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# Income Mix and Liquidity of Nigerian Deposit Money Banks: Evidence from Dynamic Panel Models

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**Abstract**
Liquidity crunch is one of the greatest challenges that deposit money banks are confronted with which negatively affect their strength and stability and ultimately leading to collapse of some. Arising from this, the study focused on the "effect of income mix on liquidity of Nigerian deposit money banks."The study adopted an *ex post facto* research design, while ten out of all the listed banks were purposefully selected. The study obtained secondary data from the annual reports and accounts of the sampled banks from 2008 to 2017. Series of preliminary analyses involving descriptive and correlation analyses were conducted while generalized method of moment was employed in testing the hypotheses. The study found that all the variables of interest on income mix individually exhibit no significant effect on liquidity ($P > 0.05$), in effect, ratio of interest income, fee and commission income, foreign exchange income and other income were found to influence liquidity negatively while investment income was found to exert positive effect on liquidity. The study's conclusion arising from the findings is that income mix has significant positive joint effect on liquidity management. Arising from the conclusion, the study recommends that bank should keep diversifying their income base as such strategy significantly improves liquidity, while also improving on the interest income, fee and commission income, foreign exchange income and other income.

## 1.1 Introduction

The banking sector is one of the important sectors in most developing economies of the world as effectiveness and efficiency in the running of those economies cannot be achieved in isolate of finance from the banking sector; given the bank based financial structure of most developingcountries arising from of lack of developed financial market. The banking sector has been considered by Bagh, Khan, Azad, Saddique and Khan (2017) as the backbone of an economy due to the significant prospect it has on the economic growth and development. The banking sector contributes positively and significantly to the overall growth and sustainability of Nigerian economy through different channels; the most apparent and paramount of which is its 'intermediation role'. Financial intermediation involves pooling of fund from the surplus unit where they are not needed immediately to the deficit unit where they are needed for productive investment. Such role assists those with feasible and viable business ideas to finance such ideas; while it also assists depositors to defer their consumption with the aim of having more in the future.

Primarily, businesses exist to make profit, which is also the case for banking business; but as good as profitability is, it cannot be achieved without optimum liquidity. Therefore, firms must strike a balance between liquidity and profitability so as to attain financial equilibrium that will put both goals at optimum level. Efficient financial intermediation according to Idowu, Essien and Adegboyega (2017) is a product of banks managers' purposeful attention to balancing the dilemma between liquidity and profitability as the extreme pursuit of one at expense of other will lead banks to bankruptcy. Liquidity is a cardinal measure of bank's performance and its strength as bank cannot perform its intermediation role from which it earns its substantial proportion of income (interest income) and as well affect positively the growth of an economy in an efficient and desirable manner without optimum liquidity. Liquidity in the banking sector according to Agbada and Osuji (2013) refers to the ability of banks to meet up with short term maturing obligations to its depositors and creditors and as well as being able to legitimate new loan demand while abiding by existing reserve requirements. Liquidity is used by different stakeholders and monetary authorities to measure the strength of the bank in performing its intermediation role which enhances productive investment. Bassey and Moses (2015)regarded liquidity and profitability as the principal measures of performance by the key stakeholders of banks. While liquidity is a

variable of concern to depositors and creditors, profitability is of paramount relevance to shareholders in measuring return on their investment upon which their shareholders wealth minimization significantly relies. Other stakeholders like government are also interested in the financial performance so as to ascertain the amount of tax payables by the bank and the time such is due for payment. It can therefore be asserted that the confidence of banks' depositors significantly relies on their liquidity, as liquid banks are able to meet up with the withdrawal demand of depositors which in turn encourages depositors to deposit more money.

