Moderating Role of Inflation on How Loan and Debt Ratios Influence Profitability: A Study of Deposit Money Banks Quoted on Nigerian Exchange

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Abstract

This study aims to evaluate how non-performing loans, short term debt to total asset, debt to equity and loans to deposits ratios affect return on assets of deposit money banks quoted on the Nigerian Exchange. Furthermore, the study looks at how inflation moderates the relationship between these ratios and profitability. A sample size of eight (8) deposit money banks is selected for this study, while maintaining a ten (10) year scope of 2012 to 2021. Robust standard errors random-effects regression is used to test the hypotheses. The results are that non-performing loans ratio significantly and negatively affect return on assets (t-value = -6.05; p-value = 0.000); short term debt to total assets ratio negatively and insignificantly affect return on assets (t-value = -1.94; p-value = 0.052); debt to equity ratio significantly negatively affects return on assets (t-value = -9.33; p-value = 0.000); and loan to deposit ratio negatively and insignificantly affects return on assets *(t value = -1.21; p-value = 0.226). Meanwhile, it is established that inflation has a positive insignificant effect on return on assets (t-value =1.77; p-value = 0.077). Inflation also moderates the relationship between the following ratios and return on assets: non-performing loan ratio (t-value = 3.93; p-value = 0.000), short term debt to total asset ratio (t-value= -4.06; p-value = 0.000) and debt to equity ratio (t-value = 2.13; p-value =0.033). Lastly, inflation does not moderate the relationship between loans to deposit ratio and return on assets (t-value = 1.45; p-value = 0.148). The policy implication of these for deposit money banks is that loan and debt ratios can influence profit differently during periods of high inflation.*

Keyword*s: Inflation; return on assets; non-performing loans; short term debt; debt to equity; loans to deposit.*

1.1 Introduction

Apart from firm specific ratios that could affect financial performance, there are also external, macro-economic situations that affect financial performance. In the financial services sector for example, interest rates, unemployment, inflation, exchange rates as well as other monetary policy metrics have been known to drive financial performance (Henbest, 2006). In support of this, the Central Bank of

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Nigeria in 2019 published a stress test guideline for financial institutions. The regulatory body has directed financial institutions to carry out quarterly tests to review the effect of external factors, certain risks and liquidity on financial performance (CBN, 2019). Along this line, international credit rating agencies have predicted that it would be difficult for Nigerian banks to maintain their high returns, due to high credit costs as well as macro-economic factors like inflation (Fitch. 2022). The major contribution that this study would make to existing knowledge is by filling the research gap that was created by the lack of studies on how inflation reflects on how key metrics drive profit. Also, it will contribute to existing knowledge by using a smaller sample size that had not been considered in recent studies.

The main aim of this study is to determine the role of inflation on the relationship between loan and debt ratios, and return on assets of deposit money banks quoted on the Nigerian Exchange. The objectives are to determine if non-performing loans ratio, short term debt to total assets ratio, debt to equity ratio and loans to deposits ratio have significant effects on return on assets of deposit money banks quoted on the Nigerian Exchange. While the rest of the objectives are to evaluate whether inflation moderates the relationships between the following: non-performing loans ratio and return on assets; Short term debt to total assets ratio and return on assets; debt to equity ratio and return on assets, and lastly, loans to deposits ratio and return on assets.

In view of the research problem and research objectives, the hypotheses of the study are presented as follows:

Ho$_1$ *Non-performing loans ratio has no significant effect on return on assets of deposit money banks quoted on the Nigerian Exchange.*
Ho$_2$ *Short term debt to total assets ratio has no significant effect on return on assets of deposit money banks quoted on the Nigerian Exchange.*
Ho$_3$ *Debt to equity ratio has no significant effect on return on assets of deposit money banks quoted on the Nigerian Exchange.*
Ho$_4$ *Loans to deposit ratio has no significant effect on return on assets of deposit money banks quoted on the Nigerian Exchange.*
Ho$_5$ *Inflation has no moderating effect on the relationship between non-performing loans ratio and return on assets of deposit money banks quoted on the Nigerian Exchange.*
Ho$_6$ *Inflation has no moderating effect on the relationship between short-term debt to total assets ratio and return on assets ratio of deposit money banks quoted on the Nigerian Exchange.*

