan Quality, Liquidity, Management Quality, and Direction of Efforts considerably improved the financial performance of the banks. Additionally, it was discovered that the annual loan rate, inflation, and economic growth were all important variables that affected the financial performance of deposit money banks in Nigeria over the course of the study. The submission in this study however, contradicts the one made by Adiga,

Haruna, Yua and Adigwe (2020) who submitted that macroeconomic variables had no significant effect in predicting banks' performance in Nigeria.

Between 2005 Q1 and 2020 Q3, Floyd (2021) evaluated the impact of macroeconomic factors on the asset positions and financial performance of non-banking financial institutions (NBFIs) in Jamaica. Quantitative information was gathered from secondary sources, and the autoregressive distributed lags model's cointegration and error correction models were used to analyze the data. The findings indicated that real gross domestic product and unemployment rate had positive long-term relationships with return on assets; additionally, interest rates and stock market growth had positive long-term relationships with return on equity; and finally, it was found that all the independent variables had sustained long-term causal relationships with total assets. With return on assets, return on equity, and total assets, the short-run causal linkages between variables were minimized.

In concluding this section, and having traversed the literature to x-ray the views of scholars as related to this study, it is undoubtedly clear that within the fourth republic of Nigeria, authors have not explored the effect of some macro-economic variables such as GDP per capita income, domestic savings, interest rate and unemployment rate on banks' performance, measured by total loans and advances in Nigeria. Furthermore, it is also crystal clear that in the area of measuring banks' performance, good and bank-mandate compliant indicator like total credits created by the banks has not been used to gauge banks performance against NDIC recommendation. The aforementioned submissions therefore leave huge gaps in the literature, and unless the gaps are properly filled, literature on the effect of macro-economic variables on banks' performance cannot be said to be complete; and accordingly, no unanimous consensus can be made. Finally, from the above, literatures have equally established a connection between macro-economic indicators selected in this study and banks performance, and this necessitate while this study has to be carried out to reveal the relationship between macro-economic variables and the performance of the banks in the context of total loans granted which previous scholars have not explored but had equally been affirmed as a good indicator of banks' performance according to NDIC (2019).

3. Methodology

Research Design

Since the event being investigated in this study has occurred in the past, therefore, this study adopted ex post facto research design and collected quantitative data to measure the effect of macro-economic variables, which are the independent variables on banks' performance, which is the dependent variable. This research design

method was chosen to facilitate the answering of the research questions and the eventual accomplishment of the stated objectives.

Model Specification

This study adapted the model estimated in Adiga et al. (2020) to suit the purpose of this study. Consequently, the linear model expressing the relationship between macro-economic variables and banks' performance is specified thus:

$$BP = f(\text{SMEV}) \quad \text{Eq (3.1)}$$

Where BP connotes banks' performance and MEV connotes selected macro-economic variables.

Expanding Eq (3.1) and introducing proxies for macro-economic variables and banks' performance, Eq (3.1) becomes:

$$\text{TLAB} = f(\text{LIR, GDPPC, UER, DSAV \& EXCR}) \quad \text{Eq (3.2)}$$

For ease of estimation, Eq (3.2) can be transformed into econometric form as follows:

$$\text{TLAB} = \beta_0 + \beta_1\text{LIR} + \beta_2\text{GDPPC} + \beta_3\text{UER} + \beta_4\text{DSAV} + \beta_5\text{EXCR} \quad \text{Eq (3.3)}$$

The above Eq (3.3) is expressed in Autoregressive Distributed Lags model thus:

$$\Delta \ln \text{TLAB}_t = \beta_0 + \beta_1 \text{LIR}_{t-1} + \beta_2 \ln \text{GDPPC}_{t-1} + \beta_3 \text{UER}_{t-1} + \beta_4 \ln \text{DSAV}_{t-1} + \beta_5 \ln \text{EXCR}_{t-1} + \sum_{i=1}^p \theta_i \Delta \ln \text{TLAB}_{t-i} + \sum_{i=1}^q \gamma_i \Delta \text{LIR}_{t-i} + \sum_{i=1}^q \lambda_i \Delta \text{GDPPC}_{t-i} + \sum_{i=1}^q \phi_i \Delta \text{UER}_{t-i} + \sum_{i=1}^q \delta_i \Delta \text{DSAV}_{t-i} + \sum_{i=1}^q \alpha_i \Delta \text{EXCR}_{t-i} + \Psi \text{ECM}_{t-1} + U_t \quad \text{Eq (3.5)}$$

Description and Measurement of Variables

Variables in Eq (3.3) are measured as follows:

TLAB = Total loans and advances of the DMBs, which is measured as the gross value of the total credits granted to various sectors of the economy.