Banks in the recent time operate in a competitive, dynamic, technology based and volatile financial environment that is characterized by regulatory pressures (capital requirements) and volatility of interest income. These developments have necessitated banks to increase their streams of income so as to survive and maintain their going concern in the light of these recent changes in their operational environments Saqiq and Agba, 2016, Ismail, Hanif, Choudhary & Ahmad, 2015). Arising from the quest to remain liquid and profitable in the challenging environment they operate, banks are consideringsourcing for additional income outside interest as a means to remain competitive, profitable, liquid, efficient and been able to withstand global and local challenges. The strategy of achieving this goal is referred to as "income mix or diversification". Income mix or diversification in the banking sector refers to the diversification of banks source of revenue outside their traditional interest income which accrue from their traditional lending business. Non-interest income includes activities such as income from trading and securitization, investment banking and advisory fees, brokerage commissions, venture capital, and fiduciary income, and gains on non hedging derivatives.

It has been theoretical established that diversification is necessary in reducing assets risks (see Markowitz, 1952) of which liquidity risk is one of the greatest risk that threaten banks survival.One of the ways the bank can improve its liquidity is to generate more income which can be achieved by extending their revenue base outside interest income. Diversification also assist banks in reducing credit risks because as they generate income from other sources outside interest income, they are shielded from the negative effect which can arise from the risk of no repayment of principal amount of loan by the borrowers let alone the interest.

Noninterest income refers to income earned by banks from other operational activities aside from traditional interest source. Noninterest income according to Damankah, Anku-tsede

andAmankwaa (2014) refers to income that accrues to a bank from sources outside their traditional interest income. Non interest income has occupied a significant proportion of the entire banking sector income in developed countries like United State of America. Deyoung and Rice (2004) opined that the proportion of non interest income has increased astronomically in the recent time as it accounts for more than forty percent of the entire banking sector arising from increase reliant on fees, fiduciary income, service charges, trading revenue and other operating income (Stiroh, 2006). Diversification in the banking sector is a useful tool for managing and mitigating risk and improving the volume of income that is generated by them. Such income posits the sector to be able to perform their fundamental financial intermediary function efficiently as this improves profitability from the non-interest income source as most income source from non-interest based are associated with less cost and risks.  Increase in noninterest income therefore increases overall banks profit which can be used to grow the banking sector and increase the overall liquidity.  Depositors will have confidence in them. Such development has significant positive effect on financial intermediation as banks that are able to generate more income are posited to have more funds to advance to borrowers to finance productive investment which induce output and economic growth positively. Fee based income are considered to be stable as they mostly involve services which the beneficiaries are expected to pay for at a spot.

Some previous studies have attempted to show that income mix measures influence the financial performance of businesses in general and banks in particular. While they seem to focus on effect of income mix on profitability, little attentions have been given to the area of income mix and liquidity performance of banks in Nigeria. For instance, study by Damankah, Anku-tsede, Amankwaa and Eliasu(2014) revealed that interest incomeis the main driver of profitability of commercial banks in Ghana while non interest income was found to play augmenting role. The cardinal issue this study therefore attempts to address is to determine whether banks diversification outside interest income will improve their liquidity significantly and positively or otherwise. Unlike some prior studies undertaken by some research such as  Cetin (2018) have mainly focused on the effect of income mix on profitability; this study attempts to investigate the reaction  of bank liquidity in response to stimuli provided by the various income mix measures in Nigeria. The logical point of divergence is to determine the effect of income mix on liquidity of deposit money banks in

Nigeria; while given preference to banks size in sample selection. Arisingfrom these, the study conducted an empirical investigation on income mix and liquidity of the Nigerian banking sector.

## 2. 0 Literature Review

## 2.1 Theoretical Review

The modern portfolio theory is traceable to Markowitz (1952)which originated from his paper presented on 'portfolio selection' published by journal of finance in 1952. It is an investment theory which focused on the idea of a risk-averse investor trying to maximize future returns from an overall asset given a level of risk by investing them into different uncorrelated investments,emphasizing that risk is an inherent part of higher reward. It focuses on the diversification of investments so as to mitigate unsystematic risks that is peculiar to a specific class of asset in the market.The theory is based on the assumption that all investor's aim to maximize return for any level of Risk. Risk can be minimised by creating a diversified portfolio of unassociated assets. The theory also has its demerits; firstit assumes that investors are rational: this assumption is not always real as most investors may not have the finance knowledge on which portfolio will earn optimum return given a level of risk.

