COMPETITION AND FINANCIAL STABILITY OF LISTED DEPOSIT MONEY BANKS IN NIGERIA

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ABSTRACT

The study examined the effect of competition on the financial stability of Deposit money banks listed on the Nigerian Exchange Group from 2010 to 2019. This results from consistent decreases in the number of listed banks since the consolidation of DMBs in 2005. The study used the Lerner index to measure competition, and Z-Score was used to measure the financial stability of the banks using the data gathered for the 10 years of the study using both descriptive and inferential statistics of the Random Effect Method. The study revealed that competition exists among banks in Nigeria and thus affects their financial stability. However, the study hence recommends that financial innovations should be encouraged by bank CEOs to enable them to compete among themselves effectively. In conclusion, this study also suggests that regulatory authorities be up to the task of monitoring the lending rate and policies of banks because too high-interest rates will increase default rates, which will thus affect the financial stability of Deposit money banks.

Keywords: Competition, Financial Stability, Deposit Money Banks, Lerner Index, Nigeria

INTRODUCTION

Over the last three decades, the Nigerian financial industry had witnessed a series of major experiences ranging from the merger and acquisition of commercial banks from a total of 89 banks to 25 banks in the year 2005 down to when there was a financial crunch globally, Nigeria inclusive, in the year 2007-2009, all these experiences affected the deposit money banks in Nigeria bringing down the number of banks in Nigeria. The consequence of these experiences led to a reduction in their numbers which has resulted in the concentration of banks, making it an oligopolistic market of service providers doing almost the same thing as a financial intermediary. After that, the reform in the financial industry initiated in 2005 in Nigeria brought about the anticipation that there would be enhancement in the banking system operations, which would

lead to a reduction in intermediation spreads and hence improvement in financial service access. However, the reverse is now the case. The financial stability of banks in Nigeria calls for serious concern as out of the consolidated 25 banks as of December 2005, only 13 remain. This indicates that competition might have reduced the number of banks, as many banks that cannot compete favourably have surrendered their ownership to healthier and capable banks.

According to the literature, competition in banking is pertinent to bring about efficiency in producing financial services, the financial product quality and the extension of financial innovations (Claessens & Leaven, 2004). However, competition to get customers has led many banks to reduce interest rates charged on loans. Similarly, competition among banks is expected to bring about financial stability. Financial stability is the ability of the bank to meet its contractual obligation when due without any interruption or assistance from outside, which will, in turn, bring about a high degree of confidence in the banking system. For this reason, banks are expected to identify financial innovations that will allow them to compete effectively to generate sustainable profits for their businesses. Research work on the effect of competition on financial stability has been carried out by several authors outside Nigeria (Xiaoquing et al., 2014; Agboraki et al., 2011; Clark et al., 2017; Sebastian et al., 2018; Nabiyev et al., 2016; Rakshit & Bardhan, 2020; Li, 2019a; Safitri et al., 2022)

However, empirical evidence in literature from Nigeria has shown that competition, as it affects the financial stability of deposit money banks, is still a grey area, in fact to the best of our knowledge, no researcher has worked on the impact of competition on the financial stability of banks here in Nigeria. The few researchers that have worked on competition have either tested for the level or degree of competition in Nigeria (Ajisafe & Akinlo,2013; Onanuga, Oshinloye & Onanuga, 2015; Asogwa, 2002); others that have worked on competition related it to other dependent variables like the performance of banks (Yahaya, Farouk, Yahaya, Yusuf & Dania 2015), the efficiency of banks (Ajisafe & Akinlo, 2014), economic growth of Nigeria (Ajisafe & Ajide, 2016), stock market and economic growth (Ajisafe & Ajide, 2018), market structure (Saibu, 2015); Hence this study.

However, several variables have been used to proxy competition in previous empirical studies in Nigeria; Ajisafe and Akinlo (2014) used the Intermediation ratio, Yahaya et al. (2015) used market share, profit margin, risk and loan, and lastly, Ajisafe and Ajide (2016), Ajisafe and Ajide (2018) used bank concentration ratio. In respect of this, this study is set to break ground by looking at the effect of competition among banks in Nigeria on their financial stability. This study will use Lerner Index (Claesson & leaven, 2004, Maudos and Fermandez de Guevara, 2004; Fermandez de Guevara et al., 2005; Berger et al., 2009; Mandos & Sotis, 2009) to measure competition.

