

FEDERAL UNIVERSITY OTUOKE JOURNAL OF MANAGEMENT SCIENCES

INTERBANK TRANSACTIONS AND PERFORMANCE OF NIGERIAN BANKS

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ABSTRACT

This paper sought to investigate the effect of interbank transactions on the performance of some selected quoted deposit money banks in Nigeria. In doing this, we considered all the quoted banks with relevant data in the banking sector that have consistently published their audited annual financial report up to 31st December, 2018. Thus, the analysis scope covers the period (2006-2015). We employed a sample of one hundred and forty (140) observations to ensure adequate observations for statistical testing – we adjusted an unbalanced panel data analysis due to the cross sectional nature of available data. The performance of these banks was measured in terms of returns on assets (RETOA) and net interest margin (GPMAG). We used panel data regression techniques, and the Hausman test was conducted on two unbalanced panel data models. Thereafter, two models were specified and estimated after certifying the normality of the data in the variables in the model. In the respective models, the performance of these banks was measured in terms of RETOA in model I and GPMAG in model II. And based on the outcome, the random effect result was prefer for model I while the fixed effect was preferred in model II. Empirical evidence indicates that interbank transactions is measured by interbank loan and deposit both exert positively on performance as measured by RETOA in model I though in an insignificant manner while in model II, interbank loan and interbank deposit impact positively and negatively respectively on performance as measured by GPMAG though in an insignificant manner too. Based on the outcome of this study, it implies that most quoted banks do not seem to partake in interbank transactions which are expected to impact positively on performance. We therefore recommend that banks should consider interbank loan and deposit relationships as less risky investment options and therefore learn to trust their sister banks to improving their performance.

Keywords: Interbank Loan, Interbank Deposit, Return on asset, Net Interest Margin

INTRODUCTION

Interbank transaction describes any loan, deposit, transaction or other relationship between two banks. Interbank transactions provide a great deal of liquidity to the market. Interbank interest rates are often used as benchmarks for other rates. At any moment,

some banks may find that they can attract more deposit than they can use, while others may be unable to exploit lending opportunities because of a shortage of funds; so non-bank depositors and end-users can more efficiently be brought together if banks transfer funds between themselves. Interbank transactions includes overnight lending, buying/selling of foreign exchange, and interbank deposit and loans respectively. Nautz and Scheithauer (2009), point out that information about interbank interest rates and their determination is required for active management of money market liquidity and short-term money market rates. Central banks influence money market interest rate through their deposit and lending rates and regulating the liquidity stance in the money markets. As Rochet and Tirole (1996) and Furfine (2001), observe that information about interest rates is also of interest from financial stability perspective. As overnight lending in the interbank market is uncollateralized, actual interest rates paid by a bank may indicate the solvency of the borrowing bank and the credit risk associated with the corresponding loan. In particular, banks perceived to enjoy an implicit government guarantee against default due to their possible systemic importance could face relatively lower overnight interest rates. The systemic importance of a bank is often gauged by a bank's size. Banks that are highly interconnected with other financial and non-financial institutions through their balance sheet linkages are often considered to be of systemic importance as well. However, actual interbank overnight interest rates are generally not public information, as loan's terms are agreed upon bilaterally between borrowing and lending banks. One indicator of actual overnight interest rates is indicative lending and borrowing rates quoted by major banks acting as market makers. However, indicative quotes may deviate from actual overnight interbank rates depending on borrower and lender characteristics and other factors related to the liquidity stance in the money market (Acharya & Merrouche, 2009). Hence, precise monitoring of interbank interest rates and careful study of the determination of overnight interest rates paid by different banks is generally not possible unless for banks overnight loans. Still, there can be a need to cross check information provided by banks as they can have incentives to under-report their borrowing costs. A well-functioning interbank market acts as an effectively channel for liquidity management in the banking system. It channels liquidity from institutions with surplus funds to those in need, thus allowing for more efficient financial intermediation and more effective monetary policy implementation. Oversupply or shortfalls in commercial banks' reserves arise from stochastic deposits and withdrawals by customers that create inter-temporal liquidity shocks in banks (Bruche & Suarez, 2010). Moreover, with an interbank market in place, banks ex ante will put aside less liquidity to cushion themselves from shocks. A large fraction of transactions in the economy are negotiated and settled in over-the-counter (OTC) markets. A specific OTC market among Deposit Money Banks in Nigeria is the overnight interbank lending market. The interbank lending market refers to the subset of bank-to-bank transactions that take place in the money market. The interbank lending market is also a market in which banks extend loans to one another for a specified term. Most interbank loans are for maturities of one week or less, the majority being overnight. Such loans are made at the interbank rate (also called the overnight rate irrespective of whether the term of the loan is overnight or not). Low transaction volume in this market form a major contributing factor to the financial crisis of 2007.