The bulk of this work will be anchored on this theory as it emphasizes committing investors' assets to series of uncorrelated investments so as to reduce risk and optimize income. This theory therefore gains its relevance in this study as incomes mix or diversification also aims at reducing banks risk and optimizing its profit by using banks assets to generate income from different sources as against restricting its overall income to their traditional interest spread income arising from interest. A reduction in risk that will give rise to higher returns is expected to  have a tricycle positive effect on liquidity.

## 2.2 Empirical Review

Recent studies have focused on the effect of income diversification on performance of banks. In this direction, Cetin (2018) focused on interest income and profitability of commercial banks in Turkey. The result of the regression analysis revealed that noninterest income exerts significant positive influence on net income of Turkish commercial banks.In Bangladesh, Rahman, Uddin, and Moudud-Ul-Huq (2015) focused on the determinants of profitability like liquidity, non interest income, off-balance sheet activities, bank size, capital strength, credit risk, ownership structure, cost efficiency, and inflation of sample of 25

commercial banks for the period 2006-2013. The results of the study showed that cost efficiency and off-balance sheet activities have negative impact on profitability meanwhile there is a positive impact from loan intensity and capital strength on bank profitability. More so, findings further suggest that credit risk, and Non-interest income is found to be important determinants of net interest margin (NIM). It was also found that there is a positive relationship between size and (ROA), and that inflation has a negative relation to (ROA) and (ROE).
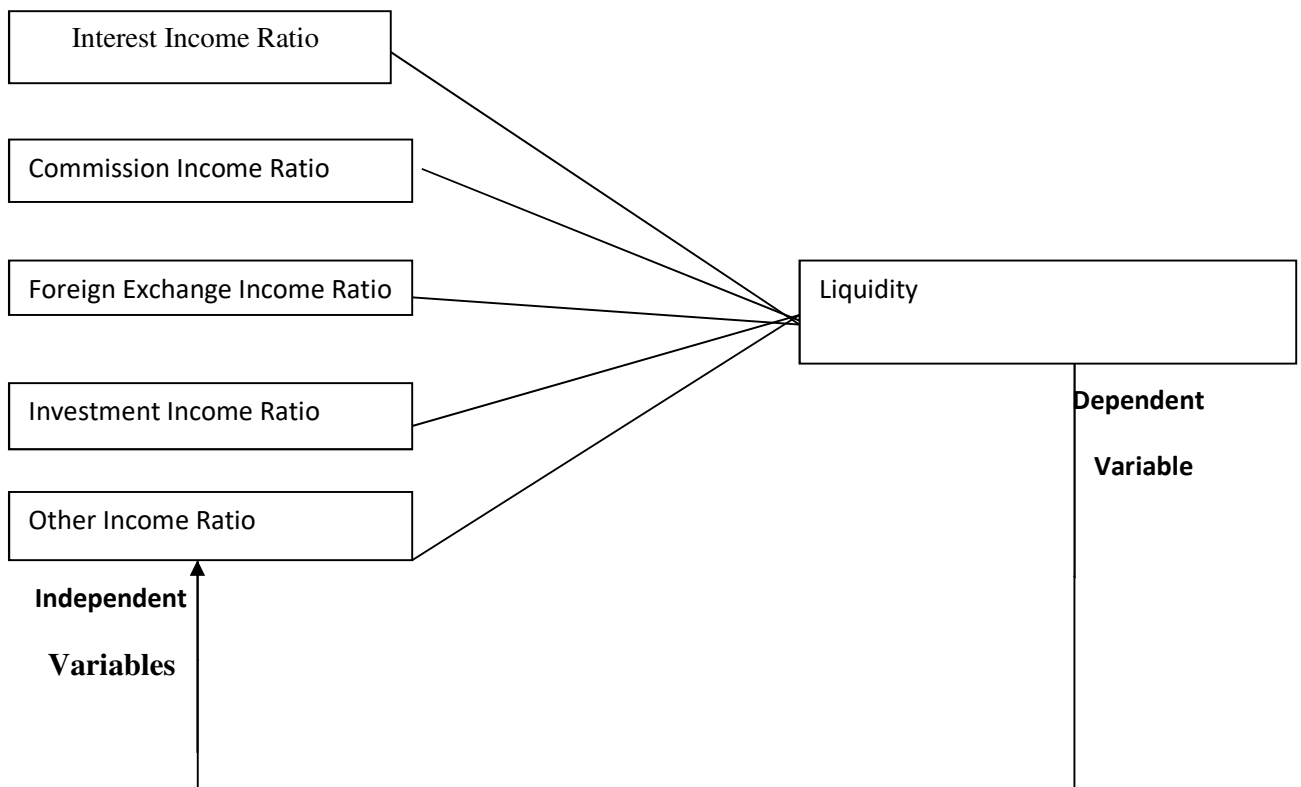
In the same direction, Andrzejuk (2019) conducted an investigation which was achieved by sampling 12 banks in Lienchtenstein private banks. The result of the correlation analysis reveals that non-interest to interest ratio is negatively but insignificantly correlated with return on asset and return on equity of the sampled banks. Study by Lee,Hsieh and Yang(2014) which examined the impact of diversification on 29 Asia Pacific countries and found that revenue diversification can increase the banking performance by splitting the countries into two groups i.e. bank based group and market based group. Diversification positively affects the performance of bank based group countries; moreover they have also explained the impact of financial reforms on relationship between diversification and performance of banks operating in different countries.