Ho$_7$ *Inflation has no moderating effect on the relationship between debt to equity ratio and return on assets of deposit money banks quoted on the Nigerian Exchange.*

Ho$_8$ *Inflation has no moderating effect on the relationship between loans to deposits ratio and return on assets of deposit money banks quoted on the Nigerian Exchange.*

This study covers a time period of 2012 to 2021, which is 10 years and this was chosen because of easier access to data with respect to the sampled firms, as well as the cut off period that relates to the adoption of IFRS across the Nigerian corporate reporting ecosystem. Also, the total sample for the study is 8 deposit money banks that are quoted on Nigerian Exchange. Initially, this total number was 12 banks; however, 4 companies had to be excluded from the sample because they were now classified as holding companies. Eventually, the final sample was benchmarked against the fulfillment of the specific requirements.

This paper is divided into five sections. Part one provides a general background and overview of the research topic. Part two presents conceptual, empirical and theoretical reviews, while part three evaluates and attempts to justify the methodology of the study. Part four shows the results of the quantitative analysis and explains the implications of these results. Lastly, part five consists of conclusion and recommendations based on the findings from the study.

2.1 Conceptual Review of Contemporary Thoughts on Loan and Debt Ratios, Profitability and Inflation.

The return on assets is described as a ratio that shows how a company is using its assets to generate sales and profit. The components of this ratio include the return and assets, which serve as the numerator and denominator respectively. Generally, companies aim to achieve a high return on assets as possible, because this means that they are able to use fewer resources more efficiently. It is important to note that this ratio should be compared to companies within the same sector, because various companies are known to have different asset classes which have different uses (Hayes, 2022; Hargrave, 2022).

Loan is said to be non-performing when it goes into default, because of non-repayment over an agreed amount of time and it is a general consensus that when

the default in terms of repayment goes beyond a 90 day period, it can be established to be a non-performing loan (Segal, 2022). The major cause of non-performing loans is when the debtor is faced with economic hardship. For example, a job loss or drastic change in an economic policy, may lead to adverse effects which will make the debtor go into default. Consequently, the Central Bank of Nigeria (CBN) had in recent times, mandated deposit money banks to limit their non-performing loans ratio to 5% of total customer loans (Nairametrics, 2020). However, over this period, some deposit money banks have had ratios that went below or blew over this prudential threshold. From the foregoing therefore, the non-performing loan ratio can be used as a reliable metric for measuring credit risk for deposit money banks (Brock, 2022).

When it comes to short term leverage, there are synonyms that can be applied. Another name for short term debt is current liability, and the common factor here is that these are all obligations that need to be settled within a twelve (12) month period (Ganti, 2020). One advantage of this form of finance is that it can be used as an emergency source of buffer, especially when longer term finance is not readily available. However, when it comes to this form of finance, there is significant uncertainty due to how difficult it is to predict how long such amounts can remain uncalled. Generally, this is a convenient method of finance when compared to the use of long term debt or the mobilization of equity finance.

Fernando (2022) defines the debt to equity ratio as the proportion of total debt to the total amount of shareholders' capital. Also, when the debt to equity ratio of a company is higher than that of its competitors, its shares are usually regarded as riskier. Another con of debt financing is that the creditor would be required to make payments regardless of if there is a profit or a loss. In addition to these, variable financing terms could change dramatically (Cremades, 2018). However, an advantage of debt finance is that responsibility to the creditor ends when all of the repayment terms have been completed. Also, the interest payments are tax deductible and the cost do not fluctuate as much as equity share price. What this means is that it is easy to forecast expenses when debt finance is selected (Maverick, 2022).