Banks are required to hold an adequate amount of liquid assets, such as cash, to manage any potential bank runs by clients. If a bank cannot meet these liquidity requirements, it will need to borrow money in the interbank market to cover the shortfall. Some banks, on the other hand, have excess liquid assets above and beyond the liquidity requirements. These banks may resort to lending such excesses in the interbank market, receiving interest on the assets. Banks use the interbank market to manage exchange rate and interest rate risk. The interbank rate is the rate of interest charged on short-term loans between banks. Banks borrow and lend money in the interbank lending market in order to manage liquidity and satisfy regulations such as reserve requirements. The interest rate charged depends on the availability of money in the market, on prevailing rates and on the specific terms of the contract, such as term length. There is a wide range of published interbank rates, including the NIBOR, the federal funds rate (USA), the LIBOR (UK) and the Euribor (Eurozone). Efficiency of the interbank market can however be viewed from the performance of banking sector. While the interbank market is assumed a priori and often modeled in the literature as a centralized exchange in which banks smooth liquidity shocks (e.g. Ho and Saunders, 1985; Bhattacharya and Gale, 1987; Freixas and Holthausen, 2005) in reality, the market is decentralized: deals are struck bilaterally between pairs of banks (Stigum and Crescenzi, 2007). This defining market feature may give rise to market inefficiencies (Duffie et al., 2005) and poor performance where small banks may be considered more risky than the large banks, with the latter being regarded as 'too-big-fail'. This may erode the importance of the interbank market in its role of liquidity management thereby compromising the effectiveness of monetary policies. Transactions between banks such as loans between banks and transfers between customers of different banks are settled across the books of a settlement bank. Banks need to have short-term liquidity available with their settlement bank to cover their debit posits. Such liquidity generally consists of certificates of deposit and deposits on banks' accounts with their settlement bank. There are various arguments in the literature concerning the relationship between interbank activities and performance of concerned banks, but we observe divergent views on what constitutes interbank activities and how the activities are operationalized in principle.

There have been several studies on the impact of interbank market on monetary policy, interbank leading and banking sector performance as well as interbank rates and liquidity management (Bache and Barnhardsen, 2009; Carlos, 2013). But we find relatively scanty studies concerning interbank transactions on the performance of deposit money banks especially in Nigeria. Especially since the recapitalization and consolidation policies which came at the wake of recent financial sector liberalization exercise, the nomenclature of the deposit money banks in Nigeria changed. This no doubt has prompted structural shift in the capital structure as well as general resource allocations cum investment opportunities/banking transactions in the banking sector. This study intends to bridge the existing gap in the literature by empirically investigating the effect of interbank transaction and performance giving consideration to interbank transactions such as loans, deposits and transfers which form the core areas in Nigerian banking system. It is noted that banks earn non-interest income from interbank transfers.

The main cardinal objective of this study is to examine the effect of interbank transactions on banks performance data from quoted Nigerian deposit money banks. Specifically, the study intends:

- i. To determine the effect of interbank loans on bank performance
- ii. To determine the effect of interbank deposits on bank performance

Based on the objectives of this study, the following null hypotheses would be tested:

Ho1: Interbank loan effect on bank performance is not significant

Ho2: Interbank deposits effect on bank performance is not significant

The remainder of this paper is structured as follows: the second part covers review of some related literature and theoretical framework while the methodology is provided in the third section. The empirical results and discussion is provided in section four. Finally, conclusion and recommendations are provided in section five.

LITERATURE REVIEW

Scanty empirical literature on the issue exists with varying and limited views. However, the review will begin with theoretical framework followed by related empirical studies. Previous studies have used structural and nonstructural approaches to investigate behavior of the banking market. Structural approaches are mainly based on the traditional industrial organization theory which focuses on the structure-conduct performance (SCP) paradigm and on the efficient structure paradigm. Literature based on structural approaches has investigated how the market concentration weakens the market competition by fostering collusive behavior among firms. Conversely, non-structural approaches assume that factors other than market structure and concentration may affect competitive behavior, such as entry/exit barriers and the general contestability of the market (Panzar & Rosse, 1987; Rosse & Panzar, 1977). This study model the interbank market in the spirit of Bhattacharya and Gale (1987), who in turn build on Diamond and Dybvig (1983). Banks face liquidity demand of varying intensity. Some may need to realize cash quickly due to demands of customers who draw on committed lines of credit or on their demandable deposits. Since idiosyncratic liquidity shocks are non-contractible, this creates a scope for an interbank market where banks with excess liquidity trade with banks in need of liquidity.