LITERATURE REVIEW AND RESEARCH HYPOTHESES

As the argument and debate on whether a bank's financial stability is influenced by competition continues (Berger, Klapper and Turk-Aris 2009), literature has pointed out up to six reasons why competition is essential in the economy's financial sector. Becket al. (2004) said it allows firms and households to access efficient financial services; Secondly, it allows the financial sector to function properly (Claessen & Leaven, 2005); thirdly, Boyd et al. (2004) claimed that competition among banks ensures financial system stability; fourthly, Berger and Hannan (1989) identified that it gives room for proper and efficiency of financial intermediaries. In addition to

these, competition is said to allow the interbank market rate to improve the monetary policy transmission (Van Leuvenstijn et al., 2008) and lastly, competition among banks brings overall economic growth and industrial development (Allen & Gale, 2004)

The implication of competition on financial stability, i.e. performance, risk and profitability, have been broadly addressed in developed countries. However, no consensus result confirms the effect of competition among banks on bank stability, as empirical studies and theoretical models still need to be more conclusive and clear (Kasman & Carvallo, 2014). Among the researchers who argue that keen competition among banks will make them prudently obey rules which will lead to efficiency in the banking system to enhance financial stability are (Boyd and De Nicolo 2005, Beck, Demirgüç-Kunt, & Levine, 2006b; Schaeck et al., 2009; Schaeck & Cihak, 2014) while on the contrary, Keeley, (1990); Allen and Gale, (2004); Boyd et al., (2006); Agoraki, Delis and Pasiouras, (2011); Leroy and Lucotte, (2017), argued that competitions among banks negatively affect market power and profit margin, which will affect the franchise value of banks and competition makes them engage in a risky investment approach that might lead to the possibility of bank crises. OECD (2010) reported that the 2007 financial crisis brought about innovations in the banks' activities and also identified banks' funding structures as a potential source through which competition may affect banks' financial stability.

Competition-Stability Hypotheses

According to this hypothesis, competition has a significant positive effect on the bank's financial stability. Boyd and De Nicolo (2005) stated that banks that experience lower competition, i.e. those with greater market share in the loan market, can improve higher interest rates on their loans. In line with recent empirical and theoretical work, competition stability is premised on two arguments. The first one is the "too big to fail view" too big to fail view paradigm is based on the structure conduct performance paradigm. At the same time, the second one is the "risk shifting paradigm", which focuses on the loan market and argues that many studies conducted on financial stability considered only competition in the deposit market.

Under the "too big to fail paradigm, there exists a market structure where there are large numbers of financial institutions that can influence the financial authorities that would not want them to fail and, as a result, increase the incentives by taking too much risk for these 'few' banks. This is because those larger banks' failures might threaten the financial stability of the whole financial industry. Depositors also compound the effect of "too big to fail" as they fail to monitor their deposits with larger banks believing that in case of bank failure, their fund is protected by government insurance (Yeyati & Micco, 2007; Beck et al., 2006b)

The second argument on the competition-stability hypothesis is premised on the "risk shifting paradigm, " which focuses on the loan and deposit markets. This paradigm states that a financial institution that has gained enormous market power has tendencies to charge a higher interest rate, which the borrower may not be able to repay due to adverse selection problems or moral hazard. This will increase the number of loan defaults in banks' portfolios and destabilise the financial industry (Schaeck et al., 2009; Boyd et al., 2006; Boyd & De Nicolo, 2005). Many researchers in the area of accounting and finance that have empirically supported the competition stability view, which can also be referred to as concentration-fragility hypotheses, include Boyd et al. (2006), Schaeck and Cihak (2014), Caminal and Matute (2002), Beck, DeJonghe, Schepens (2013), Ibrahim et al., (2019), Goetz, (2018), Clark et al., (2017) Rakshit, (2020).