The loan to deposit ratio is a metric that deposit money banks use to measure liquidity (Murphy, 2020). The disadvantage of this ratio increasing is that liquidity may not be sufficient to cover operational needs. And when this ratio goes below the required threshold, it means that the earnings of the bank are reducing. There is indeed a dilemma with regards to sustaining a balance between the loans and deposits. On one hand, liquidity is important to meet operational responsibilities

and unforeseen events and on the other hand, interest on loans are the largest contributor to profitability. Therefore, management needs to work together with regulatory bodies so that the policies that are formulated on their behalf are in the best interests of their diverse group of stakeholders. It is important to note that the Central Bank of Nigeria has prescribed a minimum loan to deposit threshold of 65% for deposit money banks (CBN, 2021).

Inflation is defined as a remarkable escalation of how much goods and services are sold in a way that the value of money that is owned at a particular time is eroded and is less of its value at a later date (Fernando, 2022). Furthermore, there are various views that relate to the significance of inflation on business operations. One school of thought is that inflation can be a good thing for businesses and the economy at large. For example, during inflation, people are willing to pay more for certain fixed assets. This translates to the increase in value for those who already possess these assets. Also, when a business has a fixed rate on debts, the borrower's cost of borrowing reduces when inflation exceeds this fixed rate. In addition, in some stock markets, stocks are known to benefit from inflation (Tretina, 2022).

2.2 Empirical Review

Ismael (2022) in his study on Islamic banks found that inflation increased the financial performance and this was ascribed to the use of inflation adjusted pricing, which shielded the companies from the negative effects of inflation. Likewise, Fathi *et al*., (2022) showed that inflation increased the financial performance of the studied firms. In another study that was carried out on sampled Jordanian banks from the Amman Stock Exchange, Alzoubi (2021) showed that financial performance for the sampled companies improved from 2015 to 2018 despite the effect of some of the macroeconomic variables. Additionally, inflation was linked with higher domestic national debt (Mei & Zhiyong, 2021). However, Zein & Ångström (2016) showed that inflation had a negative relationship with debt among Swedish firms. Again, for Jan & Rafiq (2011) in their study on a sample of companies from Pakistan, their findings showed a negative link between inflation and debt to equity ratio.

Among various geographical locations it has been determined that non-performing loan ratios have a negative and significant effect on return on assets (Nugraha *et al*., 2021; Pham & Nguyen 2020; Akter & Roy, 2017). When it comes to how inflation interacts with non-performing loans, a few studies established that

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inflation increases the likelihood of non-performing loans becoming worse (Bukhard, 2022; Tham *et al.*, 2021), while some studies showed that inflation and non-performing loans were negatively associated (Ptasica, 2019; Mazreku, *et al.*, 2018). Additionally, some of the studies that showed that non-performing loans and profitability were negatively linked also showed that unemployment and non-performing loans were positively correlated.

Among the findings of Ochenge (2022) was that diversification of finance from short term sources was able to increase profitability of sampled Kenyan firms. In support of this, Harisa *et al.*, (2019) and Musah, (2018) were able to discover that increasing leverage had a significant effect on the financial performance of the sampled financial institutions. Along the same line and according to various researchers, whenever there was uncertainty with regards to monetary policies that relate to inflation, bank leverage ratios were shown to increase (Fu & Luo, 2021; Ahamed, 2021; Istiak & Serletis, 2020). Nurita (2022) showed that debt to equity ratio had a positive and significant effect on return on assets. However, Irman & Purwati (2020)**,** in their study on Indonesian banks, established that return on assets reduced insignificantly when equity ratio increased

The studies on the effect of loans to deposits have shown that loans to deposits ratios have a positive and insignificant impact on profits (Suroso, 2022; Digdowiseiso, 2021). For the inflation-deposit nexus, it was determined that inflation had a negative and significant effect on deposit mobilization (Azolibe, 2019; Orok *et al.*, 2018). In contrast, it was shown by Naz *et al.* (2018) and Putri & Purnama (2021) that inflation was positively but insignificantly connected to deposit mobilization.

