IMPACT OF NON-PERFORMING LOAN ON BANK PERFORMANCE IN NIGERIA

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ABSTRACT

Objective: Receiving a specified interest rate on term deposits and lending, which carries the risk that the borrower won't repay the debt as stipulated, are two components of the banking industry. This has to do with the likelihood that lending rates may decline, which would lead to a decrease in the bank’s investment income relative to its deposit payment income. Therefore, this study examines how Nigerian commercial banks’ financial stability is impacted by non-performing loans. The non-performing loans (NPLs), liquidity risk (LR), gearing ratio (GR), bank size (BS), and return on asset (ROA) were all utilized as proxies for non-performing loans and financial performance, respectively, using an ex-post facto research technique.

Method: The study employed a simple sampling approach to collect secondary data in accordance with the data's accessibility at the time of the investigation. These numbers were gathered from the annual financial reports of eight listed Nigerian commercial banks and cover the years 2017 through 2022. The data were analyzed using descriptive statistics and Panel Autoregressive distributed lags (PARDL) methods.

Results: The results of the analysis indicate that the model's short-run behavior exhibits a high rate of adjustment, and that it moves from the short-run to the long-run at an average speed of 48%. However, the long-term cointegration results show that the non-performing loans (-0.495623); liquidity ratio (-0.133630) and gearing ratio (-3.328567) are all statistically negatively related to return on asset. This suggests that an increase in the non-performing loans, liquidity ratio and gearing ratio tends to reduce return on asset in the long term. However, only the bank size has a positive significant relationship with return on asset.

Conclusion: The study suggests that the regulatory agencies in Nigeria increase the internal processes used by commercial Nigerian banks for risk verification, measurement, and tracking in order to foster an atmosphere where such practices can be adopted. The study recommends commercial banks to develop creative strategies to increase their inner financial ability in light of the negative association between LR and GR and performance, in order to be ready for any potential policy shift (change) in liquidity ratio and gearing ratios.

Keywords: non-performing loans, financial performance, commercial banks, Nigeria.
IMPACTO DO EMPRÉSTIMO NÃO PERFORMANCE NO DESEMPENHO DO BANCO NA NIGÉRIA

RESUMO

Objective: Receber uma taxa de juro específica sobre depósitos e empréstimos a prazo, que acarreta o risco de o mutuário não reembolsar a dívida conforme estipulado, são dois componentes do sector bancário. Isto tem a ver com a probabilidade de as taxas de empréstimo poderem descer, o que levaria a uma diminuição do rendimento do investimento do banco em relação ao seu rendimento de pagamento de depósitos. Portanto, este estudo examina como a estabilidade financeira dos bancos comerciais nigerianos é afetada pelos empréstimos inadimplentes. Os empréstimos inadimplentes (NPLs), o risco de liquidez (LR), o índice de alavancagem (GR), o tamanho do banco (BS) e o retorno sobre os ativos (ROA) foram todos utilizados como proxies para empréstimos inadimplentes e desempenho financeiro, respectivamente, usando uma técnica de pesquisa ex post facto.

Método: O estudo utilizou uma abordagem de amostragem simples para coletar dados secundários de acordo com a acessibilidade dos dados no momento da investigação. Estes números foram recolhidos a partir dos relatórios financeiros anuais de oito bancos comerciais nigerianos listados e abrangem os anos de 2017 a 2022. Os dados foram analisados utilizando estatísticas descritivas e métodos de desfasamentos distribuídos autoregressivos em painel (PARDL).

Resultados: Os resultados da análise indicam que o comportamento de curto prazo do modelo apresenta uma elevada taxa de ajustamento, e que passa do curto para o longo prazo a uma velocidade média de 48%. No entanto, os resultados da cointegração de longo prazo mostram que os empréstimos inadimplentes (-0,495623); o índice de liquidez (-0,133630) e o índice de alavancagem (-3,328567) estão todos estatisticamente relacionados negativamente com o retorno dos ativos. Isto sugere que um aumento no crédito malparado, no rácio de liquidez e no rácio de alavancagem tende a reduzir o retorno dos ativos no longo prazo. Contudo, apenas o tamanho do banco tem uma relação positiva e significativa com o retorno dos ativos.

