Non-Interest Income and Deposit Money Banks (DMBs)
Performance in Nigeria

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Abstract
The review of the regulations guiding the activities of Deposit Money Banks (DMBs) in Nigeria affected the revenue generated by DMBs, forcing most banks to diversify their sources of revenue to non-interest income. Panel data technique was employed to examine the impact of non-interest income on DMBs performance in Nigeria from 2012 through 2019. The empirical finding revealed that non-interest income, capital adequacy ratio, and bank loan positively and significantly impact DMBs performance. The study recommends that DMBs delve into non-interest income activities as it appeared to improve the performance of DMBs in Nigeria, and the monetary authority should review the policy guiding the non-interest income activities of the DMBs at regular intervals.

Keywords: non-interest income, Return on Asset, Panel regression, Bank Performance

How to Cite:
INTRODUCTION

Deposit Money Banks (DMBs) are mainly expected to accept deposits from the surplus unit and make it available as credit to the deficit unit, known as financial intermediation. The main function of banks in a financial system is the intermediation role of indirect financing. This traditional function is anticipated to be the primary source of revenue to the bank, a component of bank income, referred to as the interest income. The bank’s interest income is from credit extended to their clients and the income from investments. It represents margin arising from interest on loans & investments and the interest paid by the bank to depositors or other banks.

The deregulation of the Nigerian financial system in 1986 ushered in stiff competition that necessitated the restructuring and recapitalization of banks, which made Nigerian banks opt for diversification of their revenue from interest income (traditional source) to non-interest income (non-traditional source). Diversifying into non-interest income does not affect the interest income; banks also earn additional income from non-interest income by charging their customer a fee for every financial service rendered other than intermediation service (DeYoung & Rice, 2004). Non-interest income is not expected to affect the interest income but to serve as an additional source of income to DMBs.

Nigerian banks were faced with frequent reviews of regulations that affected the revenue generated by these banks. The Central Bank of Nigeria (CBN) in 2016 announced the eradication of commission on turnover (COT), which is a component of the non-interest income charged by banks on debit transactions initiated by the customer for the benefit of the third party because it contributes over 60% of the bank’s revenue in Nigeria. The abolished COT replaced the current account maintenance fee and reduced the bank revenue by 20%. This change of policy by CBN has reduced the DMBs’ non-interest income, which is likely to affect the bank performance in Nigeria adversely. DeYoung & Rice (2004) show that non-interest income forms 40% of the operating income of commercial banks in the United States (U.S.).

The import of non-interest income has been advanced by Bian et al. (2015), but Nigerian DMBs have been seriously affected as global crude oil price instability has a far-reaching effect on banks’ non-performing loans. More so, the 2016 full implementation of Treasury Single Account (TSA) in Nigeria leading to the withdrawal of all government accounts from banks has deprived DMBs of over N1 trillion (Ndubuaku et al., 2016), thus reducing bank capital and their loanable capacity, thereby leading to more dependence on non-interest income to augmenting the reduced interest income for survival. This condition has necessitated an investigation into the relationship between non-interest income and DMBs’ performance in Nigeria.

Another crucial factor influencing investors’ behavior is inflation, as it allows them to switch to more favorable investment opportunities that pay higher returns; this process is known as disintermediation (Edward & Mishkin, 1995). This process could force banks to venture into non-traditional services. Some banks’ average interest rate on demand deposit in Nigeria is 4.2%, while the prime and maximum lending rate on general commerce
is 15% and 30%, respectively. Investors have various windows in which they can invest their funds. For instance, the Treasury bill pays a guaranteed average interest of 11%, and the mutual fund pays 10%. Also, the FinTech companies PiggyVest and Cowrywise offer the least interest rate of 10% on savings per annum that are all legitimate investments. Withdrawal of customer funds from DMBs into other investment windows reduced the capital base, liquidity level, the credits advanced to customers, and increased the cost incurred (Edward & Mishkin, 1995). This situation is likened to Allen & Santomero’s (2001) submission on U.S. banks when they believed that, for banks in the USA to regain their lost position due to competition, they need to reduce the interest on the loan and increase the interest paid on deposit. This condition has further shown the damaging effect of inflation on non-interest income, thereby affecting DMB performance in Nigeria (see Prabha et al., 2016).