In India,the investigation of relationship of income diversification, asset quality with bank profitability of 46 listed public and private banks was the prime objective of empirical investigation by Bapat and Sagar (2016). The study explored the secondary data obtained from the annual accounts of the sampled banks while adopting an ex post facto research design. The finding obtained from the result of statistical and econometrical analyses provides empirical argument in favourof significant difference running between government and private banks for measure of diversification. However, there was no significance difference between income diversification measures on the basis of bank size. Further finding from the study revealed that non-performing asset has negative relationship with return on asset, while diversification was found to exert significant positive influence on return on asset in the recent two years. The implication of this finding is that size is not push factor for diversification in the banking sector.

In Ghana, Damankahet al. (2014) focused on the effect of income diversification on financial stability in Ghanaian banking sector. The objective of the study was achieved by sourcing data from the annual reports of the sampled banks in Ghana within a time frame of 2002-2011. The data were analyzed by using descriptive statistics, correlation and regression analysis. The result obtained from the regression revealed that interest income is the main driver of profitability in the Ghanaian banking sector; while the non-interest income was found to play an augmenting role in the case of short fall in interest income. Nisar,Peng, Wang and Ashraf (2018) conducted study which focused on banks diversification and financial performance and stability from the perspective ofsome selected countries in SouthAsia. The study employed regression and correlation analysis as analytical tools for estimating the models built for the study based on data obtained from the annual reports and accounts of the sampled 200 banks. The result of the estimation technique revealed that revenue diversification has significant positive joint effect on profitability and stability of sampled banks; furthermore, findings revealed that fees and commission incomes exerts negative effect on profitability and stability but other non- interest income has a positive effect on profitability and stability in Asian commercial banks