Conclusão: O estudo sugere que as agências reguladoras na Nigéria aumentem os processos internos utilizados pelos bancos comerciais nigerianos para verificação, medição e acompanhamento de riscos, a fim de promover uma atmosfera onde tais práticas possam ser adoptadas. O estudo recomenda que os bancos comerciais desenvolvam estratégias criativas para aumentar a sua capacidade financeira interna à luz da associação negativa entre RL e GR e o desempenho, a fim de estarem prontos para qualquer potencial mudança (mudança) de política no rácio de liquidez e nos rácios de alavancagem.

Palavras-chave: empréstimos inadimplentes, desempenho financeiro, bancos comerciais, Nigéria.

IMPACTO DE LOS PRÉSTAMOS MORADOS EN EL RENDIMIENTO BANCARIO EN NIGERIA

RESUMEN

Objetivo: Recibir una tasa de interés específica sobre los depósitos a plazo y los préstamos, que conllevan el riesgo de que el prestatario no pague la deuda según lo estipulado, son dos componentes de la industria bancaria. Esto tiene que ver con la probabilidad de que las tasas de interés de los préstamos bajen, lo que llevaría a una disminución de los ingresos por...
inversiones del banco en relación con sus ingresos por pagos de depósitos. Por lo tanto, este estudio examina cómo la estabilidad financiera de los bancos comerciales nigerianos se ve afectada por los préstamos morosos. Los préstamos morosos (NPL), el riesgo de liquidez (LR), el índice de apalancamiento (GR), el tamaño del banco (BS) y el rendimiento sobre los activos (ROA) se utilizaron como indicadores de los préstamos morosos y el desempeño financiero, respectivamente. utilizando una técnica de investigación ex post facto.

**Método:** El estudio empleó un enfoque de muestreo simple para recopilar datos secundarios de acuerdo con la accesibilidad de los datos en el momento de la investigación. Estas cifras se obtuvieron de los informes financieros anuales de ocho bancos comerciales nigerianos que cotizan en bolsa y cubren los años 2017 a 2022. Los datos se analizaron utilizando estadísticas descriptivas y métodos de retardos distribuidos autorregresivos de panel (PARDL).

**Resultados:** Los resultados del análisis indican que el comportamiento de corto plazo del modelo exhibe una alta tasa de ajuste, y que pasa del corto al largo plazo a una velocidad promedio del 48%. Sin embargo, los resultados de cointegración de largo plazo muestran que la cartera vencida (-0,495623); el índice de liquidez (-0,133630) y el índice de apalancamiento (-3,328567) están estadísticamente relacionados negativamente con el rendimiento sobre los activos. Esto sugiere que un aumento en los préstamos morosos, el índice de liquidez y el índice de apalancamiento tiende a reducir el rendimiento sobre los activos en el largo plazo. Sin embargo, sólo el tamaño del banco tiene una relación significativa positiva con el rendimiento sobre los activos.

**Conclusión:** El estudio sugiere que las agencias reguladoras de Nigeria aumentan los procesos internos utilizados por los bancos comerciales nigerianos para la verificación, medición y seguimiento de riesgos con el fin de fomentar una atmósfera en la que se puedan adoptar tales prácticas. El estudio recomienda a los bancos comerciales desarrollar estrategias creativas para aumentar su capacidad financiera interna a la luz de la asociación negativa entre LR y GR y el desempeño, a fin de estar preparados para cualquier posible cambio de política (cambio) en el índice de liquidez y los índices de apalancamiento.

**Palabras clave:** préstamos morosos, desempeño financiero, bancos comerciales, Nigeria.

1 INTRODUCTION

Due to its substantial role in the current economic climate, the banking system is critical. Capital development, which is included in this, is a requirement for economic progress in a country. Through their collection of branches around the nation, they organize the modest savings of individuals dispersed across a wide area and provide it for beneficial uses. Additionally, savers are drawn to the banks because to their strength. This emphasizes how important they are because they promote and mobilize savings while also directing those resources toward profitable investment. The fact that banks accept customer deposits and lend money to borrowers for a variety of purposes is their most important function, which outweighs all others. They act as a bridge between savers and borrowers. Through the deposit lending multiplier effect, banks generate fresh funds.
when they lend. Due to this, banks have the ability to affect the level of the money supply, the distribution of funds, and the use of resources in the economy.