Competition-Fragility hypotheses

According to this hypothesis, also referred to as concentration stability, the increase in competition among banks will cause the financial institution to lose its market power, resulting in a decline in profit. In this situation, the banks are more likely to engage in a riskier investment to recover from financial losses. Furthermore, as a consequence, risk-taking will affect the stability of the involved banks (Allen & Gale, 2000**;** Hellman Murdock &Stiglitz, 2000; Keeley, 1990). Under competition-fragility, a trade-off exists between bank competition and financial stability, following the empirical result from work (Carletti & Hartmann, 2002; Beck, 2008).

In this framework, the financial institution's market power declines the bank's probability of failure and thus increases the banking system's stability. This view suggests that in an uncompetitive banking system where monopolistic banks operate, profits may be enhanced, and a reduction in the fragility of a financial system by maintaining a higher level of capital that will protect them from liquidity shocks and external economies. Banks enjoy higher profits with more market power. They also have more to lose if the uncalculated risk is taken.

In a nutshell, the competition-fragility hypothesis believes that bank competition will erode bank market power, decreasing the profit margin of banks and, as a result reducing the franchise value of the banks, which will create a motivation for the banks to take greater risks. Supporting this argument, Hellman *et al.* (2000) and Keeley (1990) propounded a "franchise value" hypothesis. This hypothesis states that the fragility of the banking system is increased by competition because it decreases the bank's profit margin and franchise value. In conclusion, competition will make banks struggle for borrowers to compensate for their lost profit margin and may give loans to ghost and inferior borrowers. This will lead to loan portfolio deterioration which will result in to increment in the bank's non-performing loan and, eventually, bank failure. Hence competition among banks causes the financial system to be feeble and fragile (Berger et al., 2009; Jimenez et al., 2007; Keeley, 1990; Phan et al., 2019)

METHODOLOGY

Secondary sources of data were used for this study. Data relevant to this study were extracted from the annual audited report of the selected banks for the period of (2010-2020) being a book that contains virtually all the variables under the study. In addition, the statistical bulletin of CBN, Securities and exchange reports, and Nigeria Exchange Group fact books covering the period of study were duly consulted to gather all those variables not captured by the banks' annual reports. This study employed a longitudinal research design. This is because this research involves repeated observations of the same variables (DMBs in Nigeria) throughout the study. The population of the study is the remaining 13 quoted DMBs in Nigeria as of 31 December 2021. A purposive sampling technique was employed for selecting the sample size of DMBs because of the availability of the variable of study in their financial statements, a large customer base, and a viable capital base as of December 2020. The 12 banks selected from the total population represent approximately 92.3% of the total population.

Model specification

In order to examine the effect of competition on banks' financial stability, bank-specific factors, macro-economic variables and business cycle variables are adopted from various studies

reviewed in the literature (Danisman & Demirel, 2019; Kasman & Kasman, 2015; Soedarmono, Machrouh, Tarazi 2013). The model used for this study to establish the competition-stability relationship is:

Financial stability = f(competition$_{it,}$ bank specific variables$_{it}$, macro-economic variables$_{it}$)....1

In model 1, subscript i & t refers to bank and time, respectively. The model explains the relationship between banks' financial stability and competition, in which bank-specific and macroeconomic variables will serve as the controlling variables.

In order to establish a further interaction between the variables, we will estimate the dynamic panel data model as follows:

$$financial\ stability_{it} = \alpha + \beta competition_{it} + \theta competition^2._{it} + \gamma bank\ specific\ variables_{it} + \delta macro\ economics\ variables_{kt} + \varepsilon_{it} \ ....2$$

Model 2 will further be broken down as stated in the model below.

$$z - score_{it} = \propto +\beta_1\ lerner_{it} + \beta_2 Elerner_{it} + \beta_3 banksize_{it} + \beta_4 capitalization_{it} + +\beta_5 GDP_{kt} + \beta_6 INF_{kt} + +\varepsilon_{it}..3$$

Where Z-score $_{it}$ will be used to measure bank financial stability for bank i in time t; the Lerner index for the bank will measure competition which is the main independent variable i at time t, where Lerner will be represented by bank-level indicator calculated as the difference that exists between the price and the marginal cost as a percentage of the price using fixed effect regression, the Elerner that will be used to measure Θcompetiton^2 is efficiency at bank-level, the adjusted indicator for competition that exists among banks calculated as the difference between price and marginal cost as a percentage of price adopting a stochastic frontier analysis approach. Bank-specific variables are bank size, which represents the log of total assets, and capitalization represents the ratio of bank capital to total assets. The macro variables are the vector of variables for the country k, including the logarithm of GDP growth, Inflation and lending rate.