Previous studies have documented the importance of bank size in the profitability drive of any DMBs. This study is hinged on the submission of Rogers & Sinkey (1999) that bank size is one of the determinants of bank involvement in non-traditional activities. Although, previous studies provides a different results about the relationship between bank size and bank performance. For instance, Flamini et al. (2009), Karakaya & Er (2013), Al-Tarawneh et al. (2017) are in line with Rogers & Sinkey’s assertion that bank size has a positive and significant relationship with bank performance. On the contrary, Athanasoglou et al. (2008) found no significant relationship between bank size and banks performance. Baek et al. (2018) affirmed that money incurred by banks in carrying out non-traditional activities is higher than what is incurred on traditional activities, which made the non-interest income to be more volatile.

Also, Karakaya & Er (2013); Al-Tarawneh et al. (2017) showed a positive linkage between credit creation of DMBs to the size of its profitability despite the extent of banks’ exposure to non-performing loans. Although, high non-performing loans in the bank’s portfolio could reduce the banks’ profitability, resulting in non-recovery of loans (bad debt). Other factors influencing bank performance as identified by literature include management expense (Guru et al., 2002; Al-Tarawneh et al., 2017); labor and capital productivity (Naceur & Goaied, 2001).

Several studies have established a linkage between non-interest income and the performance of banks, but the extent of the relationship between the duo remained unresolved in the Nigerian context. Despite extensive studies in this area, there is no consensus about the exact relationship between non-interest income and bank performance as different reasons were advanced for the mixed findings. The relationship is more complicated as it depends on the circumstances and the prevailing state of the economy. It is worth mentioning that most previous studies on non-interest income and bank performance nexus found positive impact (DeYoung & Rice, 2004; Craigwell & Maxwell, 2006; Demirgüç-Kunt & Huizinga, 2010; Karakaya & Er, 2013; Lee et al., 2014; Sun et al., 2017; Al-Tarawneh et al., 2017; Adedeji & Adedeji, 2018; Baek et al., 2018; Al-Slehat & Altameemi, 2021). In contrast, Mndeme (2015) found a negative impact.
However, this study contributes to the literature on non-interest income and bank performance in the following ways: First, studies on non-interest income concerning bank performance in Nigeria remain scarce as Adedeji & Adedeji (2018) study spanned through 2006 and 2015, which did not cover 2016 full implementation of Treasury Single Account (TSA) and its impact on bank performance. Second, the improvement on the number of sampled banks by this study to 13 DMBs representing about 93% quoted DMBs in Nigeria, excluding Jaiz Bank because it was quoted in 2017, as any sample below this may give a misleading result for policy recommendation. Third, this study considers only bank-specific variables, which the previous study on Nigeria did not give adequate attention to. Therefore, this study examines the impact of non-interest income on the performance of DMBs in Nigeria. The remaining part of this paper focuses on the methodology, followed by the empirical results and interpretation, and lastly, the conclusion and policy recommendation.

**METHODS**

This study employed an ex-post facto research design based on a quantitative description of historical financial data. In estimating the impact of non-interest income on DMBs’ performance in Nigeria, we adopted the model of Al-Tarawneh et al. (2017), which is expressed in a functional form equation 1.

\[
ROA = f (NonInt, CapRatio, Overhead, Loan, Size)
\]

(1)

Where \( ROA \) is return on asset that is a proxy for bank performance, \( NonInt \) represents non-interest income, \( CapRatio \) represents capital adequacy ratio, \( Overhead \) represents overhead expenses, \( Loan \) represents bank loan and \( Size \) represents bank size.