Additionally, banks encourage and mobilize savings while also directing that money into successful investments. The bank's most crucial role, which surpasses all others, is taking consumer deposits and lending to borrowers for a range of goals. They serve as a go-between for savers and borrowers. New funds are created as a result of lending. The long-term efficient and effective operation of the banking sector ensures the country's financial stability (Gabriel, Victor & Innocent, 2019). Banks' primary source of income is undoubtedly credit development, which sporadically exposes them to the risk of rising non-performing loan levels (NPLs) (Hou & Dickson, 2007). These NPLs, which are strongly related to financial crises, are loans whose principal and interest repayment is still owed and unpaid after 90 days or more (Bexley, Nenninger & Steve, 2012). Richard, (2011) asserted that Non-performing loans (NPLs) essentially reflect the banks' performance benchmark.

Researchers from all around the world are interested in Nigeria as a rising country and how non-performing loans relate to financial performance. The study on the correlation between non-performing loans and financial performance from the viewpoints of mentioned commercial banks in developing countries is logically justified by the fact that there is still little focus on the commercial banking industry specifically. Nigeria is a single-product economy with a high population density and a focus on inclusive and sustainable economic development. Nigeria has a difficult time ensuring the stability of the financial sector because of its tremendous overdependence on oil and scarce resources. Nigeria must therefore develop its banking sector in a safe and sustainable way. By taking care of its residents' most basic needs, this would assist the country in achieving its economic objectives. It is important to remember that the financial sector contributes significantly to the country's banking industry. Given the significance of the banking sector to the economy of Nigeria, the study's objective was to ascertain the relationship between non-performing loans and the financial performance of listed commercial banks in the country. The current study will aid in understanding how the quoted commercial banks choose their non-performing loans in a developing nation context and will serve as a guide for finance managers. Non-performing loans happen when debtors find it difficult to make payments or encounter situations that make it impossible for them to keep up with their loan repayment obligations.
To improve our understanding of non-performing loans and financial performance in various national and business contexts, a sizable number of academic research are being done. This study investigates the effect of non-performing loans on the financial performance of listed commercial banks in order to comprehend the relationship between non-performing loans and financial performance from the perspective of the mentioned commercial banks. According to earlier research, the major reasons why banks fail include rising non-performing loans (NPLs), which are caused by difficult economic factors, subpar loan management, and lack of comprehension of loan terms, among many other factors. A non-performing loan poses a significant challenge for the banking sector because it reduces bank profitability and is commonly described as preventing banks from financing more to both individuals and businesses, which in turn significantly reduces financial performance.

A crucial element of financial management is the non-performing loan, along with the liquidity ratio, gearing ratio, gearing ratio, and bank size. Researchers have attempted to investigate the relationship between non-performing loans and the financial performance of Nigerian commercial banks on various times throughout the years. However, there are differing views on how much the non-performing loans of major commercial banks harm their bottom line. For instance, some studies have demonstrated that banking concentration can affect the stability of the financial system, and there are two opposing points of view about the stability-concentration debate. The first argument claims that because there is less market competition in a highly concentrated market, banks will limit risky lending. The cost of the outsourced unit designated to track non-performing loans will increase bank operational costs, which is another effect of the rise in NPLs. Furthermore, there is a dearth of literature on non-performing loans and how they influence listed commercial banks in Nigeria, with the majority of scholars concentrating on the manufacturing sector and economic expansion. The contradictory nature of these empirical findings and the need to fill this vacuum have justified further research into this field of literature.

Therefore, the purpose of this study was to investigate how non-performing loans impacted the profitability of Nigerian commercial banks. Financial managers, lenders, and borrowers will all benefit from this research. This is because financial managers will have a better understanding of the significance of creating a concise non-performing loan that enables banks to increase earnings and maximize wealth for its owners because a
large bulk of a lender's outstanding loans can negatively impact that lender's financial results. The fact that banks primarily make money from the charge they pay on loans serves to emphasize the significance of this concept even more. They will consequently have less cash available to undertake new loans and meet operating expenses if they are unable to recoup the owed interest costs from NPLs. For both the lenders and the borrowers, the money, however, represents a possible loss of income, which has an effect on the lenders' profitability. Although it affects the lender, it also limits the options that potential borrowers have for obtaining money from the creditor. Additionally, the lender's stock price will drop if the proportion of non-performing loans rises. The quantity of non-performing loans (NPLs) a bank has diminished its appeal to investors as future profitability would suffer if the firm was unable to generate income from its credit operations. Investors will gain from knowing how non-performing loans and financial performance are related when deciding on acceptable methods to evaluate and analyze a company's financial status. This part is followed by the literature review, methods, results, and discussion of the findings, conclusion, and recommendations.