Banks can invest in liquid assets (cash), illiquid assets (loans), and in bonds. In their portfolio choice, they face a tradeoff between liquidity and return. Illiquid investments are profitable but risky. Banks can obtain funding liquidity in the unsecured interbank market by issuing claims on the illiquid investment, which has limited market liquidity. Due to the risk of illiquid investments, banks may become insolvent and thus unable to repay their interbank loan. Imperfect competition is examined in Acharya, Gromb, and Yorulmazer (2008). If liquidity-rich banks use their market power to extract surplus from liquidity-poor banks, a central bank can provide an outside option for the latter. Freixas, Martin, and Skeie (2008) show that when multiple, Pareto-ranked equilibria exist in the interbank market, a central bank can act as a coordination device for market participants and ensure that a more efficient equilibrium is reached. This makes unsecured interbank lending risky. To compensate lenders, borrowers have to pay a premium for funds obtained in the unsecured interbank market. This has the advantage of enhancing banks performance against bank concentration. By bank performance, generally it implies whether a bank has fared well within a trading period to realize its objectives. The only document that explains this is presumably the published financial statements. According to Rose (2001), a fair evaluation of any bank's performance should start by evaluating whether it has been able to achieve

the objectives set by management and stockholders. Certainly, many banks have their own unique objectives. Some wish to grow faster and achieve some long-range growth objective, others seem to prefer quiet life, minimizing risk and conveying the image of a sound bank, but with modest rewards to their shareholders. Ordinarily, stock prices and its behavior are deemed to reflect the performance of a firm. This is a market indicator and may not be reliable always. However, the size of the bank, the volume of deposit and its profitability could be deemed as more reliable performance indicators. For the purpose of this study, profitability indicators, precisely the Return on Equity Capital (ROE) and the returns on Assets (ROA) are used to assess bank performance. These ratios are indicators of management efficiency, and rate of returns. According to Rose, these profitability measures vary substantially over time and from one banking market to another. The ROE and ROA are popularly in use today. In real sense, interbank transactions are supposed to improve performance.

Empirical Studies

To the researchers' knowledge, Furfine (1999) is the first to document the existence of relationships in the US interbank market. He shows that large institutions form multiple relationships while smaller ones have few counterparties. Furfine (1999) argues that banking relationships play a role in the funds market for smaller institutions that choose to establish relationships to alleviate information asymmetries.

Furfine (2001) also considers that borrowing institutions may build relationships to establish that they are a good credit risk. In this paper, Furfine finds that fed funds rates reflect differences in the borrower's credit risk suggesting that banks monitor the risk present in their interbank transactions. Furfine's work was followed by empirical studies in other countries. Xu Hanfei (2004), by using ECM model, Xu studies the transmission mechanism of central bank loan interest rate to interbank loan interest rate transmission, and finds that the transmission mechanism is asymmetric and dynamic, and the adjustment that central bank transmits to refinancing interest rate is only about 60% direct conducted to the inter-bank market interest rates

In a joint presentation, Ulrike and Jurgen (2004), examined an interbank market model with a heterogeneous banking sector. They showed that banks participate in the interbank market because they differ in marginal costs of obtaining funds from the European Central Bank. Their model showed that this heterogeneity implies intermediation by banks with relatively low marginal costs. The resulting positive spread between the interbank market rate and the central bank rate is determined by transaction costs in the interbank market, total liquidity needs of the banking sector, costs of obtaining funds from the central bank, and the distribution of the latter across banks.

Iveri and Peydró-Alcalde (2005), using a unique dataset from India were able to identify the interbank commitments in order to test contagion in the banking system of an idiosyncratic shock caused due to a fraud in one of the banks. Interestingly, they find that the level of exposure with the failed bank is an important determinant of depositor runs. What makes their result even more intriguing is the fact that information on the exposure with the failed bank was not available to the depositors. Finally, they documented that outstanding interbank claims among other banks intensify the negative impact of the initial shock. Their results provide strong evidence in favour of financial linkages as an important mechanism for contagion and hold important implications for policy formulation.

Zheng and Du (2007) fit the inter-bank overnight rates by using EGARCH model, finding out the EGARCH (1, 3) model the best fitting one, which fully embodies the overnight lending market information asymmetry. They also do the short term prediction by EGARCH (1, 3) and obtain ideal forecasting effect, thereby determine a suitable model for China's interbank market interest rate forecasting consistent with findings obtained by Cocco, Gomes and Martins (2009). It was showed that, in the Portuguese interbank market, small banks rely more on relationships and that these relationships are established between banks with less correlated liquidity shocks. Similarly, Affinito (2012) shows that, in Italy, domestic banks also establish stable and strong relationships. On their part, Gianfranco and Pasquale La (2009), analyzed the behavior of the Italian e-MID unsecured interbank market during the 2008 financial turmoil, highlighting some peculiarities occurred in the last two years. For this purpose, they examined the interbank transactions within the euro area when the financial crisis started, both in the e-MID and in the over-the-counter interbank markets, and pointing out that the introduction of an anonymous and collateralized segment in the e-MID market since February 2009 may improve the liquidity distribution within the euro area.