The estimation of the different determinants of bank fee income in the European Countries was the basis of study by Vozková and Teplý(2018). They argued in favour of fee commission income as a means of enabling banks to withstanding competition in global and local market arising from technological improvement. The study employed system generalized method of moment in analyzing secondary data obtained from the annual reports of sampled banks in the European Union. The study found that competition, capital adequacy (Equity to asset ratio) and deposit ratio asset ratio arethe main driver of fee based income in the European Union.The findings imply that banks competition and capital adequacy are capable of triggering banks to diversify their interest based. This is desirables as competition increases the efficiency, effectiveness and cost reduction in the rendering of banks services. The direction of empirical investigation by Wan, Li Wang , Liu and Bizhen Chen(2016) was towards rural households in China. The study critically examined the effect of income diversification on rural households bearing in mind that china is income of households during drought their income is adversely affected. The study administered questionnaire to 291 residents in 13 cities northern parts of china. The finding from the analysis of the

datarevealed that rural households diversified portfolio of income and it was further empirically established that diversified sources of income assists the rural dwellers to be less vulnerable to drought.

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┌─────────────────────────┐
│   Interest Income Ratio  │──────────┐
└─────────────────────────┘          │
┌─────────────────────────┐          │
│  Commission Income Ratio │          │      ┌──────────────────────┐
└─────────────────────────┘          │      │  Liquidity           │
┌─────────────────────────┐          ├──────│                      │
│ Foreign Exchange Income  │──────────┤      └──────────────────────┘
│          Ratio           │          │           Dependent
└─────────────────────────┘          │
┌─────────────────────────┐          │            Variable
│  Investment Income Ratio │──────────┤
└─────────────────────────┘          │
┌─────────────────────────┐          │
│    Other Income Ratio    │──────────┘
└─────────────────────────┘
     Independent
      Variables
```

**Researchers Conceptual Model 2019**

## 3 Research Methods

### 3.1 Research Design

The study adopted an *ex-post facto* research design. The adoption of this sampling technique is informed by our choice of extracting relevant data from annual reports and financial statements of the sampled banks which relate to invents that have happened in the past.

### 3.2 Source of Data

Secondary source of data which involved extracting relevant data from the published accounts of the sampled banks was used.

### 3.3Population, sample and sampling technique

The study population is the entire banks listed on the Nigerian Stock Exchange, while the sample size is 10 selected via purposeful sampling technique.

### 3.4 Data analysis instrument

Generalized method of moment was used in testing the hypotheses of the study.

### 3.5 Variable description and development of hypotheses

**Dependent variable**

Current Ratio (CR). This is the only dependent variable for the study. It is one of the variables used by banks to measure how liquid they are in meeting up with short term maturing obligations such as withdrawal demand from depositors**.**

**Independent variables**

Five independent variables have been used by the study. The variables are used to proxy income mix and they include:

Interest income ratio (IR): The interest income ratio shows the proportion of bank income that accrues from the traditional business of financial intermediation of fund. This represents a veritable source of income generation to the banking sector in Nigeria.

Commission Income Ratio: this shows the proportion of bank income that is generated from fee bases activities. Such include cost on transaction.

Foreign Exchange Income Ratio: This shows income generated from foreign exchange transaction such as buying and selling of foreign exchange and other foreign exchange services rendered to customers.

Investment Ratio: This shows proportion of bank income that arises from investment of fund in securities and so on.

Other Income Ratio: This refers to ratio of income from other sources outside those mentioned above.

### 3.6 Model specification

CR=f (Interest ratio, commission ratio, foreign exchange ratio,

investment ratio and other) ---------------------------------------------------------------------(1)