2.3 Theoretical Review

This paper anchors the aim, firstly on the Modigliani-Miller Theorem, which asserts that returns do not rely on financing structure. This theory is tied to the objectives that relate to short term debt to total assets ratio, non-performing loan ratio, debt to equity ratio as well as loans to deposit ratio. In other words, it is expected that under perfectly efficient markets, the financial performance of deposit money banks would not be linked to how it finances its operations (Modigliani & Miller, 1958). The other relevant theories for this study are the time value of money theory which emphasizes that debt is beneficial for financial returns in periods of high inflation (Lusk, 2022). The last relevant theory for this study is the Phillips Curve theory which provides an explanation for why loans begin to re-perform when inflation increases (Hoover, 2022).

2.4 Gap in Literature

It can be observed that a large part of studies that have been performed were in countries other than Nigeria. Again, there were few studies that explored short term debt to total assets ratio as a metric that could be used to measure leverage. Furthermore, there is a lack of studies that attempted to look into how inflation influenced the relationship between various loan and debt risks, and profitability. In addition, for the years 2012 to 2021, there were almost no empirical material that made use of the eight (8) deposit money banks that are currently quoted on the Nigerian Exchange. Before this time period, the number of deposit money banks exceeded this amount. As some of the deposit money banks have now been restructured into holding companies, a new sample would be needed to fill the research gap.

3.1 Methodology

This study absorbed a sample from a population of the CBN approved list of 31 deposit money banks as at June 2021. Thereafter, a sample size of 8 companies was chosen through purposive sampling. Because these companies belong to the same group and the sample size is relatively small, the use of purposive sampling is justified (Battaglia, 2008). The criteria that was set for this selection was that the banks had to have a complete set of audited annual reports from 2012 to 2021 and they must be quoted on the Nigerian Exchange throughout this period. In view of this, 8 firms were used. Data originated from year-end audited financial reports of the firms and inflation data was extracted from CBN's annual statistical bulletin. These data are discrete and continuous in nature because they exist as whole numbers as well as decimals after computation. After the financial ratios were computed with Microsoft Excel, the data was pasted into Stata 13$^{©}$ and quantitative analysis was performed after linear regression assumption tests were carried out.

3.2 Model Specification

Panel data econometric model is used in this study, because it is known to control for heterogeneity that can happen as a result of diversity in financial accounting information that is extracted from companies that have different characteristics (Torres-Reyna, 2007). This model, as adapted from Salihu and Muhammed (2022) is as follows:

$$ROA_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 STDTA_{it} + \beta_3 DE_{it} + \beta_4 LTDR_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots(1)$$

From the model above, $_i$ is the number of individual companies; $_t$ is the time period from 2012-2021; α is the intercept; β_1 to β_4 stands for coefficient of independent model; ε represents error term. Furthermore, ROA represents return on assets; NPL stands for non-performing loan ratio; STDTA is the Short term debt to total assets ratio; DE stands for debt to equity ratio, and LTDR represents loans to deposits ratio.

$$ROA_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 STDTA_{it} + \beta_3 DE_{it} + \beta_4 LTDR_{it} + \beta_4 AVINF_{it} + \beta_5 AVINF*NPL_{it} + \beta_6 AVINF*STDTA_{it} + \beta_7 AVINF*DE_{it} + \beta_8 AVINF*LTDR_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots(2)$$

Where AVINF is average year-on-year inflation rate and β_1 to β_8 are the coefficients of the model.