The role of asymmetric information about credit risk is emphasized in Heider, Hoerova and Holthausen (2009). The model generates several possible regimes in the interbank market, including one in which trading breaks down. The regimes are akin to the developments prior to and during the 2007-2009 financial crises. Freixas and Jorge (2009) analyze the effects of interbank market imperfections for the transmission of monetary policy .Combining a nested logit model of bank deposit supply with a structural model of competition to measure the impact of the reference interest rates on public debt and interbank markets on the returns on deposits and funding policy of Spanish banks in the period 2003-2010. Carlos (2013), interbank rate was found to be more closely correlated with the return on deposit returns is significantly weaker in the crisis period 2008-2010. Counterfactual analysis shows a significant effect of the interbank rate and investment opportunities in public debt on deposit rates and bank profits, and that observed deposit rates are on average 115bp above collusive levels.

Baoqian, Cheng, Xikun (2012), employed historical time series data of commercial interbank, and examined the interest rate fluctuation distribution characteristics, indicating that EGARCH Model can better fit the rate volatility of the interbank market interest. Their paper calculates the value at risk (VAR) of five major commercial banks using EGARCH Model with such a conclusion that the difference that major commercial banks face is various. The interest risk of state-owned commercial banks and other financial institutions is more serious than the city commercial banks and foreign banks. The interest risk of rural credit cooperatives is the least serious. Carlos (2013), interbank rate was found to be more closely correlated with the return on deposits than the interest rate on public debt, but the connection between interbank rates and deposit returns is significantly weaker in the crisis period 2008-2010. Counterfactual analysis shows a significant effect of the interbank rate and investment opportunities in public debt on deposit rates and bank profits, and that observed deposit rates are on average 115bp above collusive levels.

Affinito (2013) tested the hypothesis of liquidity hoarding in the Italian banking system during the 2007-2011 global financial crises. According to this hypothesis, in periods of crisis, interbank markets stop working and central banks' interventions are ineffective

because banks hoard the liquidity injected rather than channeling it on to other banks and the real economy. The test uses monthly data at banking-group level for all intermediaries operating in Italy between January 1999 and August 2011. This is the first paper to use micro data to analyse the relationship between single banks' positions vis-à-vis the central bank and the interbank market. The results show that the Italian interbank market functioned well even during the crisis, and, contrary to widespread conjecture, the liquidity injected by the Eurosystem was intermediated among banks and towards the real economy. This finding is robust to the use of several estimation methods and data on the different segments of the money market.

Using broader definitions of the interbank market, Langfield, Liu and Ota (2014) and Lelyveld and Veld (2012) also find a core-periphery structure in the UK and Dutch interbank market, respectively. Consistent with their findings of sparse interbank networks, we see that most banks in the US interbank market establish stable relationships. While Arciero, Heijmans, Heuver, Massarenti, Picillo and vacirca (2016) and Temizsoy, Iori and Montes-Rojas (2017) using a theoretical model arrived at similar conclusion using a similar data set for the Italian e-Mid market. They show that lending and deposit rates are determined simultaneously, and estimations using the Ioan-deposit spread would be biased as a consequence. They find that banks do not use the interbank market only to close any funding gaps or surpluses, but allow them to be active as both lenders and depositors. Thus, there exists a Nash equilibrium in the model that allows all banks to meet their balance sheet constraints.

From the research evidence so far, there has not been a research output of related study from Nigeria on interbank transactions and performance. This study therefore makes an insight in this direction to fill the gap. In this paper, ROA and ROE were proxies for bank performance of the 14 Deposit Money Banks in Nigeria were selected while the extent of variation in these performance variables are affected by interbank lending and deposit.

METHODOLOGY

The population of this study therefore comprises of all the listed deposit money banks in the Nigerian Stock Exchange that have consistently published their annual reports as stipulated by law uptill 31st December, 2018. In doing this, we considered all the quoted banks with relevant data in the banking sector that have consistently published their audited annual financial reports up to 31st December, 2018. We employed a sample of one hundred and forty (140) observations, to ensure adequate observation for statistical testing; we adopted an unbalanced panel data analysis due to the cross sectional nature of the available data.