Table 1: Measurement of Variable under Effect of Competition on Financial Stability

S/N	VARIABLES	DESCRIPTION/MEASUREMENT
1	Z-score	It measures the country's banking sector's probability of default. Z-score compares capitalization and returns with the volatility of those returns. A higher value represents less overall bank risk and high bank stability
2	Lerner index	It is the difference between output prices and marginal costs. Prices are calculated as total bank revenue over assets used to calculate prices, whereas marginal costs are calculated from a translog cost function to output costs. A higher value indicates low bank competition.
3	E-LERNER	A bank-level non-structural indicator of bank competition is measured by the efficiency-adjusted Lerner index using a stochastic frontier analysis approach. Higher values indicate low competition among banks.
4	SIZE	Bank size is measured as the natural logarithm of total assets in

		millions of Naira
5	Capitalization	The ratio of Bank Capital to total assets
6	GDP growth (real)	The rate of growth of the gross domestic product
7	Inflation	Annual CPI rate

Source: *Researcher's Compilation, 2022*

RESULTS AND DISCUSSION

Table 2: Descriptive Statistics

	Mean	Med.	Max.	Min.	Std. D	Skew.	Kurt.	JB	P(JB)	Obs
FS	0.123	0.030	1.612	-1.345	0.311	1.142	2.677	31.564	0.000	120
LERNER	0.155	0.226	0.977	0.063	0.154	5.171	29.342	4142.31	0.000	120
ELERNER	0.513	0.341	7.324	0.643	8.042	6.071	62.851	19603.16	0.000	120
LNASSET	19.502	19.654	24.441	17.341	1.022	-0.341	2.123	2.071	0.123	120
CAPITAL	0.144	0.154	0.789	-1.043	0.320	-0.768	17.231	15.534	0.000	120
GDP	0.039	0.064	0.213	-0.015	0.043	-0.131	2.449	1.273	0.454	120
RINTR	6.261	5.685	17.380	-4.543	1.731	-0.165	2.412	3.173	0.111	120

Source: *Researcher's Compilation, 2022*

The descriptive statistics result, as reported in Table 1, captures the exploratory characteristics of the variables. The result reports the mean, median, minimum, maximum, standard deviation, skewness, kurtosis, and Jarque Bera. It was discovered that the financial stability variable is clustered around its means. The variable report an average of 0.123 and a standard deviation of 0.311. It exhibits non-normality with a JB value of 31.564 and a p-value less than 0.05. The variable Lerner also reports an average of 0.155 and a standard deviation of 0.154. It shows that the data points are relatively far from each other. LNASSET exhibited the lowest degree of disparity among the firms; the mean is 19.502, while the standard deviation is 0.320. Similarly, GDP reports a low degree of disparity within the sample period. Also, the real interest rate reports a low degree of disparity, with a mean value of 6.261 and a standard deviation of 1.731. CAPITAL reported a mean of 0.144. The standard deviation is 0.320. FS, LERNER, ELERNER, and CAPITAL exhibited non-normality at 5% significance. LNASSET, GDP and RINTR report normality with a p-value greater than 0.05. FS, LERNER & ELERNER report positive skewness.

Table 3:   **Pairwise correlations**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) fs	1.000						
(2) lnasset	0.067	1.000					
(3) capital	0.134	0.136	1.000				
(4) gdp	0.050	0.165	0.089	1.000			
(5) rintr	-0.133	-0.040	0.043	0.156	1.000		
(6) lerner	-0.078	-0.343	-0.156	-0.258	0.153	1.000	
(7) elerner	0.050	-0.078	0.077	-0.047	-0.031	0.161	1.000

Source: *Researcher's Compilation, 2022*

Correlation Matrix

The correlation results in Table 3 show that the independent variables have a weak correlation. For example, the ACL of the banks had a weak correlation with LNASSET; LERNER and LNASSET also reported a weak correlation coefficient. Also, LNASSET had a weak statistically significant correlation with ELERNER. Other variables used in the model do not exhibit a significant correlation with other explanatory variables. From the correlation table, it was evident that multicollinearity exists less among the variables.