LIR: Prime lending interest rate, which is measured by the market prime lending rate as published by the CBN

GDPPC = this is the gross domestic product or the total output of goods and services produced in Nigeria by both resident and non-resident individuals divided by the population of the country

UER = this is the rate of people who are willing and able to work but cannot get a job in Nigeria.

DSAV = this is the summation of all savings or deposits made with Nigerian banks on an annual basis

EXCR= this is the rate at which naira exchanges for other currencies, usually Dollar. It is the amount of naira required to buy one unit of foreign currency.

β_0 = regression constant

$\beta_1 - \beta_5$ = coefficients of the parameters to be estimated or regression intercepts

A Priori Expectation

The nature of the relationship of each of the macro-economic proxies in equation 3.3 with profit before tax of banks is expectedly stated thus:

$\beta_1 < 0$ or > 0 i.e Negative/Positive

$\beta_2 > 0$ i.e Positive

$\beta_3 < 0$ i.e Negative

$\beta_4 > 0$ i.e Positive

$\beta_5 < 0$ i.e Negative

Sources of Data

As earlier noted, in order to aid the estimation of equation 3.5, quantitative data were collected from CBN's Statistical Bulletin from 1999 to 2021. The choice of this source was informed by its validity and reliability since the author of the Bulletin is an accredited government agency which oversees the economic at both macro and micro levels.

Method of Data Analysis

Estimation technique chosen in this study was Ordinary Least Square due to its ability to estimate parameters with minimum variance and its acclamation as the Best Linear Unbiased Estimator among other estimators.

4. Results and Discussions

The analysis of data, interpretations and discussion of findings in respect of this study are presented in this section.

Descriptive Statistics Summary

The study used descriptive statistics to check the nature of the data series collected for each variable and the results are contained on Table 1 thus:

Table 1. Descriptive Statistics Results

	LTLAB	LIR	UER	LDSAV	LGPPC	LEXCR
Mean	8.508332	17.36415	12.20826	8.250608	7.384080	5.124326
Median	8.961802	16.93750	13.30000	8.689695	7.614805	5.012620
Maximum	10.10144	24.85000	33.30000	10.15223	8.038835	5.991374
Minimum	5.776924	11.55463	3.590000	5.626424	6.210600	4.529297
Std. Dev.	1.295775	2.727319	9.325757	1.442507	0.568878	0.425047
Skewness	-0.688765	0.414311	0.593299	-0.470998	-0.909342	0.748818
Kurtosis	2.162116	4.609387	2.166764	1.782042	2.414359	2.297955
Jarque-Bera	2.491320	3.140212	2.014701	2.271994	3.498479	2.621788
Probability	0.287751	0.208023	0.365185	0.321102	0.173906	0.269579
Sum	195.6916	399.3755	280.7900	189.7640	169.8338	117.8595
Sum Sq. Dev.	36.93871	163.6419	1913.334	45.77821	7.119692	3.974625
Observations	23	23	23	23	23	23

Source: Author's Computation (2023)

Table 1 unambiguously shows that all the research variables have their mean values lying between the minimum and the maximum values, with lending interest rate having the highest mean value of 17.34 while the lowest mean value of 5.12 was associated with exchange rate (EXCR). In addition, a closer look at Table 1 also shows that all the variables have their standard deviation values very low, which connotes low risk and that all the data sets collected in this study were closer to their mean values. This is however with exception to unemployment rate with a wide and certainly highest standard deviation value of 9.32 from the mean value of about 12.20. The Kurtosis result shows that lending interest rate (LIR) was leptokurtic and peaked curve while all other variables were platykurtic and having flatted curves. The Skewness of the collected observations showed that LIR, UER and EXCR were positively skewed and their distributions normal and symmetrical around their mean values; on the other hand, TLAB and DSAV were negatively skewed and by implications, their distributions have long left tail with lower than sample mean values. Furthermore, Jarque-Bera normality test showed that all the variables' distributions were normal since their p-values were higher than 0,05 critical value, suggesting that the null hypothesis of normal distribution cannot be rejected.