The models are functionally specified as:

RETOA = f(INTBAKL, INTBAKD, EQTTA, FASTA, FSIZE)

GPMAG = f(INTBAKL, INTBAKD, EQTTA, FASTA, FSIZE)

The econometric forms of the models are thus:

 $RETOA_{it} = \beta_0 + \beta_1 INTBAKL_{it} + \beta_2 INTBAKD_{it} + \beta_3 EQTTA_{it} + B_4 FASTA + \beta_5 FSIZE_{it} + U_{it} \dots (1)$ $GPMAG_{it} = \beta_0 + \beta_1 INTBAKL_{it} + \beta_2 INTBAKD_{it} + \beta_3 EQTTA_{it} + B_4 FASTA + \beta_5 FSIZE_{it} + U_{it} \dots (2)$

Empirical Results

We conducted the descriptive statistics, followed by the correlation analysis, thereafter, the Panel least squares method was used to estimate the specified model. The variables in the study include return on asset (RETOA), return on equity (RETOE), Net interest margin (GPMAG) all being the performance variables which form the dependent variable respectively, while the independent variables include interbank loan (INTBAKL) interbank deposit (INTBAKD), net difference between the interbank loan and interbank deposit (DIFFINT), and the control variables as firm size (FSIZE), asset tangibility (FASTA) and capital adequacy. The model specified was first tested to ensure normality of the data in the variables therein, thereafter, the descriptive statistics as well as the correlation analysis were conducted before the estimation of the model. Looking at the data collected for this study, there is evidence that most of the sampled banks never engaged in interbank deposit. We also observed that where some did, the magnitude was rather too small. For example, fidelity bank, Sterling bank, Unity bank, Wema bank and surprisingly, Zenith bank. It very surprising to note that such banks as fidelity bank, Unity bank and Zenith bank respectively have records of hugged sums of Net interest margin has showed in the data. And the question remains, if these banks in spite of their zero levels of interbank deposits have such high performance as measured by net interest margin, what then are the channels for their net interest earnings?

The descriptive statistics of the data on the variables show the mean for each of the variables, their maximum and minimum values and Jarque-Bera (JB) statistic which forms the normality test. The descriptive statistics provides an insight into the nature of the selected quoted firms that were used as samples in the study as well as the distribution of the data in the variables used in the model. Firstly, the little difference between the maximum and minimum values of firm size (SIZE) shows that the sampled firms are dominated by large and medium banks in terms of the size of the assets of the selected banks for this study. Secondly, we also observe that on the average, over the reference period, all the variables indicate positive values. This implies that there is high level of performance among the sampled quoted banks irrespective of their size and age. In addition, the relative low but though a positive average of the return on asset variable indicates that the selected banks were not able to generate reasonable returns of their asset with the level of management of their cash holdings and their operating efficiency not-withstanding.

On the other hand, the average values of both Net interest margin, interbank loans and capital adequacy variables show that the respective values of the variables of the sampled banks were very high and either being under-utilized, hence failed to generate reasonable returns on both asset and equity position. This justifies the low average value of return on asset variable (RETOA) which indicates (1.07636). For the average value of firm size which show (8.85793), this implies that the sampled firms are more of larger banks in terms of value of total assets. The average value of asset tangibility (4.08857) also show that on the average, the selected banks possess high asset tangibility, while the average value of net difference between interbank loan and deposit did show a low percentage of 10%. This implies that most of the sampled banks have more deposit with other banks but little or no loan to other banks. For example, Guaranty Trust bank, indicates more deposit with other banks, but fail to give out loans to other banks. Lastly, the Jarque-Bera (JB) statistics after adjusting for all missing data and extreme values show that all the variables are normally

distributed at 1% level of significance except for firm size (FSIZE) and net interest margin (GPMAG) which show significance at 10% and 5% levels respectively. This justifies the reliability of the data collected in the study to a great extent for drawing generalization.

In examining the association among the variables, we employed the Pearson correlation coefficient technique and the results are presented in Table 1 below.