More so, equation 1 is therefore restated in a linear form in equation 2:

\[
ROA_{i,t} = a_0 + a_1 NonInt_{i,t} + a_2 CapRatio_{i,t} + a_3 Overhead_{i,t} + a_4 Loan_{i,t} + a_5 Size_{i,t} + \epsilon_{i,t}
\]

(2)

Where \( \epsilon \) represents error term and \( a_1, a_2, a_3, a_4 \) and \( a_5 \) are coefficients of the of the explanatory variables in the model.

The statistical technique employed was panel data analysis comprising of pooled regression, fixed effect regression and random effect regression model. We conducted the Hausman-test, Breusch-pagan LM test, Pesaran Cross-Section Dependence test, and Wald test to guide our decision on the model that best fit this study.

The Hausman test is a diagnostic test only for the REM estimates and not a diagnostic test for FEM. This condition is because the REM considers all time-invariant differences between variables/heterogeneity bias problems in its estimation. In contrast, FEM only considers time-invariant difference within a variable in its estimates, making it inappropriate for scholars to use only the Hausman test as the only diagnostic test (Clark & Linzer, 2012). This condition makes it imperative for scholars to carry out other diagnostic tests like the Breusch-pagan LM test, Pesaran Cross-Section Dependence test, and Wald test.
The REM believes that the difference among variables is uncorrelated and random among the explanatory variables in a model and assumes that the error terms in a model are uncorrelated with the estimates, which permits the usage of time-invariant variables an independent variable in the model. It is to be noted that the FEM helps to ascertain the time-invariant causes within a variable while the REM takes care of the time-invariant causes between variables in a model.

The REM is therefore specified for the purpose of this study as in equation 3:

\[ ROA_{i,t} = a_0 + a_1 NonInt_{i,t} + a_2 CapRatio_{i,t} + a_3 Overhead_{i,t} + a_4 Loan_{i,t} + a_5 Size_{i,t} + U_{i,t} + \epsilon_{i,t} \]  

(3)

We estimated the Wald test to identify the presence of heteroskedasticity among the variables in the model. The study also conducted the Breusch-Pagan LM test of independence and Pasaran Cross-sectional Dependence test in order to identify whether there is a presence of cross-sectional dependence in the residuals or not. The null hypothesis of this test is that the residuals are uncorrelated (Baltagi, 2008).

We extracted data from the financial statements of 13 quoted deposit money banks that charge interest in Nigeria out of the fourteen (14) listed DMBs on the Nigerian Stock Exchange (NSE) as of 31st December 2019, covering the period of 2012 to 2019. The remaining one (1) DMB, which is Jaiz bank, was excluded due to the unavailability of data because it was quoted on NSE in 2017. More so, the justification for choosing the year 2012 as the beginning period was since the TSA was introduced in the year 2012, which led to the withdrawal of government funds from accounts of DMBs in Nigeria and forced many of the DMBs to venture more into the non-interest income activities. Data extracted were analyzed with panel data involving thirteen (13) cross-sectional observations with a period of six (8) years.