Table 2. Correlation Matrix

	LTLAB	LIR	UER	LDSAV	LGPPC	LEXCR
LTLAB	1					
LIR	-0.3513	1				
UER	-0.1445	-0.6007	1			
LDSAV	0.5557	-0.6370	0.0519	1		
LGPPC	-0.6011	-0.1477	0.2267	-0.0027	1	
LEXCR	0.4432	0.0758	0.1574	-0.0657	-0.8792	1

Source: Author's Computation (2023)

Table 2 shows the degree of the relationship among the variables of this study. From Table 2, it is observable that LIR was negatively related to TLAB with -0.35, suggesting that a low negative relationship exists between lending interest rate and the banks' performance, measured by total loans and advances. This is a confirmation that high interest rate discourages borrowing from the banks and reduces the lending activities of the banks. Unemployment rate (UER) also was negatively related to performance of the banks with correlation coefficient of -0.14, suggesting a weak negative relationship and a confirmation that unemployment would reduce lending activities of the banks as earned incomes and by extension, deposits inflows to the banks, nosedive due to high unemployment rate. DSAV was positively and strongly correlated to TLAB to the tune of about 56%, meaning that domestic savings and total credit of the banks moves together in the same direction, a confirmation that deposit is a strong factor in determining the lending volume of the banks since deposits are usually translated to credits by them. Also, with 60% correlation coefficient, the GDP per capita was negatively associated with performance of in contradiction of the a priori expectation. Moreover, EXCR was weakly but positively related to TLAB, such that they move together with 44% magnitude; which may be due to encouragement of foreign investment inflow into Nigeria as more naira exchange for other currencies and this would also necessitate borrowing from locals' banks as more naira would be needed to bring in raw materials inputs as well as other imports from abroad.

Table 3. Unit Root Test

H0: Each variable has a unit root; **H1:** H0 is not true

Variable	Philips Perron Unit root test			Augmented-Dickey-Fuller Unit root test		
	Critical value @5%	Philips Perron test statistics	Order of Integration	Critical value @5%	ADF-test Statistics	Order of Integration
TLAB	-3.00436	-3.172493*	I(0)	-3.02997	-3.822639	I(0)
LIR	-3.00436	-1.729654	-	-3.00486	1.816355	-
UER	-3.00436	2.001801	-	-3.00486	1.517540	-
DSAV	-3.00436	-2.094170	-	-3.00486	2.379526	-
GDPPC	-3.00436	-2.481104	-	-3.00486	2.745368	-

EXCR	-	0.542074	-	-	0.734384	-
	3.00436			3.00486		
	1			1		

Notes: *Denotes significance at the 5% level and the rejection of the null hypothesis of non-stationarity.

Source: Author's Computation (2023)

Table 3b. Unit root test results at first differences

Philips Perron Unit root test			Augmented-Dickey-Fuller Unit root test			
Variable	Critical value @5%	Philips Perron test statistics	Order of Integration	Critical value @5%	ADF-test Statistics	Order of Integration
TLAB	-	-	I(0)	-	-	I(0)
	3.01236			3.01236		
	3			3		
LIR	-	-	I(1)	-	-	I(1)
	3.01236	6.204093		3.01236	5.679350	
	3	*		3	*	
UER	-	-	I(1)	-	-	I(1)
	3.01236	3.378240		3.01236	3.380771	
	3	*		3	*	
DSAV	-	-	I(1)	-	-	I(1)
	3.01236	3.658336		3.01236	3.658336	
	3	*		3	*	
GDPPC	-	-	I(1)	-	-	I(1)
	3.01236	3.085807		3.01236	3.042159	
	3	*		3	*	
EXCR	-	-	I(1)	-	-	I(1)
	3.01236	3.203661		3.01236	3.219107	
	3	*		3	*	

Notes: *Denotes significance at the 5% level and the rejection of the null hypothesis of non-stationarity.

Source: Author's Computation (2023)

As revealed on Table 3a, all the variables were not stationary at levels as majority of them have unit root except TLAB. This led to their first differencing as contained on Table 3b; in which case, every other variable became stationary, suggesting that the research variables are mixture of I(0) and I(1) integration order. By this finding, Autoregressive Distributed Lags model proposed by Pesaran, Shin and Smith (2001) is appropriate for estimating the study's model.