3.3 Variables and their Measurements

Table 1: Variable Measurement

Variables	Type	Measurement and Justification
Return on Assets (ROA)	Dependent	Measured as profit before interest and tax divided by average total assets (Salihu & Adediran, 2021)
Non-performing Loans (NPL)	Independent	Measured as total customer loans that have not been paid for more than 90 days, divided by total customer loans granted (Nwosu, *et al*., 2020).
Short Term Debt to Total Assets (STDTA)	Independent	Measured as total non-current liabilities divided by total assets (Salim, & Yadav 2012)
Loan to Deposit Ratio (LTDR)	Independent	Measured as total customer loans divided by total customer deposits (Hunjra *et al*., 2020)
Debt to Equity Ratio (DE)	Independent	Measured as the total liability divided by total equity (Bunea *et.al*., 2019)
Average Inflation (AVINF)	Moderating Variable	Measured as Nigeria's average year-on-year inflation (Ishfaq & Khan, 2015)

Source: Researchers' compilation (2022)

4.1 Data Analysis

Table 2: Descriptive Statistics

VARIABLES	OBS	MEAN	STD.DEV	MIN	MAX
ROA	80	1.144875	1.714636	-9.53	4.7
NPL	80	4.705	6.155464	0	33.58
STDTA	80	68.00538	16.29026	31.13	161.21
DE	80	9.09725	20.75963	-2.98	190.21
LTDR	80	66.045	21.78115	3.55	138
AVINF	80	12.366	3.115791	8.05	16.95

Source: Researchers' computation (2022) with Stata 13.0$^{©}$

Table 2 shows that for return on assets (ROA) the standard deviation is 1.714636 and higher than the mean, indicating that there was a relatively fast growth of return on assets for the companies during the period. With regards to the non-performing ratio (NPL), the mean is 4.705 which is below the most recent CBN benchmark. When it comes to the short term debt ratio (STDTA) the mean is 68.00538, while the standard deviation is 16.29026. This is an indication that on aggregate, the 8 quoted deposit money banks for the period 2012 to 2021 have seen a slowdown of their reliance on short term finance as a percentage of total assets.

With respect to the debt to equity ratio (DE), the minimum value is -2.98, which belongs to Unity Bank Nigeria Plc., a deposit money bank that has been challenged by negative equity for a couple of years. When it comes to loan to deposit ratio (LTDR), there appears to be a more aggressive growth of deposits as well as deposit mobilization efforts due to the value of the standard deviation of 21.78115, exceeding the mean value of 66.045. Finally, it can also be observed that the standard deviation for average year-on-year inflation (AVINF) is 3.115791, which is lower than the mean value of 12.266. What this means is that average year-on-year inflation for the period did not experience a fast growth as expected.

4.2 Correlation Matrix

Table 3: Correlation Matrix

	ROA	NPL	STDTA	DE	LTDR	AVINF
ROA	1.0000					
NPL	-0.2159	1.0000				
STDTA	-0.4445	-0.2239	1.0000			
DE	-0.2008	0.1594	0.0278	1.0000		
LTDR	0.1912	0.1637	-0.6627	-0.1200	1.0000	
AVINF	-0.1181	-0.0531	-0.0488	0.0004	0.1441	1.0000

Source: Researchers' computation (2022) with Stata 13.0$^{©}$

The correlation matrix shown in table 3 shows that ROA is weakly negatively correlated with non-performing loan by 21.59%. This means there is an inverse relationship between the two variables. ROA is moderately negatively correlated with short term loan by 44.45%. In other words, this means when short term loan increases, ROA decreases. Debt to equity ratio has very weak negative correlation with ROA to the sum of 20%, and loan to deposit ratio has a very weak but positive correlation with ROA by 19%, indicating a positive relationship with the dependent variable. Also, Average inflation has a very weak negative correlation with ROA by 11%. It can be established that there is no presence of multicollinearity within the independent variables as all the values lie below 80% (Gujarati, 2022).

After the correlation analysis, it is important to determine the inferential nature of the panel data model. Therefore, and in consideration of the heteroskedastic nature of the variance of the residuals, robust standard errors, random-effects GLS regression is employed.