2 LITERATURE REVIEW

The conceptual review, theoretical review, and empirical examination of capital structure and financial performance are all included in this part.

2.1 CONCEPTUAL REVIEW

Between 2017 and 2022, over 10% of all loans granted in Nigeria will be NPLs; this growing trend has significantly exacerbated bank difficulties and economic instability. It was regularly seen that debtors had abandoned their debt commitments and gone to other institutions covertly to sign new debt contracts that were then likely to become non-performing loans. Bilateral status updates were useless for locating such probable multiple loan defaulters. Nowadays, it is essential to have a singular informational database from which to obtain the necessary integrated account information on debtors. This prompted the Central Bank of Nigeria to establish the Credit Risk Management System (Olusanya, Oluwatosin & Chukwuemeka, 2012). Mohd Karim and Sallahundin in 2010 claim that the administration of non-performing loans typically
comes with sizable operating costs, which have a detrimental effect on the capital growth of the affected banks. By decreasing liquidity position, distorting credit growth, and limiting real sector growth, non-performing loans (NPLs) have a significant effect on how well banks perform. According to Petersen & Rajan, (1994), NPLs also erode investors' faith in the banking system, deterring them from making rational investments. In order to restore the faith of bank customers in the Nigerian banking sector, something promptly and seriously needs to be done. In order to attract customers, banks must, among other things, inspire confidence. Return on Assets (ROA), a metric that can be used to evaluate the performance of commercial banks, shows the capacity of the bank to generate profits from the assets that are at their disposal. Athanasoglou, Brissimis & Delis, (2008), claim that ROA is used as a primary performance statistic in the majority of empirical studies. One of the most important profitability metrics in banking literature, according to the results of studies by Gabriel, Victor & Innocent, (2019) and NDIC, (2013) ROA. In order to assess the financial performance of Nigerian commercial banks, ROA will be used in this study.

The conceptual framework link between the non-performing loans and financial performance is shown in the figure below:
3 THEORETICAL REVIEW

3.1 TRANSACTIONS COSTS THEORY

The first notion put forth by Richard, (2011) will serve as the investigation's anchor. The concept suggests that when assessing a client's genuine financial situation or credit worthiness, vendors may have an advantage over conventional lenders. Suppliers are also better capable of enforcing and monitor loan repayment. All of these benefits could give suppliers a price advantage over banks. Ojo & Somoye, (2013) categorized the following three sources of cost advantage: information acquisition, buyer control, and salvaging value from existing assets. The fact that merchants can obtain client information more rapidly and affordably since it is gathered in the usual may account for the first component of cost advantage. In other words, sellers frequently visit clients more often than financial firms do, which allows them to have a greater understanding of the client's
condition. By examining the regularity and size of the buyer's orders, suppliers can also gain a better picture of the client's situation.

3.2 EMPIRICAL REVIEW

Due to the possibility of regulatory actions, the relationship between non-performing loans and productivity has become the focus of banking studies. Researchers studying bank profitability are now taking asset quality—which includes non-performing assets—into account. For the research, Kalapo (2012) employed a panel data set for five Nigerian commercial banks from 2000 to 2010. The ratio of non-performing loans was determined to be statistically significant and to have a detrimental effect on banks' profitability. In the same study, it was also pointed out that efficiency and profitability may suffer if banks are unaware of the importance of NPLs. The negative correlation between NPLs and profitability for Ghana's rural banks was statistically significant. The same study discovered that the sample banks' income would decrease by 0.05% if the number of nonperforming loans increased by 1%

Kargi, (2011) examined from 2004 to 2008 the connection between credit risk and profitability of Nigerian commercial banks and found that there was a bad connection. In Tanzania with 16 commercial banks from 2007 to 2015. The conclusion was arrived at that NPL and ROA are inversely related. The pooled OLS regressions show that each 1% increase in NPL has a negative impact on ROA. NPL has no impact on profitability or is not statistically significant, according to another set of studies. A study was conducted in Tanzania in collaboration with 11 commercial banks. The results showed that NPL has minimal impact on institutions' effectiveness or ROA. In a similar vein, another study examined how credit risk affects the profitability of 56 commercial banks in Bangladesh from 2009 to 2017. It was found that an increase in non-performing loans was not significant. The similar line of findings was reported by Do (2020), who discovered that NPL has a negligible impact on ROA and that for every 1% increase in NPL, ROA is negatively impacted by -0.05%.