ARDL Model Dynamic Stability Test

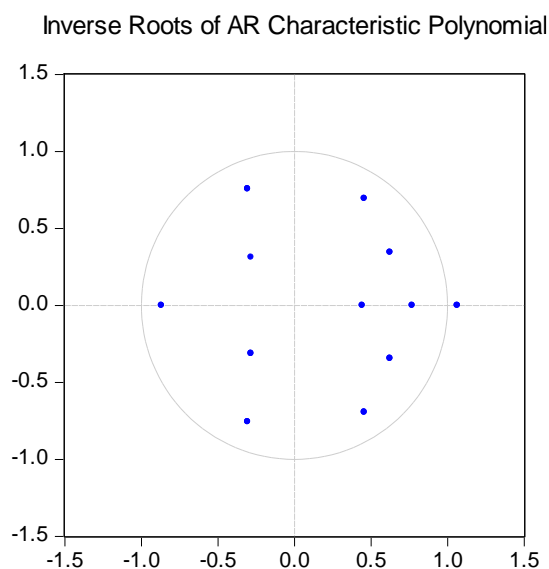


Figure 1. Dynamic Stability Test for ARDL Model

From Figure 1 helps to reinstate the extent of stability of the estimated model in this study. Hence, it is perceptible that all the inverse roots with respect to the model are encircle within the polynomial circle unit except one; this attests to the strength of the stability in the model that was estimated and supports the validity of the conclusion reached from the estimates.

Optimal Lag Length Selection

Since ARDL models are usually lagged, there is a need for the determination of the optimal lag length for the study's variables. Consequently, the VAR order selection criteria was used and the result of this criteria as revealed by Table 4 confirms that, using Akaike Information Criteria (AIC), the optimal lag length for the variables of this study is 2.

Table 4. VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-83.45128	NA	0.000202	8.519169	8.817604	8.583937
1	55.57455	185.3678 *	1.30e-08	-1.292814	0.796231	-0.839438
2	115.0731	45.33221	4.13e-09*	-3.530768 *	0.348887 *	-2.688784 *

Source: Author's Computation (2022)

Cointegration Bound Test

To be sure that the study's variables move together in the long run, co-integrated test for ARDL model was carried out and the result is displayed on Table 5:

Table 5. Co-integration Bound Test Result

Test Statistic	Value	k
F-statistic	3.866420	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Author's Computation (2022)

From Table 5, F-statistic value is 3.87 which is greater than the lower critical value bound and the upper critical value bound at 0.05 significance level. This connotes that the test was conclusive and confirmed that the variables were co-integrated in the long run: Hence the next step is to estimate the long run coefficients.

Table 6a. Short-Run Coefficients with ARDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LTLAB(-1))	0.996789	0.240472	4.145141	0.0043*
D(LIR)	-0.038110	0.023068	-1.652080	0.1425
D(LIR(-1))	0.028059	0.023483	1.194883	0.2710
D(UER)	-0.036004	0.015179	-2.371987	0.0495*
D(UER(-1))	0.021523	0.013525	1.591347	0.1556
D(LDSAV)	0.418106	0.502449	0.832137	0.4328
D(LDSAV(-1))	-1.268085	0.456315	-2.778971	0.0273*
D(LGDPPC)	0.459060	0.249886	1.837082	0.1088
D(LEXCR)	1.219995	0.408089	2.989529	0.0202*

*LTLAB: log of total loans and advances of the deposit money banks; LIR: Lending interest rate; UER: Unemployment rate; LDSAV: log of gross domestic savings; LGDPPC: Log of GDP per capita income; LEXCR: log of aveargeexchange rate. Notes: * 5% level of significance*

Source: Author's Computation (2022)

Table 6a displays the result of the relationship among the variables in the short-run. according to this result, the current value of the LIR was negatively associated with TLAB while its first lag was negatively related to the TLAB; in each of these cases, LIR was a weak predictor of TLAB. For UER, its current value was negatively and significantly associated with TLAB unlike its first lag that displayed positive and weak relationship with TLAB. In addition, in its current value, DSAV was positive and weak in its relationship with TLAB while this relationship was reversed to weak

and negative in its first lag. Furthermore, DSAV in its first lag was negatively and strongly related to TLAB but having weak direct relationship with TLAB in its current values. Also, in the short run, GDPPC was directly related to TLAB in its current value while EXCR was significantly and positively related to TLAB in its current value. As earlier noted however, evidence of long run relationship has been revealed in this study; therefore, the study is more interested in the long run relationships on Table 6b than the short run relationships.