RESULT AND DISCUSSION

Result

Table 1 presents the descriptive statistics of each variable used in this study. Findings revealed that Return on Asset (ROA) has an average mean value of 0.018952, which implies that the average return of DMBs is 1.8952% within the period while the median value of 1.5742%. The highest value of ROA is 19.8515%, with a minimum value of -0.09532, which has its standard deviation of 0.026118. Non-interest income has an average mean of 0.293822, which implies that an average bank in Nigeria generates ₦29.38 (29.38 Nigerian naira) for every ₦100 asset of the bank used that is expected to improve the bank revenue. Capital Adequacy Ratio (Capratio) has an average mean of 0.153376, which implies that an average bank in Nigeria has a capital adequacy ratio of 15.33%, which is higher than the minimum requirement set by the Central Bank of Nigeria, which was 15% for banks with international subsidiaries and 10% for banks without international subsidiaries. The loan has an average mean of 0.412917, which implies that an average bank in Nigeria gives out a loan of ₦41.29 out of every ₦100 of the bank’s asset. This data also signifies that the depositor’s funds are protected and ensure stability in the Nigerian banking system.
Table 1. Descriptive Statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Std Dev.</th>
<th>Obs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>0.018952</td>
<td>0.015742</td>
<td>0.198515</td>
<td>-0.09532</td>
<td>0.026118</td>
<td>104</td>
</tr>
<tr>
<td>NONINT</td>
<td>0.293822</td>
<td>0.257860</td>
<td>0.987750</td>
<td>0.000512</td>
<td>0.178492</td>
<td>104</td>
</tr>
<tr>
<td>CAPRATIO</td>
<td>0.153376</td>
<td>0.137215</td>
<td>0.973031</td>
<td>-1.5475</td>
<td>0.292371</td>
<td>104</td>
</tr>
<tr>
<td>LOAN</td>
<td>0.412917</td>
<td>0.430417</td>
<td>0.571904</td>
<td>0.000244</td>
<td>0.126680</td>
<td>104</td>
</tr>
<tr>
<td>OVERHEAD</td>
<td>0.641609</td>
<td>0.644741</td>
<td>1.063525</td>
<td>2.09E-05</td>
<td>0.215464</td>
<td>104</td>
</tr>
<tr>
<td>SIZE</td>
<td>12.14124</td>
<td>12.13963</td>
<td>12.91508</td>
<td>11.19453</td>
<td>0.395403</td>
<td>104</td>
</tr>
</tbody>
</table>

Source: Author Computation, 2020

Table 2 shows the correlation among the variables. It shows that non-interest income, capital adequacy ratio, and bank size have a positive relationship with return on the asset, which means when these three variables increase, return on asset increases by these proportion. In comparison, loan and Overhead have a negative relationship with return on the asset, which means when these two variables reduce, return on asset increases by these proportion. The capital adequacy ratio is positively related to non-interest income, which means capital adequacy moves in the same direction as non-interest income. At the same time, loan, Overhead, and size negatively correlate with non-interest income, which means an increase in these variables, will reduce non-interest income by their respective proportion. Capital adequacy ratio is negatively related to loan and Overhead but positively related to bank size. The loan is positively related to Overhead and bank size.
size. Overhead expenses are positively related to bank size, implying that an increase in the size of a bank increases the expenses incurred in the banking business.

Table 3 explains the pooled, random and fixed effect regression result. The pooled result shows that non-interest income has a positive effect on return on assets, implying that a unit increase in non-interest income will bring about 0.029246 increases in bank performance, which is significant. The capital adequacy ratio positively impacts return on assets, which means that a unit increase in capital adequacy ratio will bring about 0.037817 increases in bank performance, which is significant. Next, overhead does not impact the return on the asset. A loan does not affect the return on assets. Bank size positively impacts the return on an asset, implying that a unit increase in size will bring about a 0.011307 increase in bank performance.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pooled Result</th>
<th>Fixed Effect</th>
<th>Random Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONINT</td>
<td>0.029246***</td>
<td>0.002782</td>
<td>0.030675*</td>
</tr>
<tr>
<td></td>
<td>(0.016596)</td>
<td>(0.027986)</td>
<td>(0.020290)</td>
</tr>
<tr>
<td>CAPRATIO</td>
<td>0.037817*</td>
<td>0.036502*</td>
<td>0.035683*</td>
</tr>
<tr>
<td></td>
<td>(0.008780)</td>
<td>(0.012033)</td>
<td>(0.010061)</td>
</tr>
<tr>
<td>OVERHEAD</td>
<td>0.007451</td>
<td>-0.009857</td>
<td>-0.001886</td>
</tr>
<tr>
<td></td>
<td>(0.023133)</td>
<td>(0.036774)</td>
<td>(0.027251)</td>
</tr>
<tr>
<td>LOAN</td>
<td>-0.027199</td>
<td>0.048017</td>
<td>0.018368**</td>
</tr>
<tr>
<td></td>
<td>(0.041905)</td>
<td>(0.064016)</td>
<td>(0.048258)</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.011307**</td>
<td>-0.029332</td>
<td>0.009714</td>
</tr>
<tr>
<td></td>
<td>(0.005696)</td>
<td>(0.019534)</td>
<td>(0.008931)</td>
</tr>
</tbody>
</table>