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4.3 Hierarchical Multiple Regression Results
Table 4: Robust Standard Errors Random-Effects GLS Regression

	MODEL 1		MODEL 2	
	Z	P-VALUE	Z	P-VALUE
NPL	-6.05	0.000	-5.79	0.000
STDTA	-1.94	0.052	3.84	0.000
DE	-9.33	0.000	-2.17	0.030
LTDR	-1.21	0.226	1.27	0.203
AVINF			1.77	0.077
AVINF*NPL			3.93	0.000
AVINF*STDTA			-4.06	0.000
AVINF*DE			2.13	0.033
AVINF*LTDR			-1.45	0.148
-CONS	2.32	0.020	-1.47	0.143
N	8		8	
OBS	80		80	
R-SQUARE	0.3295		0.6516	
WALD-CHI2(4)	663.82			
PROB>CHI2	0.0000			

Dependent variable: ROA
Source: Researchers' computation (2022) with Stata 13.0$^{©}$

This study has complied with several criteria for applying a moderator to a model. Firstly, by establishing through empirical justification, that there is a link between the moderator variable and the dependent variable and that there is also a relationship between the moderator variable and the individual independent variables. Another criterion for moderation is that the second step which displays the moderation must show a significant increase in the R^2. Thirdly, the effect of this moderation must be significant (Baron & Kenny, 1986; Aiken *et al*, 1991). Consequent to the application of the test for heteroskedasticity and Hausman test, table 6 shows the robust standard error, random-effects GLS regression of the two (2) models of the study.

Starting with model 1, non-performing loans ratio (NPL) has a negative significant effect on the return on assets (t-value = -6.05; p-value = 0.000). Additionally, for every unit increase in non-performing loans ratio, return on assets will decrease by -.0530602. Also, short term debt to total assets ratio (STDTA) has a negative insignificant effect on return on assets of deposit money banks (t-value = -1.94; p-value = 0.052). Furthermore, for every unit increase in short term debt to total asset

ratio, return on assets will decrease by -0.720389. The regression results also show that debt to equity ratio (DE) has a negative significant effect on return on assets of deposit money banks (t-value = -9.33; p-value = 0.000). In addition, for every unit of increase in debt to equity ratio, return on assets decreases by -0.0146964. Along the same line, loans to deposit ratio (LTDR) has a negative insignificant effect on return on assets of deposit money banks (t value = -1.21; p-value = 0.226). Along the same line, it can be determined that a unit increase in loans to deposit ratio decreases return on assets by -0.0172382.

Model 2 in table 6 shows that inflation (AVINF) has a positive insignificant effect on return on assets (t-value =1.77; p-value = 0.077. There is also an implication that when a unit of average year on year inflation increases, return on assets also increases by 1.111429. Also, inflation positively moderated the relationship between non-performing loans ratio and return on assets (t-value = 3.93; p-value = 0.000). Moreover, Inflation negatively moderated the relationship between short term debt ratio and return on assets (t-value= -4.06; p-value = 0.000). The relationship between debt to equity ratio was positively moderated by inflation (t-value = 2.13; p-value =0.033), and lastly, inflation did not moderate the relationship between loans to deposit ratio and return to assets (t-value = 1.45; p-value = 0.148).

4.4 Test of Hypotheses

Ho₁ *Non-performing loans ratio has no significant effect on return on assets of deposit money banks quoted on the Nigerian Exchange.*

The GLS regression for model 1 shows that non-performing loans ratio (NPL) has a negative significant effect on the return on assets of deposit money banks quoted on the Nigerian Exchange. Consequently, this study rejects the null hypothesis that states that non-performing loans ratio has no significant effect on return on assets.

Ho₂ *Short term debt to total assets ratio has no significant effect on return on assets of deposit money banks quoted on the Nigerian Exchange.*

The GLS regression for model 1 shows that short term debt to total assets ratio has a negative insignificant effect on return on assets of deposit money banks quoted on the Nigerian Exchange. Therefore, this study fails to reject the null hypothesis that states that short term debt to total asset ratio has no significant effect on return on assets.

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Ho₃ *Debt to equity ratio has no significant effect on return on assets of deposit money banks quoted on the Nigerian Exchange.*

The GLS regression for model 1 shows that debt to equity ratio has a negative significant effect on return on assets of deposit money banks quoted on the Nigerian Exchange. In view of this, this study rejects the null hypothesis that debt to equity ratio has no significant effect on return on assets.