$CR_{it} = \beta_0 + \beta_1 CR(-1)_{it}\beta_2 + IR_{it} + \beta_{13}CMR_{it} + \beta_4 FER_{it} + \beta_5 ITR_{it} + \beta_6 OR_{it} + e_{it}$------------------------(2)
this model is similar to that of Thair and Kadummi (2017) stated in the equations below:
Where:

$Cr_{it}$ = Currentratio of bank i in period t, CR(-1) = a period lag of Currentratio of bank i in period t, $IR_{it}$ = Ratio of interest income in the overall banks income of bank in period t, $CMR_{it}$ = ratio of commission income as a percentage of banks total income of bank i in period t, FER = ratio of foreign exchange income as a proportion banks overall income of bank i in period t, $ITR_{it}$ = ratio of investment income over total income of bank i in period t; and$OR_{it}$ = other operating income as a proportion of total income of bank i in period t

**3.7 Measurement**

**Table 3. 7. 1:** Measurement of the Study's Variables

| Variable | Acronym | Measure | Expected effect |
|---|---|---|---|
| Dependent variables | | | |
| Liquidity( Current Ratio) | CR | <u>Current Assets</u><br>Current Liabilities | |
| Independent variables | | | |
| Interest Income Ratio | IR | <u>Interest Income</u><br>Total Income | + |
| Commission Income Ratio | CMR | <u>Fees and Commission Income</u><br>TotalIncome | + |
| Foreign Exchange Income Ratio | FER | <u>Foreign Exchange Income</u><br>Total Income | + |
| Investment Income Ratio | ITR | <u>Investment Income</u><br>Total Income | + |
| Other Income Ratio | OR | <u>Other Income</u><br>Total Income | + |

*Source: Researchers' Compilation*

**4.0 Results and Discussions**

**4.1 Descriptive Statistics**

Table 1 below shows the characteristics of the data used in the study. All the variables under the study have positive mean value; interest R is 77%, commission ratio is 14%, foreign E is 4%, investment R is 5% while CR has a ratio of 111%. Furthermore, the findings relating to the median suggest that the variables are normally distributed has they all have a value close to their mean values. It was also observed that all the variables are stable given their value of standarddeviation. All the variables apart from commission ratio are positively skewed. All the variables are leptokurtic since their value are greater than three (3) which implies that the variables produce high extreme outliers than those of the normal distribution.

**Table 1:** Summary of Descriptive Statistics

**Source: researchers' computation using E-views 9**

| Descriptor | Interest R | Comm R | Foreign R | Investment R | Other | CR |
|---|---|---|---|---|---|---|
| Mean | 0.771981 | 0.139527 | 0.041116 | 0.018980 | 0.051866 | 1.108974 |
| Median | 0.778241 | 0.144816 | 0.028984 | 0.009258 | 0.024034 | 1.099661 |
| Std. Dev. | 0.070809 | 0.054674 | 0.047718 | 0.034491 | 0.128521 | 0.223455 |
| Skewness | 0.147237 | -0.731237 | 1.923983 | 4.087451 | 5.359797 | 1.416580 |
| Kurtosis | 4.230070 | 3.825942 | 7.523868 | 21.59271 | 34.24099 | 9.192768 |
| Obs | 100 | 100 | 100 | 100 | 100 | 100 |

**4.2: Correlation**

Table 2 below shows the Correlation results of the variables. As shown from the correlation matrix, the correlation coefficients between various independent interest income ratio, fee and commission income ratio, foreign exchange ratio, investment income ratio, other income ratio and dependent variable liquidity ratio are less than the threshold of 0.8.

**Table 2:** Summary of  CorrelationMatrix

|        | IR        | CMR       | FER       | ITR      | OR        | CR       |
|--------|-----------|-----------|-----------|----------|-----------|----------|
| IR     | 1.000000  |           |           |          |           |          |
| CMR    | -0.336674 | 1.000000  |           |          |           |          |
| FER    | -0.219020 | -0.371571 | 1.000000  |          |           |          |
| ITR    | -0.231591 | 0.103976  | -0.043516 | 1.000000 |           |          |
| OR     | -0.329050 | 0.103114  | -0.156210 | 0.412953 | 1.000000  |          |
| CR     | 0.119538  | -0.235788 | 0.067488  | 0.018532 | -0.176335 | 1.000000 |

**Source: Authors' Computation using E-views 9**

**Table 3:** Pooled Effect of Income Mix on Liquidity Management

| GENERALISED METHOD OF MOMENT | | | | |
|---|---|---|---|---|
| **Dependent Variable: ROA** | | | | |
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **Prob.** |
| **C** | 0.738380 | 0.363538 | 2.031092 | 0.0454 |
| CR(-1) | 0.529450 | 0.098582 | 5.370636 | 0.0000 |
| IR | -0.072869 | 0.371959 | -0.195905 | 0.8452 |
| CMR | -0.878654 | 0.471136 | -1.864971 | 0.0657 |
| FER | -0.383043 | 0.500539 | -0.765261 | 0.4463 |
| ITR | 0.771816 | 0.624901 | 1.235102 | 0.2203 |
| OR | -0.453568 | 0.261602 | -1.733811 | 0.0867 |
| R-squared | | | | 0.345779 |
| Adjusted R-squared | | | | 0.298486 |
| J-statistic | | | | 83.00000 |