| R-squared  | 0.368954          | 0.610118         | 0.279543         |
| Adjusted R-squared | 0.336758 | 0.491673 | 0.242785 |
| F-statistic | 11.45956 | 5.151064 | 7.604969 |
| Prob(F-statistic) | 0.000000 | 0.000000 | 0.000000 |
| Durbin-Watson stat | 1.315552 | 1.955927 | 1.799159 |
| Hausman Chi-Sq. Statistic (p-value) | 0.561866 (0.9897) |
| Wald Test (p-value) | 7.604969 (0.0000) |
| Breusch-Pagan LM (p-value) | 84.55172 (0.2865) |
| Pesaran CD (p-value) | 0.317646 (0.7508) |

Source: Author Computation, 2020
Note: *, ** and ***: significant at 1%, 5% and 10% respectively

The F-statistics of 11.45956 with Prob (F-statistic) of 0.000000 at a 5% level of significance indicates that the linear relationship between the independent and dependent
variable is statistically significant (i.e., the overall model), which means that the regression equation coefficients are not equal to zero and that the model is fit. The Durbin-Watson statistics of 1.315552 shows the presence of autocorrelation in the model.

The FEM result shows that non-interest income does not affect the return on assets. The capital adequacy ratio has a significant positive impact on return on assets, which means that a unit increase in capital adequacy ratio will bring about 0.036502 increases in significant bank performance. Overhead has no impact on the return on assets. The loan does not affect the return on assets. Besides that, bank size has no impact on return on assets.

The F-statistics of 5.151064 with Prob (F-statistic) of 0.000000 at a 5% level of significance indicates that the linear relationship between the independent and dependent variable is statistically significant (i.e., the overall model), which means that the regression equation coefficients are not equal to zero and that the model is fit. The Durbin-Watson statistics of 1.955927 show no autocorrelation in the model.

The REM result shows that non-interest income has a significant positive effect on return on assets, implying that a unit increase in non-interest income will bring about a 0.030675 increase in bank performance. The capital adequacy ratio has a significant positive impact on return on assets, which means that a unit increase in capital adequacy ratio will bring about a significant 0.035683 increase bank performance. Overhead has no impact on return on asset. A loan has a significant positive effect on the return on assets, which means that a unit increases in the loan will lead to a 0.018368 increase in bank performance. Bank size has no impact on the return on assets.

The F-statistics of 7.604969 with Prob(F-statistic) of 0.000005 at a 5% level of significance indicates that the linear relationship between the independent and dependent variable is statistically significant (i.e., the overall model), which means that the regression equation coefficients are not equal to zero and that the model is fit. The Durbin-Watson statistics of 1.799159 show no autocorrelation in the model.

The Wald test result shows that there is a presence of heteroskedasticity among the variance in the model, making it necessary to conduct both the FEM and REM. The Breusch-Pagan LM test for cross-sectional dependence and Pesaran cross-sectional dependence results show that the residuals across the entities are uncorrelated, which is one of the conditions to be satisfied before running FEM and REM. The Hausman test determines whether the errors (ui) are correlated or not with the null hypothesis that random effect is the preferred model and alternate hypothesis that fixed effect is the suitable model preferred the REM, which depicts that the errors (ui) are not correlated based on the chi-square statistics of 0.561866 that is not significant at 5%. This result implies that the REM is the suitable model to be used because it can illustrate more consistent and unbiased estimates as opposed fixed-effect model.