A study looked into the factors that affected NPLs in the banking systems of the Euro zone between 2000 and 2008 prior to the recession. In the study's sample, 14 of the 17 nations that make up the Euro zone are included. A number of factors were taken into account, including the GDP growth rate, fiscal deficit, public debt, unemployment, loans-
to-deposits ratio, returns on assets (ROA), returns on equity (ROE), and ratio of capital adequacy. The study discovered that lending, unemployment, and inflation rate had a significantly positive link with NPLs whereas real GDP growth rate, ROA, and ROE had a negative relationship. However, the NPL ratio did not appear to be significantly impacted by the ROA, the loan-to-deposit ratio, rising prices, or the fiscal deficit. In a similar vein, Carlos (2012) found that non-performing loans (NPLs) in Spain and Italy are mostly unaffected by the inflation rate. A study examined Italy, Greece, and Spain between 2004 and 2008 to find out what factors contributed to non-performing loans for a sample of 85 banks. Both macroeconomic factors (such as the real rate of interest, unemployment, and the GDP growth rate) and bank-related parameters were adopted as variables (return on assets, loan growth and the loan loss reserves to total loans). It was discovered that the real interest rate, unemployment rate, and GDP growth rate all had a considerable favorable impact. However, the NPL ratio did not appear to be significantly impacted by ROA, loan growth, or the ratio of loan loss reserves to total loans.

Cross-sectional data and panel data methodologies were used to examine the factors that affected the growth of financial intermediaries across all of Africa from 1975 to 2006. Liquid liabilities (M3), a banking sector indicator, measures the development of financial intermediaries, and trade openness, financial openness, and GDP growth rate serve as the explanatory factors. Financial openness is determined as the amount of foreign assets and liabilities divided by GDP, and trade openness is determined as the sum of exports and imports divided by GDP. The findings of the cross-sectional regression indicated a favorable association between trade openness and the growth of financial intermediaries. The rise of financial intermediaries cannot be quantitatively explained by the GDP growth rate or financial openness. The panel regression results also indicated that financial openness has a detrimental effect on financial development and that trade openness is significant in explaining the growth of financial intermediaries. The rate of GDP growth is negligible. Using an OLS regression model, Saba et al. (2012)'s study additionally examined bank-specific and macroeconomic determinants of nonperforming loans in the US banking sector from 1985 to 2010. They regarded real GDP per capital, total loans, and lending rate as proxies of the independent variables. The results show that real total loans have a substantial positive impact, whereas interest rates and GDP per capita have a significant negative impact on non-performing loans.
In evaluating the factors that affect the effectiveness of the banking sector in Sub-Saharan Africa, a study inquires as to what else might account for the region's lack of financial development. The study's sample included 137 banks from 29 different African nations between 1998 and 2002. By using lagged independent variables as instruments, the generalized technique of moments enables the consideration of simultaneity bias reserve causality. The ratio of private loans to GDP, GDP per capita, the percentage of the population living in rural areas, capitalization, and bank size ownerships were all factors included in the cost-efficiency analysis. The factors considered for financial development were divided into five categories: financial market structure, macroeconomic conditions, geographic location and legal systems, political environment, and financial system regulation.

A study examined the explanatory variables that contributed to the development of Malaysia's banking sector, including actual earnings, interest rates, financial openness, and trade openness. The three variables of banking sector development utilized in the study were liquid liabilities (M3), private sector credit, and domestic credit. The ordinary least squares (OLS) method was used to conduct the analysis. Real income promotes the growth of the banking sector, according to the findings. Consistent GDP growth indicates that commercial enterprises meet consumer demand for products and services. Increased lending and borrowing activity will cause this cycle. The findings also illustrate that financial openness has a detrimental effect on the development of the banking sector.

Another study looked into how bank-specific factors affected NPLs in the Albanian banking system. They used the rate of interest on the entire loan, credit expansion, rate of inflation, exchange rate, and GDP growth rate as determining criteria. In order to analyze panel data gathered between 2002 and 2012, they adopted an OLS regression technique. The findings indicate a positive association between real exchange interest rates growth and a negative correlation between GDP growth rate and NPLs. The connection between interest rates and NPLs is, however, unsteady and unfavorable. Additionally, inflation has little effect on NPLs.