Ho₄ *Loans to deposit ratio has no significant effect on return on assets of deposit money banks quoted on the Nigerian Exchange.*

The GLS regression for model 1 shows that loans to deposit ratio has a negative insignificant effect on return on assets of deposit money banks quoted on the Nigerian Exchange. Therefore, this study fails to reject the null hypothesis that loans to deposit ratio has no significant effect on return on assets of deposit money banks listed on the Nigerian Exchange.

Ho₅ *Inflation has no moderating effect on the relationship between non-performing loans ratio and return on assets of deposit money banks quoted on the Nigerian Exchange.*

The GLS regression for model 2 shows that inflation with high non-performing loans ratio have significant positive effects on return on assets of deposit money banks quoted on the Nigerian Exchange. Consequently, this study rejects the null hypothesis that inflation has no moderating effect on the relationship between non-performing loans ratio and return on assets.

Ho₆ *Inflation has no moderating effect on the relationship between short-term debt to total assets ratio and return on assets ratio of deposit money banks quoted on the Nigerian Exchange.*

The GLS regression for model 2 shows that inflation with short term debt to total asset ratio have significant negative effects on return on assets of deposit money banks quoted on the Nigerian Exchange. In consideration of these, this study rejects the null hypothesis that average year-on-year inflation has no moderating effect on the relationship between short term debt to total asset ratio and return on assets of deposit money banks quoted on the Nigerian Exchange.

Ho₇ *Inflation has no moderating effect on the relationship between debt to equity ratio and return on assets of deposit money banks quoted on the Nigerian Exchange.*

The GLS regression for model 2 shows that inflation with debt to equity ratio have significant positive effects on return on assets of deposit money banks quoted on the Nigerian Exchange. In consideration of these, this study rejects the null hypothesis that average year-on-year inflation has no moderating effect on the relationship between debt to equity ratio and return on assets of deposit money banks quoted on the Nigerian Exchange.

Ho₈ *Inflation has no moderating effect on the relationship between loans to deposit ratio and return on assets of deposit money banks quoted on the Nigerian Exchange.*

The GLS regression for model 2 shows that inflation and loans to deposit ratio increase, return on assets will decrease. Therefore, this study fails to reject the null hypothesis that average year-on-year inflation has no moderating effect on the relationship between loans to deposit ratio and return on assets.

4.5 Discussion of Findings

From the literature review and statistical analysis that were performed, in terms of non-performing loans ratio, it was determined that it has a significant negative effect on return of assets of deposit money banks quoted on the Nigerian Exchange. This result is in line with previous studies (Nugraha *et al*., 2021; Pham & Nguyen, 2021; Akter & Roy, 2017). However, it defies the premise behind the Modigliani-Miller Theory.

In addition, previous studies such as those done by Musah, (2018) and Harisa *et al*., (2019) support the results from this study which confirm that short term debt to total asset ratio has a negative insignificant effect of return on assets of deposit money banks quoted on the Nigerian Exchange. This however is not line with the time value of money which stipulates that higher debt could lead to higher returns.

With regards to the effect of debt equity ratio on return on assets, the outcome of analysis done was not in line with previous studies (Irman & Purwati, 2020; Nurita, 2022). Again, the result was not in alignment with the Modigliani-Miller Theory. In other words, it can be established that when it comes to deposit money banks quoted on the Nigerian Exchange, higher debt will not translate to higher profits.

This paper also sought to investigate if loans to deposits ratio has any significant effect on the return on assets of deposit money banks quoted on the Nigerian

Exchange. Consequently, the results from the test of hypothesis showed that loans to deposit ratio has a negative insignificant effect on return on assets. This is not in line with previous studies like Suroso (2022); Digdowiseiso (2021) and is also not consistent with the Modigliani-Miller Theory.