Discussion

The random effect regression result depicts that non-interest income has a significant positive impact on the return on assets, which implies that the higher the income generated
from the non-traditional activities of banks, the better the performance of the banks. This result revealed that an increase in the non-interest income of DMBs attracts additional income to the DMBs, eventually increasing the performance of the DMBs. This result conforms to the a priori expectation of and lends credence to Al-Tarawneh et al. (2017); Craigwell & Maxwell (2006); Adedeji & Adedeji (2018); Sun et al. (2017) but contradicts the findings of Mndeme (2015).

The capital adequacy ratio has a significant positive impact on bank performance which implies that the higher the capital adequacy ratio of banks, the higher the performance of the banks. This result shows that the increase in the bank is the capital base increases the liquidity level, the volume of credits advanced to customers, and improved the performance of the DMBs at large. This result is inconsistent with the a priori expectation and the findings of Al-Tarawneh et al. (2017) and Karayaka & Er (2013).

Overhead has an insignificant negative impact on bank performance, which signifies that the more money banks spend on their daily operation, the lower their performance. Banks are better off if they take caution and reduce the amount expended in running the banking business. This result is in line with the a priori expectation and prior study of Al-Tarawneh et al. (2017), Karayaka & Er (2013) but contrary to the findings of Naceur & Goaied (2001). However, non-interest income and revenue concentration affect bank risk (Williams, 2016; Hunjra et al., 2020). Cost-efficiency is key to generating and profiting from non-interest income (Isshaq et al., 2019).

The positive and significant impact of bank loans on bank performance implies that the higher the ratio of loan to total asset given to the deficit unit, the better the bank’s performance as this is expected to boost economic output due to the availability of credit to the productive sectors. This result aligns with a priori expectation and prior studies of Al-Tarawneh et al. (2017): Karayaka and Er (2013). Bank size was found to have an insignificant positive effect on return on assets, which means the higher the assets acquired by the bank, the better the bank’s performance. Acquisition of necessary assets essential for the banking business will improve the performance of the banks. This result aligns with the a priori expectation and the study of (Flamini et al., 2009; Al-Tarawneh et al., 2017; Karakaya & Er, 2013; Rogers & Sinkey, 1999), but contrary to the empirical finding of Athanasoglou et al. (2008).

Because of the above, our study found a significant impact of non-interest income on bank performance from 2012 – to 2019. It can be empirically established that the essential role of non-interest income on Nigerian bank performance cannot be denied. It has improved the earnings of DMBs and restored their confidence in the banking business without jeopardizing the growth and development of the Nigerian economy.

CONCLUSION

This study aims to investigate the impact of non-interest income on Deposit Money Banks (DMBs) performance in Nigeria using data from Nigeria covering the period 2012-2019. Panel regression estimation technique was used to determine the effect of
non-interest income on DMBs performance in Nigeria. Hausman test and other diagnostic tests preferred the random effect model as the suitable model for this study because it can illustrate more consistent estimates as opposed fixed effect model and ordinary least square technique.

Our study found that non-interest income significantly impacts deposit money banks’ performance in Nigeria. The empirical result shows that non-interest income plays an imperative role in the performance of DMBs in Nigeria due to its significant positive impact on the performance of DMBs. It is noted that capital adequacy ratio and bank loan are also crucial determinants of DMBs’ performance in Nigeria. Thus, increasing non-interest income, capital adequacy ratio, and bank loan activities will induce bank performance. Therefore, we recommend that Nigerian monetary authorities propose a policy to encourage DMBs to engage in non-traditional activities subject to periodic review to prevent the exploitation of the bank customers and the banking sector distress in the economy.

REFERENCES