	RETOA	RETOE	GPMAG	INTBAKL	INTBAKD	DIFFINT	EQTTA	FASTA	FSIZE
RETOA	1.0000								
RETOE	-0.0899	1.0000							
GPMAG	0.3952	0.0082	1.0000						
INTBAKL	0.0413	0.0442	0.0123	1.0000					
INTBAKD	0.0925	0.0688	0.0975	0.3244	1.0000				
DIFFINT	0.2361	0.0184	-0.0268	0.9219	-0.0672	1.000			
EQTTA	0.4679	0.0325	0.3171	0.1243	0.1775	0.0587	1.0000		
FASTA	-0.3034	0.0056	-0.2012	0.0903	-0.0087	0.0989	0.0138	1.0000	
FSIZE	0.1676	0.1172	0.2883	-0.1647	-0.0234	-0.1644	-0.0849	-0.5415	1.0000

Source: Author's computation (2019)

Table 1 above presents the degree of association between the performance variables (RETOA), (RETOE) and (GPMAG) which respectively form dependent variables, and the explanatory and control variables which include: INTBAKL, INTBAKD, EQTTA, FASTA and FSIZE respectively in the specified model. The results show that among the explanatory variables, all show positive association with all the dependent variables except difference in net interest (DIFFINT) which show negative association with Net interest margin (GPMAG) as a measure of performance in this study. With respect to the association among the explanatory and control variables, results indicate that all the variables except interbank deposit (INTBAKD) show negative association with difference between interbank loans and deposits. In addition, among the control variables in the model, FASTA and FSIZE does show negative association with all the explanatory variable (INTBAKD), while FSIZE indicate negative association with all the explanatory variables and other control variables respectively.

The correlation test also reveals that no two explanatory variables were perfectly correlated. This implies that there is absence of multi-collinearity problem in our model, this justifies that the variables are good enough for the regression. Multi-collinearity among explanatory variables may result to wrong signs or implausible magnitudes in the estimated model coefficients, and the bias of the standard errors of the coefficients.

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		0	
	Expected	RETOA	RETOA
	Sign	Fixed Effect)	(Random Effect)
С		-5.092	-5.092
		(-0.63)	(-0.63)
		[0.52]	[0.52]
INTBAKL	+	0.004	0.004
		(0.21)	(0.21)
		[0.82]	[0.82]
INTBAKD	+	0.001	0.001
		(0.02)	(0.02)
		[0.98]	[0.98]
EQTTA	+	0.239	0.239
		(6.50)	(6.43)
		[0.00]*	[0.00]*
FASTA	+	-0.618	-0.618
		(-3.28)	(-3.24)
		[0.00]*	[0.00]*
	+		
FSIZE		0.580	0.580
		(0.69)	(0.68)
		[0.48]	[0.49]
R-Squared		0.31	0.32
Adj-R-Squared		0.29	0.29
F-Statistic		12.4724(0.0)*	12.472(0.00)*
Hausman Test		-	3.1117(0.68)
N(n)		140(14)	140(14)

Table 2:	RETOA	Unbalanced	Panel	Regression	Results
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Table 2 above presents the two unbalanced panel data estimation results obtained when we estimated (the fixed effect and random effect versions of the RETOA model. The results reveal that there are insignificant difference in the magnitude and signs of the coefficients of the two results. The results obtained for the fixed effect show that the R-squared and adjusted R-squared values are 0.31 and 0.29 respectively. This indicates that all the independent variables jointly explain about 31% of the systematic variations in return to assets (RETOA) across the quoted sampled firms in the sector under review in Nigeria over the sampled period (2006-2015). The explanatory power of the model can be seen as very strong based on the F-statistics (12.4724) and its p-value (0.0) showing that the RETOA unbalanced panel fixed regression model is generally significant at 1% level. This implies that the variables in the model are strong determinants of performance as measured by returns on assets across the sampled firms over the reference period.

The result with respect to random effect technique shows a similar result but with slight difference. The R-squared and Adjusted R-squared values are 0.32 and 0.29 respectively. This indicates that all the independent variables jointly explain about 29% of the systematic variations in RETOA across the quoted sampled firms in the sector under review in Nigeria over the three-year period (2006-2015). The explanatory power of the model can be seen as very strong too. The F-statistics (12.4724) and its p-value (0.0) show that the Return to asset unbalanced panel random regression model indicate that it is

generally significant at 1% level. This implies that the variables in the model are strong determinants of performance across the sampled firms over the reference period.

In selecting from the two unbalanced panel data models, the Hausman test was conducted and the result shows a Chi-square and prob-value of (3.11177) and (0.68) respectively. This result implies that we should accept the null hypothesis (Ho) which assumes that random effect model is preferred to fixed effect model. This means that we should adopt the random effect panel regression results in our study for the discussion of findings, policy formulation and recommendation(s). On this note, we analyze the full result of the random effect technique. Looking at the coefficients of the random effect results, the empirical evidence shows that interbank loans which is signified by (INTBAKL) variable exerts a positive influence on RETOA, though it failed the significance test. This means that though there is a positive relation between interbank loans and performance in the deposit money banks but the effect is not significant. It also implies that a unit change in interbank loans as a result of efficient management of cash will lead to about 0.0047 unit increase in return on assets. This result suggests that we accept hypothesis one (Ho₁) which states that the effect of interbank loans on bank performance is not significant.