4 METHODOLOGY

We used an econometric analysis with monthly data time series over a five-year period to examine the effects of the NPL (2017 to 2022). This study's measures, such as
return on assets (ROA), non-performing loans ratio (NPLs), gearing ratio (GR), and bank size, are based on time series and cross-sectional data from the financial statements of eight listed commercial banks (BS). Following the availability of time series and cross-sectional data, the time period for this study has been chosen. The variable of interest in this study is NPLs, while additional control variables include liquidity ratio, gearing ratio, and bank size. Descriptive statistics, unit root, correlations, variable dynamics, and linear multivariate regression are used to examine the variables. With the exception of the banks’ size, all the variables used in the analysis are expressed as percentages of the assets’ absolute value. The fact that slight variations in the parameters are directly translated into percentage changes to an extremely precise approximation is a major benefit of this analytical form.

4.1 MODEL SPECIFICATION

This study adopted a functional model specified by Do (2020). The functional equation is expressed as follows:

\[ ROA = f (NPLs, LR, GR, BS) \]  \hspace{1cm} (1)

where:

- ROA - Return on Assets
- NPLs - Non-performing Loans
- Liquidity Ratio =
- Gearing Ratio =
- Bank Size = Log of Total Assets

The functional equation is transformed into econometric form as:

\[ ROA_{i,t} = \beta_0 + \beta_1 NPLs_{i,t} + \beta_2 LR_{i,t} + \beta_3 GR_{i,t} + \beta_3 BS_{i,t} + \mu_{i,t} \]  \hspace{1cm} (2)

where:

- \( \beta_0 \) = parametric constant or intercept,
- \( \beta_1 \), \( \beta_2 \), \( \beta_3 \) = dependent variables constant,
and $\mu$ - error term

Other independent variables in the model are typically expected to have a negative impact on bank performance as measured by return on assets, with the exception of the bank size represented by log of Assets, is believed to have a positive association with the bank performance (ROA). The equation is stated as $1 - 20$, which means that increasing the independent variables by one unit will also raise the ROA by one unit.

Variables are anticipated to have parameters similar to those in Table 1 based on prior investigations.

### Table 1

**Variables and respective parameters**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Descriptions</th>
<th>Calculations</th>
<th>Expected Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>Return on Asset</td>
<td>Net Profit / Average Asset</td>
<td>N/A</td>
</tr>
<tr>
<td>NPLs</td>
<td>Non-Performing Loans</td>
<td>Non-Performing Loan / Total Loan</td>
<td>+</td>
</tr>
<tr>
<td>LR</td>
<td>Liquidity Ratio</td>
<td>Loans / Deposits</td>
<td>-</td>
</tr>
<tr>
<td>GR</td>
<td>Gearing Ratio</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>BS</td>
<td>Log of Assets</td>
<td>Log of Assets</td>
<td>+</td>
</tr>
</tbody>
</table>

Sources: Authors Computation, (2024)

### 5 RESULTS

#### 5.1 PRE-TEST ANALYSIS

##### 5.1.1 Unit Root Test

There are some allegations that macroeconomic and financial data show a stochastic tendency that, if unregulated, can affect the statistical behavior of estimators. As a result, this research examines the stochastic aspects of the series in the model by evaluating at their order of integration using a number of unit root tests before considering the association between non-performing loans and the financial performance of Nigerian commercial banks. Table 2 demonstrates that for all variables stated in level terms, the unit root tests for non-stationarity (i.e., the Levin, Lin, and Chu t and PP-Fisher Chi-square tests) frequently reject the null hypothesis of non-stationarity at the 5% level. With a 5% level of significance, the unit root tests demonstrate that Return on Asset (ROA), Non-performing Loans (NPLs), Liquidity ratio (LR), and Bank size (BS) are stationary.
at level (that is: integrated of order zero, or I(0)), for all periods while only Gearing ratio (GR) is stationary at first difference (that is: integrated of order one, or I(1)).