Table 6b. Error Correction Model (ECM) and Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LIR	-0.042220	0.045674	-0.924376	0.3860
UER	-0.053462	0.010272	-5.204750	0.0012
LDSAV	0.797007	0.115242	6.915970	0.0002
LGDPCC	0.303772	0.158173	1.920499	0.0963
LEXCR	0.807301	0.209980	3.844650	0.0063
ECM(-1)	-1.511201	0.348302	-4.338773	0.0034
C	-3.010699	1.139960	-2.641057	0.0334

TLAB, LIR, UER, LGDPCC, LEXCR are as previously defined under Table 6a.

*Notes: * 5% level of significance*

Source: Author's Computation (2022)

From Table 6b which contains the summary of the long-run coefficients of the estimated parameters, it is noticeable that in the long run, LIR eventually maintained negative but insignificant relationship with TLAB in line with the short run effect. To this extent, a 1% change in LIR was linked to about 4.2% opposite change in the TLAB. Unemployment rate equally retained its strong effect on TLAB in the long run, just the same way its current value strongly determined TLAB in the short run. This means that in the short run and long run, UEM rate was stable as a negative influencer of TLAB; hence, should UER be increased by 1%, its resultant effect on TLAB would be about 5% decrease and vice versa. Furthermore, DSAV, like in the short run, its current value was positively connected to the TLAB when the long run effect is considered; however, unlike the short run effect, its effect on TLAB was reversed from weak to strong in the long run; hence, 1% increase in DSAV produced about 80% increase in the TLAB in Nigeria; the reverse of this was equally true. In addition, GDPPC was stable in its weak relationship in the long run as it also maintained direct relationship with TLAB; this implied that for every 1% change in GDPPC, it would culminate in about 30% insignificant change in TLAB and in the same direction. For EXCR, the result on Table 6a shows that its significant and positive relationship with TLAB in the short run was repeated in the long run, such that EXCR produced about 81% change in TLAB for every 1% change in its value and vice versa.

The Error Correction Mechanism (ECM) is reported on Table 6b to be -1.51; this connotes that any shock experienced by the variables which causes disequilibrium

in the short run would be corrected at the speed of 151%. The statistical significance of this result is attested to by the p-value which is 0.0034, implying that the variables converge on the long run at a high speed from their disequilibrium state.

Test of Hypothesis and Discussion of Findings

Decision Rule

The decision rule in testing hypothesis states that the null hypothesis is rejected when $p\text{-value} \leq 0.05$, otherwise the null hypothesis cannot be rejected.

H0₁: Interest rate has no significant effect on banks' performance in Nigeria

H1₁: Interest rate has significant effect on banks' performance in Nigeria

From Table 6b, the p-value of lending interest rate is 0.3860 which is higher than the critical value at 0.05 significance level; hence, null hypothesis cannot be rejected. Therefore, this study concludes that lending interest rate has no significant effect on banks' performance in Nigeria.

In addition, the lending interest in this study aligns with theoretical expectation of negative relationship with performance of banks, especially as measured by the total credits granted by the banks to the various sectors of the economy. This is a confirmation that high interest rate discourages borrowing and thus lower banks performance while lower and affordable lending interest rate facilitates banks' performances by promoting lending activities due to increased demand for borrowing as spurred by affordable lending interest rate of the banks. This finding corroborates Ejem et al. (2020) who found that lending interest rate had insignificant negative effect on banks performance, measured by return on assets; but contradicts the submission of Adetokun et al. (2021) that lending interest rate has positive effect on banks performance. The reason for this contradiction must have been accounted for by the differences in the measurement of banks' performance as they made use of ROA as opposed to the present study that measures banks' performance with banks' credit portfolios which has direct bearing with lending interest rate.