Similarly, the result also reveals the coefficient and p-value of interbank deposits (INTBAKD) variable as (0.0013) and (0.98) respectively. This implies a positive impact of interbank deposits on performance as measured by return on assets but in a non-significant manner. This outcome also implies that a unit change in interbank deposits due to efficient investment decisions of the selected banks has the tendency to lead to about 0.0013 unit increase in performance. This result suggests that we accept hypothesis two (Ho₂) which states that the effect of interbank deposits on performance is not significant. The result with respect to capital adequacy (EQTTA) variable shows coefficient and p-value of (0.23994) and (0.00) respectively. This means that capital adequacy exerts positively on performance as measured by return on assets. The result also indicates that the variable passed significance test at 1% level. This implies that a unit change in capital adequacy has the tendency bring about 0.23994 unit increase in performance in a significant manner.

Furthermore, the result with respect to other control variables in the model, for example, asset tangibility (FASTA) variable, indicates a negative (-0.6188) impact on performance, but passed the significance test at 1% level. This means that there is a negative relation between asset tangibility and performance. This is rather surprising, that as significant as asset tangibility seems to determine performance (that is, in terms of returns to the assets) the evidence prove contrary. It also implies that a unit change in asset tangibility will lead to about 0.6188 unit decrease in performance. This result is a pointer to question the kind of assets the sampled firms maintain. Lastly, looking at the effect of firm size (FSIZE) variable which is a control variable in the model, result indicates that firm size exert a positive and insignificant impact on performance. This means that though the size of the firm does necessarily influence the performance, but not in a significant manner. The result also show that the bigger the firm the more the tendency that its performance in terms of return on assets will keep increasing but in an insignificant manner. The model overall is satisfactory given the significance level of 1% of the model as revealed by the prob(F-statistic) value. This justifies the goodness of fit of the model especially for policy formulation purposes.

Next is to examine the empirical evidence with respect to the GPMAG model. The fixed and random effect estimation results are as presented and discussed below:

	Evposted	CDMAC	CDMAC
	Expected		(Dandam Effect)
C	Sign	Fixed Effect)	(Kandolli Effect)
t		96.269	48.100
		(3.25)	(1.87)
		[0.00]*	[0.06]
INTBAKL	+	0.027	0.030
		(0.41)	(0.49)
		[0.67]	[0.62]
INTBAKD	+	-0.310	0.152
		(-1.53)	(-0.85)
		[0.12]	[0.39]
ΕΟΤΤΛ	1	0.440	0.471
LQIIA	Ŧ	(2, 02)	(4, 40)
		(3.92)	(4.49)
		[0.00]*	[0.00]*
FASTA	+	-1.822	-1.302
		(-3.02)	(-2.33)
		[0.00]*	[0.02]**
	+		
FSIZE		-3.8111	1.276
		(-1.20)	(0.47)
		[0.23]	[0.63]
R-Squared		0.51	0.14
Adi-R-Squared		0.45	0.11
F-Statistic		7.2224(0.0)*	4.5752(0.00)*
Hausman Test		-	18 8035(0 00)*
N(n)		140(14)	140(14)
		()	

Table 3: GPMAG Unbalanced Panel Regression Results

Source: Authors computation (2019)

Table 3 above presents the two unbalanced panel data estimation results obtained when we estimated (the fixed effect and random effect versions of the GPMAG model. The results reveal that there are significant difference in the magnitude and signs of the coefficients of the two results. The results obtained for the fixed effect show that the R-squared and adjusted R-squared values are 0.51 and 0.45 respectively. This indicates that all the independent variables jointly explain about 45% of the systematic variations in performance as measured by the Net interest margin (GPMAG) across the quoted sampled banks in the sector under review in Nigeria over the sampled period (2006-2015). The explanatory power of the model can be seen as very strong based on the F-statistics (7.22247) and its p-value (0.0) showing that the GPMAG unbalanced panel fixed regression model is generally significant at 1% level. This implies that the variables in the model are strong determinants of performance as measured by Net interest margin amongst the quoted deposit money banks in Nigeria.