| Prob(J-statistic) | | | | 0.000000 |
| DW | | | | 1.973684 |

**Source: Authors' Computation using E-views 9**

The result of the table 3 above revealed that a period lag of liquidity management in the banking sector has significant positive effect on current year liquidity at 5% level of significance. This means that past year liquidity management of Nigerian deposit money

banks is needed for current year liquidity management. The finding further revealed that a unit increase in a period lag of liquidity management will translate to almost 74% increase in current year liquidity management ordinary share capital.Thisimpliesthat previous year liquidity management is needed in improving current liquidity management.

Finding on the effect of ratio of interest income as a proportion of the entire banks income as proxy for income mix revealed that interest ratio has no significant negative effect on liquidity management of listed deposit money banks in Nigeria. The coefficient of -0.072869implies that a unit increase in interest income will lead to 7% reduction in liquidity ratio of deposit money banks and it was also found not to be significant.The implication of this finding is that interest income is not an important driver of liquidity in the Nigerian banking sector. The negative coefficient further confirmed that liquidity is inversely affected by interest income; implying that the higher the interest income in the overall banks' income, the lower the liquidity. More so, the negative coefficient can better be explained by the facts that most banks depends solely on interest income and they are willing to channel substantial part of deposit and assets on lending which may lead to granting loan facilities to defaulters who may not pay the principal and the interest; most of which may be written up as bad debt, and thus the reduce their liquid assets. The result of this finding contradicts finding by Damankah et al. (2014), which found that interest income is the main driver of profitability in Ghanaian banks.

Arising from this, we accept the null hypothesis ($H_{01}$) interest income ratio has no significant negative effect on liquidity of listed deposit money banks in Nigeria

The finding relating to effect of commission income on liquidity management reveals a negative and insignificant effect of the independent variable on the dependent variable with a coefficient of -0.878654. The finding regarding the negative coefficient of -0.878654implies that a unit increase in the ratio commission income in the overall banks' income will translate to almost 88%decrease in liquidity management. The implication of the findings is that banks in Nigeria do not derive sufficient income from commission and any attempt by them to increase the revenue from this source may shift banks attention away from other veritable sources of income generation which will reduce the overall income of the bank and thus reduce the liquidity. This finding is in line with that of Nisar et al (2018)which found

that fees and commission income has significant effect on performance of Asian commercial banks.

Arising from this, we accept the null hypothesis($H_{02}$) that fees and commission income has no significant effect on liquidity of listed deposit money banks in Nigeria.

The findings as to the effect of ratio of foreign exchange income on liquidity management shows a coefficient of -0.383043 with corresponding probability of 0.4463 which implies that unit increase in foreign exchange income will lead to corresponding 38%reduction in banks liquidity. The probability value also shows that it exerts no significant effect on liquidity. Therefore, finding reveals that foreign exchange has no significantnegative effect on liquidity management. The implication of the finding is that as banks trades more on foreign exchange transactions which is characterized by a lot of risk of high volatility shifts the attention of the banking sector away from other sources of revenue generation that can be add significantly to the value of liquid asset. Arising from the empirical result, we therefore accept the null hypothesis ($H_{02}$) that foreign exchange income has no significant positive effect on liquidity of Nigerian deposit money banks. This finding is in contrast with that of Nisar et al.(2018) which found that other noninterest income exerts positive influence on performance of Asian Banks.