H0₂: GDP per capita has no significant effect on banks' performance in Nigeria

H1₂: GDP per capita has significant effect on banks' performance in Nigeria

Equally, Gross Domestic per capita was found to be directly associated with banks performance. This confirms the expectation that prosperities in the economy would bring a lot of fortune to various sectors of the economy and spur more savings with banks and trigger more demands for investment capital from the banks by the productive sectors. Thus, this study has once again proved that a higher GDP growth implies a higher disposable and per capita income which positively influences banks' performance in terms of high credit expansion, low loan default rates, improved

saving deposits arising from reduction in unemployment due to economic prosperity. Confirming the foregoing finding is Adiga et al. (2020) as well as Anshu and Ghakhar (2019)' all of whom reported that GDP exerts positive influence on banks performance in Nigeria. Nevertheless, Adetokun, et al. (2021) who measured banks performance with ROA discovered a negative link of GDP with return on assets of the banks in Nigeria.

H0₃: Unemployment rate has no significant effect on banks' performance in Nigeria

H1₃: Unemployment rate has significant effect on banks' performance in Nigeria

In addition, Table 6b reveals that the p-value of unemployment rate is 0.012, which is less than the critical value at 0.05 significance level, the study rejects the null hypothesis and concludes that unemployment rate has significant negative effect on the performance of banks in Nigeria. The negative effect results from the decline in the potential savings and lack of demand for goods and services from teaming unemployed population, which according to Salami (2021), hit 40% by the end of 2021. Since no incomes are earned by this class of the labour force; it translates to reduction in banks' deposits, and consequently reductions in the performance of banks in terms of credit expansion to various sectors of the economy. The finding thus confirms the a priori expectation that increase in unemployment rate would reduce banks performance. To this extent, this finding contends with the finding of Ejem, et al. (2020) that macro-economic variables and this must have been due to differences in the econometric approach and banks' performance measurement adopted; unlike the present study, GMM estimation technique was employed by Ejem et al. (2020) while ROA was the proxy for banks' performance. Also, this study disagrees with Floyd (2021) who found out that unemployment rate has long –run positive relationship with banks performance; this was equally to due to measurement of banks' performance by financial ratio i.e ROA, even though the same ARDL used in this study was employed in Floyd (2021).

H0₄: Gross domestic savings have no significant effect on banks' performance in Nigeria

H0₄: Gross domestic savings have significant effect on banks' performance in Nigeria

Moreover, gross domestic savings has p-value of 0.0002; this is less than the critical value at 0.05 significance level. This study then concludes that gross domestic savings have significant positive effect on banks' performance in Nigeria. This corroborates the fact that lending is proportional to savings deposit mobilized by the banks since savings are usually transformed to loans and advances in accordance to asset transformation theory which posits that the core mandate of the banks is to

mobilize deposit and creates credit (asset) from the mobilized deposits. Hence, by this finding, the a priori expectation is confirmed that savings deposit are have strong positive influence on the performance of banks in Nigeria. This must have accounted for why lending increased by 19% in proportional to 23% increase in the domestic savings between 2020 and 2021 according to CBN (2021). Increase in savings would spur increase in investment; increase in investment would spur increase in demand for credits from the banks; while increase in the prudential lending would definitely result to increase in interest earnings, and this would produce spiral positive effect on the profitability of the banks; this is to establish that savings cannot be divorced from the macro-economic indicators that influence banks performance in Nigeria.

H0₅: Exchange rate has no significant relationship with banks' performance in Nigeria

H0₅: Exchange rate has no significant relationship with banks' performance in Nigeria

Furthermore, exchange rate is very significant in promoting the performance of the banks according to finding in this study. With $p\text{-value} = 0.0063 < 0.05$, this study rejects the null hypothesis and concludes that exchange rate has significant positive effect on the performance of banks in Nigeria. This finding must have been driven by the huge gains usually recorded by the banks from foreign currency operations. All the banks participate in the autonomous foreign exchange market where forex are bought and sold among the banks at profit margin; moreover, most of the banks that have international license maintain foreign branches and subsidiaries, and when the balance sheets of their foreign operations are translated to local currency, huge profits are likely to be recorded, especially with the recent volatility in the exchange rate of naira to other major convertible currencies of the world. The finding of Adiga et al. (2020), in which negative and insignificant relationship between exchange rate and banks' performance however contradicts the present finding. The contradiction must have been engendered by the use of OLS as estimation technique and measurement of banks' performance by net interest margin by Adiga et al. unlike the present study. The present finding equally disagrees with Anshu and Ghakhar (2019) who used OLS and found a significant negative relationship between exchange rate and banks performance measured by ROA.