The result with respect to random effect technique shows that the R-squared and Adjusted R-squared values are 0.14 and 0.11 respectively. This indicates that all the independent variables jointly explain about 11% of the systematic variations in Net interest margin (GPMAG) across the quoted sampled firms in the sector under review in Nigeria over

the ten-year period (2006-2015). The explanatory power of the model can be seen as very strong too. The F-statistics (4.5752) and its p-value (0.0) show that the GPMAG model is generally significant at 1% level. This implies that the variables in the model are strong determinants of performance across the sampled firms over the reference period. In selecting from the two unbalanced panel data models, the Hausman test was conducted and the result shows a Chi-square and prob-value of (18.8035) and (0.00) respectively. This result implies that we should reject the null hypothesis (Ho) which assumes that random effect model is preferred to fixed effect model. This means that we should adopt the fixed effect panel regression results in the discussion of findings, policy formulation and recommendation(s). On this note, we analyze the full result of the fixed effect technique. Looking at the coefficients of the fixed effect results, the empirical evidence shows that interbank loans (INTBAKL) variable exerts a positive influence on Net interest margin GPMAG, though it failed the significance test. This means that though there is a positive relation between interbank loans and performance (Net interest margin) in the deposit money banks but the effect is not significant. It also implies that a unit change in interbank loans as a result of efficient management of investment opportunities will lead to about 0.02779 unit increase in performance as measured by the Net interest margin. This result suggests that we accept hypothesis one (Ho_1) which states that the effect of interbank loans on bank performance is not significant. In addition, the result also reveals the coefficient and p-value of interbank deposits (INTBAKD) variable as (-0.310) and (0.12) respectively. This implies a negative impact of interbank Deposits on performance as measured by Net interest margin (GPMAG) but in an insignificant manner. This outcome also implies that a unit change in interbank deposits due to efficient investment decisions of the selected banks has the tendency to lead to about 0.31 unit decrease in performance. This result suggests that we accept hypothesis two (Ho_2) which states that the effect of interbank deposits on performance is not significant.

The result with respect to capital adequacy (EQTTA) variable shows coefficient and pvalue of (0.4407) and (0.00) respectively. This means that capital adequacy exerts positively on performance as measured by Net interest margin (GPMAG). The variable also passed significance test at 1% level. This implies that a unit change in capital adequacy has the tendency bring about 0.4407 unit increase in performance in a highly significant manner. This also mean that capital adequacy is a strong driver of bank performance, so it a variable to watch out for in order to improve performance in the banking sector. Furthermore, the result with respect to asset tangibility (FASTA) variable, indicates a negative (-1.8229) impact on performance, but passed the significance test at 1% level. This means that there is a negative relation between asset tangibility and performance as measured by Net interest margin. Again, this is rather surprising, that as significant as asset tangibility seems to determine performance (that is, in terms of Net interest margin) the evidence prove contrary. It also implies that a unit change in asset tangibility will lead to about 1.8229 unit decrease in performance.

Looking at the effect of firm size (FSIZE) variable which is a control variable in the model, result indicates that firm size exert a negative and insignificant impact on performance in terms of Net interest margin. This means that the size of the firm does not necessarily influence performance of the deposit money banks. The result also show that the bigger the firm the more the tendency that its performance in terms of net of interbank loans and deposits will keep decreasing though in an insignificant manner.

The model overall is satisfactory given the significance level of 1% of the model as revealed by the prob (F-statistic) value. This justifies the goodness of fit of the model especially for policy formulation purposes.

CONCLUSION AND RECOMMENDATIONS

This paper has generally tried to appraise the interbank transactions of sampled banks vis-à-vis their performance as measured by various performance variables. Though, due to unavailability of some relevant data such as interbank transfers, we could not categorically make inferences upon overall interbank transactions in Nigeria. However, our findings that interbank transactions affect performance of quoted banks offer important implications for the assessment of profitability and returns on the asset of a bank from interbank lending, interbank deposit and otherwise.

The overall result appears impressive except for the unanticipated outcome of the relation between interbank deposits and performance as measured by net interest margin which show a negative relationship. It could be deduced from our outcome thus that most of the sampled banks were not duly partaking in most interbank transactions that has the tendency to generate high interests. It could also be a pointer to the fact that most of the banks partake in off-balance sheet transactions which cannot be accounted for among the data used for this study.

On this note, we believe that this paper forms yet a foundation for further research in this direction.

In the light of empirical evidences revealed by this paper, we deemed it fit to make the following subjections:

- 1. Banks in Nigeria should learn to trust their sister banks by giving adequate loan to them. And such loans should target high interest yielding options so as to guarantee returns.
- 2. The Central bank should have a way of enforcing compliance of its policies and regulations in this direction to know exactly the transactions that are accounting for bank performance.
- 3. In the light of the empirical evidence with respect to interbank deposit which still remains a big surprise coupled with
- 4. There should be policy directive to encourage interbank deposit such that should not be detrimental to the receiving bank. Also, the CBN should be very vigilant to ensure that these banks are operating within the legitimate bounds and ensuring the primary goal of money creation in the economy.
- 5. Further studies should try and incorporate pre and post consolidation data in this regard which we believe will be more revealing.

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