Table 4: Panel Unit Root

	Levin, Lin & Chu t*		Im, Pesaran and Shin W-stat		Remarks
	statistics	P-value	statistics	P-value	Stationary at level
An asset	-12.6543	0.0000	-7.4172	0.0000	Stationary at level
Lerner	-7.4842	0.0000	-6.5543	0.0000	Stationary at level
elerner	-3.5065	0.0000	-1.6552	0.0043	Stationary at level
GDP	-8.6675	0.0000	-6.4332	0.0000	Stationary at level
CAPITA	-11.7866	0.0000	-7.4698	0.0000	Stationary at level
RINGER	-6.7674	0.0000	-6.7732	0.0000	Stationary at level
FS	-10.5880	0.0000	-6.7602	0.0000	Stationary at level

Source: *Researcher's Compilation, 2022*

Panel Unit Root

Panel unit root test was carried out using the Levin, Lin & Chu t* and I am, Pesaran and Shin W-stat by assuming common unit root or individual unit root. The result is presented in Table 4. The result shows that all the variables were stationary at the level. Hence, the study can estimate the model coefficient using the panel least square method.

Multicollinearity Test

Table 5: Variance Inflation Factor

Variable	VIF	1/VIF
An asset	1.410	0.709
Lerner	1.220	0.820
Elerner	1.170	0.855
GDP	1.340	0.746
CAPITA	1.190	0.840
RINTR	1.250	0.826
Mean VIF	1.263	

Source: *Researcher's Compilation, 2022*

According to the literature, a variable that is free from multicollinearity will have VIF that is less than 10. Hence all the variables under study are free from the problem of multicollinearity

Serial Correlation and Heteroskedasticity Test

Table 6: Diagnostic Test

Test	Test Statistics	P-value
Wald test for GroupWise heteroskedasticity	5.22	0.6779
Wooldridge test for autocorrelation in panel data	2.030	0.1708

Source: *Researcher's Compilation, 2022*

In order to ascertain the robustness of the model estimate, the Wald test for GroupWise heteroscedasticity and the Wooldridge test for autocorrelation in panel data were carried out. The results of the two tests are presented in Table 6. The null hypothesis is that the model is free from serial correlation and heteroscedasticity; however, when the null hypothesis is accepted, that implies that the model residual exhibit serial correlation and heteroscedasticity. However, the Wooldridge test for autocorrelation in panel data with test statistics of 2.032 and a p-value of 0.1708 reports that the model is a free serial correlation. Similarly, the Wald test for GroupWise heteroscedasticity indicates that the model is free from heteroscedasticity with a p-value of 0.6779. The result shows that the null hypothesis of the two tests was rejected.

Table 7: **Regression Estimate of the effect of income diversification on the financial stability of DMBs in Nigeria**

	Random Effect Model			Fixed Effect Model			Pooled OLS		
	Coeff.	t-value	prob	Coeff.	t-value	prob	Coeff.	t-value	prob
C	-0.6159	-2.0127*	0.0362	-0.6953	-1.0371*	0.0308	-0.7001	-1.0003	0.2124
CAPITAL	0.2340	1.2431*	0.0015	0.2672	1.5242*	0.0009	0.0773	2.7623*	0.0051
GDP	0.2371	0.2649	0.7065	0.1555	0.1572	0.6330	2.6956	0.1123	0.5774
LNASSET	0.0654	2.6176*	0.0045	0.0361	2.5563*	0.0075	0.2261	1.1476	0.2146
RINTR	-0.0007	0.0395	0.9237	0.0006	0.1027	0.8149	1.7432	0.2105	0.7121
LERNER	-0.0007	2.7031*	0.0095	0.0006	0.7697	0.3875	-0.2239	0.8942	0.1186
E LERNER	-0.0026	0.8156*	0.0042	-0.0050	-0.8730	0.3394	-0.1401	-0.7590	0.5505
R-squared	0.5185			0.5621			0.4295		
Adjusted R-squared	0.4552			0.4052			0.3036		
F-statistic	25.5294			10.9546			1.5519		
Prob(F-statistic)	0.0000			0.0000			0.0860		
Hausman Test	2.3704, p=0.9642								
Lagrange Multiplier Test	16.352 P=(0.0000)								