### Table 2

*Showing the Unit Root Test*

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>LEVEL</th>
<th>ORDER OF INTEGRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Levin, Lin &amp; Chu t*</td>
<td>PP-Fisher Chi-square tests</td>
</tr>
<tr>
<td>ROA</td>
<td>0.0291**</td>
<td>0.0212**</td>
</tr>
<tr>
<td>NPLs</td>
<td>0.0147**</td>
<td>0.0025**</td>
</tr>
<tr>
<td>LR</td>
<td>0.0021**</td>
<td>0.0235**</td>
</tr>
<tr>
<td>GR</td>
<td>0.0230**</td>
<td>0.0061**</td>
</tr>
<tr>
<td>BS</td>
<td>0.0002**</td>
<td>0.0271**</td>
</tr>
</tbody>
</table>

The significance of double asterisk (**) in Table 2 indicates 5% level of significance. **Source:** Author’s Computation, (2024)

#### 5.2 DESCRIPTIVE STATISTICS TEST RESULTS

**Table 3**

*Descriptive Statistics*

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>ROA</th>
<th>NPLS</th>
<th>LR</th>
<th>GR</th>
<th>BS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>17.64055</td>
<td>0.126181</td>
<td>48.69750</td>
<td>3.749308</td>
<td>11.63260</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>90.02089</td>
<td>0.181393</td>
<td>20.30321</td>
<td>2.784781</td>
<td>0.576437</td>
</tr>
<tr>
<td>Skewness</td>
<td>6.077591</td>
<td>2.415493</td>
<td>0.079434</td>
<td>0.396426</td>
<td>-0.554845</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>37.96853</td>
<td>8.643196</td>
<td>3.621413</td>
<td>1.867891</td>
<td>2.527277</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>2284.244</td>
<td>91.97347</td>
<td>0.685655</td>
<td>3.183809</td>
<td>2.424799</td>
</tr>
<tr>
<td>Observations</td>
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<td>48</td>
</tr>
</tbody>
</table>

**Sources:** Authors Computation, (2024)

Table 3 provides an overview of the statistics used in this empirical inquiry. Return on Asset (ROA) has the highest mean value of 17.64055 and non-performing loans has the lowest mean value of 0.1261, while liquidity ratio (LR), gearing ratio (GR) and bank size (BS) have the mean values of 48.697, 3.749 and 11.632 respectively. Skewness is a measure of how asymmetric a distribution might be. Except for the bank size, all of the variables were positively skewed, indicating that the majority of the distribution is concentrated on the right (or left-skewed). The consequence is that skewness tends to indicate whether the distribution's mean value is greater or lower than the median. As a result, a positively skewed number implies that the mean value is greater than the median value. Kurtosis has positive values for all of the variables examined suggesting a leptokurtic distribution (too tall).
5.3 MODEL SELECTION – CRITERIA GRAPH FOR MODELS FOR ROA

Figure 2

The best 20 models, among which the overall best is automatically chosen for the estimation of the ARDL ROA Model

To clearly understand that the model that reduces the AIC is chosen given the maximum lag chosen, Figure 2 provides the values of the Akaike information criteria for the estimated ARDL model.

5.4 COINTEGRATING BOUND TESTING FOR ARDL ROA MODEL

Table 4

The Bound Test for Co Integration for ARDL ROA Model

<table>
<thead>
<tr>
<th>Test Statistics (K)</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-Statistics</td>
<td>7.879443</td>
</tr>
<tr>
<td>Critical Value Bounds</td>
<td>I(0) Bound</td>
</tr>
<tr>
<td>10%</td>
<td>2.45</td>
</tr>
<tr>
<td>5%</td>
<td>2.86</td>
</tr>
<tr>
<td>2.5%</td>
<td>3.25</td>
</tr>
<tr>
<td>1%</td>
<td>3.74</td>
</tr>
</tbody>
</table>

Sources: Authors Computation, (2024)

A limits test in Table 4 revealed the presence of long-run connections, with an F-statistic of 7.879443, which is considerably greater than the standard values for the elevation angle of test statistics at the 5% level of significance. This illustrates that there is a long-term association between return on asset, liquidity ratio, gearing ratio and bank size between 2017 and 2022. As previously stated, the research in this technique has moved to the evaluation of short and long-term situations.
Table 5

Short run Estimates for ARDL Model

<table>
<thead>
<tr>
<th>Models</th>
<th>Variables</th>
<th>Coefficient</th>
<th>Std Error</th>
<th>t-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGDP Model 1</td>
<td>CointEq(-1)</td>
<td>-0.475150</td>
<td>0.179145</td>
<td>-6.001557</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Sources: Authors Computation, (2024).

Looking at the short run co-integration error correction term in Table 5 above, the coefficient value is -0.475150, or (-48%), and the p value is less than 5%, which is significant. This indicates that the coefficient is statistically significant and negative. It also implies that the dependent and independent variables have a long-term relationship. It also implies that the model has a high rate of adjustment and that, in the event of a system disablement, it requires an average speed of 48% to transition from the short run to the long run.