Investment income was found to exert an insignificant positive effect on liquidity of deposit money banks in Nigeria. Even though the probability is found not to be significant, it still fair well compared to others as it is positively signed. This implies that further attempt by banks to improve investment income may contribute to improvement in liquidity of banks.A coefficient of 0.771816with corresponding probability of 0.2203which implies that unit increase in investment income will lead to corresponding 77%improvement in banks liquidity. The probability value also shows that it exerts no significant effect on liquidity. Therefore, finding implies that investment incomehasinsignificant positive effect on liquidity management. The implication of the finding is that most investment by banks are rightly channeled to viable investment which earns justifiable income and improve liquidity positively, even though not significant. Arising from the empirical result, we therefore accept the null hypothesis ($H_{04}$) that investment income has no significant positive effect on liquidity management of Nigerian deposit money banks.

This finding is in line with that of Nisar et al. (2018) which found that other noninterest income has positive effect on profitability of Asian Banks.

Finding has to the effect of other operating income on liquidity management shows that it exerts an insignificant negative effect on liquidity management given a coefficient of -0.453568 with corresponding probability of 0.087 which is not significant at 5% level of significance. The implication of this finding is that for banks to generate income from other sources it must commit a lot of its liquid resources and when sufficient income is not generated; it reduces the liquidity balance. The result of this finding is in contrast with that of Nisar et al(2018) which found that other noninterest income exerts positive influence on performance of Asian Banks.

Arising from this, we accept the hypothesis($H_{05}$)that other income has no significant effect on profitability.

The adjusted $R^2$of 0.30 implies that 30% of variation in liquidity is caused by investment income. Also, the value of the j-statistics of 83 with corresponding probability of 0.000 implies that the model is jointly positively significant. The Durbin Watson Statistics value of 1.973 means that there is absence of auto-correlation since the figure of 1.973 is close to the threshold value of 2.

**Conclusion**

The study concluded from the result of the findings that income mix has significant positive joint effect on liquidity management of Nigerian deposit money banks. This is consistent with the findings of Lee et al. (2014), who found that revenue diversification positively affects performance of selected Asia pacific countries.

Recommendations

Arising from the findings, the recommendations that:

(1) The finding relating to the effect of previous year liquidity on current year liquidity carries the expected positive sign and was also found to be significant. Nigerian banks should therefore endeavour to maintain optimum liquidity position in the current period so as to improve future liquidity.

(2) The finding of interest income as a proportion of overall income shows negative but insignificant effect on liquidity management; this implies that most loan granted out from which interest income is expected to flow to a bank is mostly irrecoverable leading

to loss of principal and interest; this therefore exacerbate the liquidity position of most banks. Arising from this finding, the study recommends that banks should always evaluate and consider the ability and willingness of borrowers to pay back as a prerequisite for granting loan advances.

(3) Also, deposit money banks need to improve on the level of their commission income by either increasing their charge on services rendered to customers or by increasing their customer base so as to increase revenue from this stream and by so doing increase the level of their liquidity.

(4) Foreign exchange income was equally found to exert negative non significant effect on liquidity of Nigerian banks. Arising from this finding, we recommend that banks should always be cautious of their investment in foreign exchange; for the sake of liquidity, it is preferable and advisable that banks should always commit their investment in foreign exchange on short term basis so that it will easily be converted into most liquid asset (cash) so as to meet the withdrawal need of the depositors at request and as well as reduce foreign exchange risk that is associated mainly to foreign exchange fluctuation.

(5) We also recommend that banks should commit more funds to investment as it has the potential to favourable influence liquidity, a significant improvement in the level of investment income may influence to a significant extent the level of banks' liquidity. Lastly we recommend that banks should conduct their other operating activities in such a way that liquidity will be optimised

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