significant at 5% level. **Source:** *Researcher's Compilation, 2022*

DISCUSSION OF RESULTS

This section reports the result of the effect of competition on the financial stability of DMBs in Nigeria. The study conducted the Lagrange Multiplier Test to determine if random effect and pooled OLS are similar. The test's null hypothesis is that there is no significant effect in the model. The test result revealed that significant effects exist in the model specification. This implies that random effect is better than pooled OLS in capturing the relationship between the dependent and independent variables. The study also conducted the Hausman test apart from Lagrange Multiplier Test to ascertain the significant difference between random and fixed effects. The random effect was selected as the appropriate model for the test.

The random effect model's result, as displayed in Table 7, shows that the banks' capital positively affected financial stability. This means that if banks have sufficient capital to finance their activities, this will generate more income that will, thus, increase financial stability. This result is in line with Zheng et al., (2017); Laeven and Levine, (2009). In the same vein, LNASSET, which is used to measure firm size, had a statistically positive and significant relationship with the financial stability of the banks. (Coef =0.2340, t-value = 1.2431 and prob=0.0015) The result means that if banks have a strong asset base, they will be financially stable. In addition, firms with large sizes of assets have a higher chance of investing in other

businesses because they have sufficient resources to fund diversification, and this can thus lead to the stability of firms (Bowen & Wiersema, 2005). The result is supported by the study of (Tabak et al., 2012).

The LERNER, used to proxy competition, enhances financial stability with a coefficient of - 0.007 and is highly negatively significant with a t-value of 2.7031. The result supported the apriori expectation of a negative sign at the 5% significance level, this suggests that where there is an increase in the degree of pricing power of banks, there will be an increase in the individual stability of banks in Nigeria. This result is consistent with the competition-stability hypothesis (Caminal & Matute, 2002). The ELERNER also report a negative relationship with the financial stability of the banks with a coefficient of -0.0026. It thus decreases the bank's financial stability with a t-value of 0.8156. However, GDP growth shows that, with the increase of the gross domestic product, there is an increase in the bank's financial stability. This implies that when there is growth in the gross domestic product of a nation, there will also be an increase in financial stability. In addition, economic growth will increase the investment drive, and funds will be available for feasible projects. In summary, when there is a stable and improved economy, business owners that have borrowed money to fund their business will have a conducive environment to do their business, leading to their ability to repay the loan as and when due. However, This result is not in support of the reports of (Clark et al., 2017; Rakshit, 2020; Boyd, 2006)

The regression results show that lower interest rates positively affect bank financial stability. This supports the findings of Beck et al. (2009), who find a significant negative correlation between the interest rate and a bank's financial stability. The r-squared of the model reports that the independent variables accounted for 51.85% of the variation in financial stability. The f-statistics show that the model is statistically significant, with f-statistics of 25.52 and a p-value less than 0.05.

CONCLUSION AND RECOMMENDATIONS

This study examined how competition affects the stability of banks in Nigeria for the period of 2010 -2020. Bank-level Competition indicators Lerner and Elerner were used to measure competition in the model. The results highlight the negative relationship between the Lerner index and individual bank risk in Nigerian deposit money banks. The study's result must be consistent with the postulation of Boyd and De Nicolo 2005. competition stability hypothesis. Hence, competition and financial stability cannot exist in the financial industry. However, the result of our study holds when we control for capital, bank size, real interest rate and GDP. Competition among banks makes the industry ineffective and efficient. Our finding on the link between competition and financial stability shows that competition is negatively associated with the financial stability of DMBs in Nigeria.

The study recommends that financial innovation be encouraged among deposit money banks in Nigeria based on how they can effectively manage their risk. This will enable them to become more financially stable. Moreover, less stringent scrutiny must be carried out when there is a request for entry into the financial industry of the economy. This will reduce the incidence of banks that may want to be dominating the sector by considering themselves as 'too big to fail'. Furthermore, the study recommends that regulatory authorities should monitor the lending rate

and policies of each DMB so that the debtors should be able to pay back the loan as and when due because when the lending rate is too high, the default rate will be high and the end result will be financial instability in the whole economy.

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