Table 6

Long run Estimations for ARDL Model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>Std Error</th>
<th>t-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPLS</td>
<td>-0.495623</td>
<td>6.129694</td>
<td>-0.080856</td>
<td>0.0042</td>
</tr>
<tr>
<td>LR</td>
<td>-0.133630</td>
<td>0.833921</td>
<td>-0.160243</td>
<td>0.0007</td>
</tr>
<tr>
<td>GR</td>
<td>-3.328567</td>
<td>6.190083</td>
<td>-0.537726</td>
<td>0.0004</td>
</tr>
<tr>
<td>BZ</td>
<td>2.413863</td>
<td>2.404628</td>
<td>1.003841</td>
<td>0.0003</td>
</tr>
<tr>
<td>C</td>
<td>3.212745</td>
<td>1.192422</td>
<td>2.694302</td>
<td>0.0016</td>
</tr>
</tbody>
</table>

Sources: Authors Computation, (2024).

The long-term cointegration results show that non-performing loans (-0.495623); liquidity ratio (-0.133630) and gearing ratio (-3.328567) are all statistically negatively related to return on asset. This suggests that an increase in the non-performing loans, liquidity ratio and gearing ratio tends to reduce return on asset in the long term. However, only the bank size has a positive and statistically significant relationship with return on asset.
6 CONCLUSION AND RECOMMENDATIONS

The study examined the financial effects of non-performing loans on Nigerian commercial banks between 2017 and 2022. The annual reports and other publications of the Nigerian Commercial banks that are publicly traded were used to collect secondary time series and cross-sectional data. The dependent variable, commercial bank financial performance, was represented by ROA, and the independent variable, non-performing loans, represented by LR, GR, and BS (the independent variables). The impact of the variables was examined using a panel autoregressive distributed lag technique. The diagnostic test was run to determine the degree of multicollinearity, and unit root test was subsequently run. The co-integration test demonstrates that the variables do not co-integrate. The Return on Asset (ROA), Non-performing Loans (NPLs), Liquidity Ratio (LR), and Bank Size (BS) are stationary at level (that is, integrated of order zero, or I(0)), for all periods, according to the unit root tests from Levin, Lin, and Chu t and PP-Fisher Chi-square tests, but only the Gearing Ratio (GR) is stationary at first difference (that is, integrated of order one, or I(1)) (1). According to the long-term cointegration data, return

Tables 7

Residual Diagnostics Tests and Stability Diagnostics Tests Result

<table>
<thead>
<tr>
<th>Residual Diagnostics Tests Result</th>
<th>F-statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breusch-Godfrey Serial Correlation LM Test:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heteroskedasticity Test</td>
<td>0.344577</td>
<td>0.8820</td>
</tr>
<tr>
<td><strong>Stability Diagnostic Test Result</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tests</td>
<td>F-statistic Values</td>
<td>Probability</td>
</tr>
<tr>
<td>ROA Model</td>
<td>1.346840</td>
<td>0.2544</td>
</tr>
</tbody>
</table>

Sources: Authors Computation, (2024)

From the table, the Breusch-Godfrey Serial Correlation LM test for the model uncovers that there is no nearness of sequential connection making a decision from the F-Statistics and the likelihood esteems which are more prominent than 0.05. Additionally, the heteroskedasticity test for the model uncovers that there is no heteroscedasticity issue making a decision from the F-Statistics and the likelihood esteems which are more prominent than 0.05. In any case, the dependability test result utilizing Ramsey RESET test demonstrates that the model were entirely steady considering the likelihood esteem that were more prominent than 5%. 
on assets is statistically negatively correlated with non-performing loans (-0.495623), liquidity ratio (-0.133630), and gearing ratio (-3.328567). This suggests that an increase in the non-performing loans, liquidity ratio and gearing ratio tends to reduce return on asset in the long term. However, only the bank size has a positive and statistically significant relationship with return on asset. The regulatory body in Nigeria should foster and encourage a climate where commercial banking institutions can have stringent risk management practices by enhancing the bank's internal risk management framework of identifying risks, evaluation, and controlling. This recommendation was developed in response to the study's findings. The study recommends commercial banks to develop creative strategies to increase their intrinsic financial capability in light of the negative association between LR, GR and performance, in order to be ready for any potential policy shifts in liquidity ratio and gearing ratios.
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