Additionally, this study showed that inflation moderates the relationship between non-performing loans ratio and return of assets. In essence, it holds that when inflation increases, it completely reverses the negative effect that non-performing loans have on financial performance. This is in agreement with previous studies like Mazkreku *et al*., (2018), who rationalized this by stating that employment was positively correlated to non-performing loans. It was also in line with the study carried out by Ptasica (2019). Again, this supports the Phillips Curve theory which explained that when there is high inflation as well as an economic boom, creditors would find it easier to fulfil their credit terms.

Along the same line, this study showed that when there was high inflation, companies that relied on short term debt as a percentage of total assets performed worse. This goes along with previous studies (Evers *et al*., 2020; Fu & Luo, 2021; Istiak & Serletis, 2020). Again, the results do not hold true for the time value of money theory. What this translates to is that, inflation did not offset the negative effect of short term debt had on return on assets.

With regards to the role of inflation on how debt interacts with financial performance, this study showed that inflation completely reverses the negative effect that debt had on profitability in deposit money banks quoted on the Nigerian Exchange. This means results from previous studies (Jan & Rafiq, 2011; Zein & Angstrom, 2016) can be relied on. However, this does not agree with Mei & Zhiyong (2021). Overall, this strongly supports the premise behind the time value of money theory which states that borrowers usually benefit from inflation, than lenders.

The results for the final hypothesis showed that inflation slightly worsened the relationship between a high loan to deposit ratio and financial performance. In other words, when inflation increased, a high loan to deposit ratio presented even lower profits than when there was no inflation. This result does not support the results from other studies (Putri & Purnama, 2021; Naz *et al*., 2018). Again, with regards to the Modigliani-Miller theorem, this goes further to show that when it comes to liquidity risk, the mix of loans to deposit would not likely take away from the profits of deposit money banks, when there is a period of higher inflation.

5.1 Conclusion and Recommendations

The overall aim of this study was to evaluate the effect of debt and loan ratios on the return of assets of deposit money banks listed on the Nigerian Exchange. Consequently, two (2) models were specified to test the objectives of the study. After basic assumption testing was conducted, regression results showed that non-performing loans ratio had a significant negative effect on return on assets; short term debt ratio had an insignificant effect on return on assets, debt to equity ratio had a significant negative effect on return on assets, loans to deposits ratio had an insignificant negative effect on return on assets; inflation positively moderates the relationship between non-performing loans and debt to equity ratios and return on assets. Also, inflation negatively moderates the relationship between short term debt ratio and return on assets, but inflation did not successfully moderate the relationship between loans to deposit ratio and return on assets. The study therefore recommends the following:

1. Because the results show that in the absence of inflation, non-performing loans significantly reduce profits, this study recommends that CBN find more innovative ways to penalize banks that do not comply NPL limits. A good deterrence measure would be to set a more prudent limit for directors who take loans from the banks they manage.

2. As the analysis shows that over-reliance on short term debt negatively affects profits, banking sector regulators should consider setting a benchmark for banks on how much short term finance they can use to run their operations.

3. Management of the sampled banks switch on to equity for their financial needs, instead of debt when the rate of inflation is not increasing significantly. This is because the analyses show that a higher debt to equity ratio significantly reduces profits.

4. The results also show that loan to deposit ratio insignificantly negatively affects return on assets. Thus it is recommended that management find innovative ways to prioritize customer deposits over loans to customers.

5. From the results of the regression, higher non-performing loans significantly increase profits during a period of high inflation. Therefore, during periods of increasing inflation and economic boom, it is recommended that the CBN give more room for deposit money banks to increase their non-performing loan threshold to a less prudential percentage. This would serve as an incentive for management to relax credit terms, lend more money and earn more interest income from customers.
6. Management and finance directors of deposit money banks need to limit their reliance on short term finance during periods of high inflation, as going for this method of finance would negatively impact the financial performance of the deposit money banks.
7. With regards to debt, it is almost universal knowledge that borrowers are known to benefit more during periods of high inflation. In weighing the options between taking on more debt or equity, management of deposit money banks should select the debt route. This is beneficial especially when the owners of the companies are concerned about equity costs like dilution of earnings and voting rights.

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