Post-estimation Test

To be sure that the estimated coefficients are not autocorrelated and heteroscedastic, the study tested for autocorrelation and homoscedasticity of the residuals and the results are as displayed on Table 7 and 8.

Table 7. Breusch-Godfrey Serial Correlation LM Test

F-statistic	10.11475	Prob. F (2,5)	0.0675
Obs*R-squared	16.83821	Prob. Chi-Square (2)	0.0002

Source: Author's Computation (2022)

From Table 7, the p-value of the F-statistic is $0.06 > 0.05$, hence, null hypothesis cannot be rejected; the study concludes that the residuals of the estimated model are uncorrelated and therefore no biases are associated with the estimates.

Table 8. Breusch-Pagan-Godfrey Heteroskedasticity Test

F-statistic	1.179130	Prob. F (13,7)	0.4314
Obs*R-squared	14.41654	Prob. Chi-Square (13)	0.3452
Scaled explained SS	1.037802	Prob. Chi-Square (13)	1.0000

Source: Author's Computation (2022)

As in Table 7, the p-value of the F-statistics is $0.4314 > 0.05$; thus, null hypothesis that the residuals are homoscedastic cannot be rejected. The study consequently concludes that residuals of the estimated model are homoscedastic and efficiency and reliability of the estimates are robust.

5. Conclusion and Recommendations

As in the global realm, banks as finance institutions in Nigeria operate within the macro-economic environment which affects their investment and financial decisions, and by extension, their operating performances. To this end, studies have been conducted to relate different macro-economic variables to banks performance while different metrics have been used to measure performance of banks in the literature. However, within the fourth Republic of Nigeria, macro-economic variables such as GDP per capita as well as the gross domestic savings have not been examined with respect to total loans and advances granted by the banks as performance indicators. This study thus assessed the effect of macro-economic variables on banks' performance in Nigeria by considering gross domestic savings deposits, GDP per capita and other macro-economic variables in relation to total banks' loans and advances as measurement of banks' performance. With the use of both descriptive and ARDL model as techniques of analysis, the study found that all the variables examined were normally distributed and the standard deviations of the variables suggested low risk and volatility except for unemployment rate. The study further revealed that gross domestic savings and GDP per capita were positive determinants of banks' performance; a pointer to the fact that the performance of banks in terms of extension of loans and advances is predicated upon deposits availability with the banks and the level of economic prosperity experienced in Nigeria. Also, lending interest rates and unemployment rates were all revealed as negative determining factor of banks performance, with unemployment rate being

very significant. Consequently, on the strength of the results obtained, the study concludes that macroeconomic variables, especially, gross domestic savings, exchange rate and unemployment rates are significant predictors of banks performance in the fourth Republic of Nigeria. Accordingly, the following recommendations are made:

- i. The anchor rate, should be maintained at a comfortable level that would guarantee affordable lending interest rate to the investing borrowers since lending rate was found to be a significant negative determinant of banks' performance in Nigeria
- ii. It is suggested that Nigerian government should urgently enact policies that would make Nigeria an investment friendly and productivity enhancer, especially by addressing the issue of epileptic or lack of power supply, so as to increase the GDP per capita income as this has been confirmed positive in association with banks' performance by this study.
- iii. Again, creating enabling environment for investment and industries to thrive is advised as this would boost job creation and reduce unemployment rate that is negatively and significantly impacting Nigerian banks' performance according to this study.
- iv. Monetary authority should consider increasing the deposit interest rate so as to encourage more inflows of deposits into the Nigerian banks since this has positive and significant effect on banks' performance.
- v. Exchange rate should be allowed to float and determine by the demand and supply forces so as to normalize the earnings of the banks from foreign exchange operations.

Contribution to Knowledge

The literature as knowledge body has been enhanced by this study as it examined some of the macro-economic indicators, such as GDP per capital and gross domestic savings which, in relation to Nigerian banks' performance, have not been examined by the previous studies; also, the study measured Nigerian banks' performance with total of the loans and advances granted by the banks, which is different from indicators already explored the existing studies.

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