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BANK COMPETITION AND FINANCIAL STABILITY IN NIGERIA

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ABSTRACT

Introduction: The study examined the impact of bank competition on the financial stability of selected deposit money banks in Nigeria. The study employed panel data (secondary data) that was collected from 2019 to 2023 (both years inclusive).

Methods: The panel regression analysis was employed to determine the relationship between the outcome variables and explanatory variable, taking decisions from the Huasman test.

Results The findings of the study from objective one revealed that the Herfindahl-Hirchman loan Index has a positive significant effect on capital adequacy ratio along with diversification ratio and bank size, which are control variables. It also has a negative significant effect on capital adequacy ratio. Objective two revealed that the Herfindahl-Hirchman Deposit Index diversification ratio and bank size have a positive significant effect on non-performing loans in Nigeria.

Conclusion and suggestion: Based on the findings, it therefore recommended that deposit money banks should diversify their loan portfolio across sectors and customer types to mitigate a concentration risk in the deposit money banks. Reallocating capital from less diversified or larger loans to smaller, more diversified segments of the portfolio would spur the level of competition accuracy of the banks.

INTRODUCTION

The Global Financial Crisis (GFC) awakened all the financial agents to deepen efforts towards preserving and ensuring the safety, soundness and stability of the financial system. The crisis caused an obvious financial disruption on the kind of financial services rendered by banks to their prospective customers (Egboro, 2016; Rahman et al., 2021). The deposit money banks from that crisis have been able to move from operating like profit oriented institutions to operating as intermediation oriented institutions, knowing

full well that their innovative disruption and dexterity facilitated by the financial crisis would aid to solidify the operations of the financial markets and system (Klingelhöfer and Sun, 2019).

The nexus between competition and financial stability was triggered by the seminal article of Keeley (1999) that dipped into the controversies of either competition-fragility or competition stability. The latter posits that competition will induce deposit money banks, in the case of Nigeria's economy, to take excessive risk to increase their return outside their intermediation function. The former posits that the lack of competition among the deposit money banks will induce financial instability because the banks with higher market share/power will monopolize the market to their gains. Various studies like Bamigboye et al. (2022), Akbar et al. (2023), Abuselidze (2021), Banyen (2021), Amadi et al. (2021), Olalere et al. (2021), Rahman et al. (2021), and Ijaz et al. (2020) still show the benefits or black house attribute of competition in alluring financial stability and inducing financial fragility in Nigerian banking to be inconclusive. Given Nigeria's over-reliance on this sector to drive development over all others, examining the inter-relationships among firms within it is crucial. This analysis will reveal whether these interactions genuinely foster development or, conversely, hinder growth and financial stability in the country. Empirical works on the validation of the theory in the Nigerian context still remain scant.

Deposit money banks are economic propellants when they operate in a good investment-savings focused economy. However, this investment-savings environment is contested by the same similar banks, who are operating at the expense of each 'for scare' deposit and through the processes expected to improve the financial development and growth of the economy. However, vibrancy, economic growth, and the development of a country depend on the effective and efficient flow of funds from the surplus sectors to the deficit sectors of the economy, which occurs via the intermediation prowess of commercial banks in that economy (Rahman et al., 2021). Financial stability in any economy is the ability to reduce or curb financial risk and economic shock through accurate investment in a real asset that will generate a return on time-bound investment (World Bank, 2018). The aftermath of financial instability is the continuous increase in non-performing loans in the balance sheet of deposit money banks, which in the long run hinders deposit money banks when they perform their intermediation function and stifles investment and economic growth in the economy (Rahman et al., 2021).

The banking industry serves as a major conduit through which instability may be transmitted to other sectors of the economy by disrupting the interbank lending market and payments mechanism, reducing credit availability, and by freezing deposits. The fear that increased competition may add to financial system fragility has traditionally motivated regulators to focus on developing policies that preserve stability in the banking

sector, knowing full well that the nexus of competition and financial stability has remained a widely debated and controversial issue among policymakers, academicians, and regulatory bodies. Therefore, a continuous increase in non-performing loans of the monetary authorities will damage the monetary transmission mechanism and ability of deposit money banks to create wealth in the internal and external economy of the country (Shijaku, 2017). The competition will enhance the quality and efficiency of services and in turn improve the financial stability of the country (Fiordelisi and Mare, 2014; Roman and Sargu, 2013), while on the other hand competition is also seen as a lacuna that affects the soundness of the banking sector (OECD, 2010).

Rakshit and Badhan (2020) illustrated that for banks to improve the state of capital adequacy and capitalization in their internal operations, they have to maintain market power to control the rate in which the long run should improve the financial stability of the economy (Noman et al., 2017). Thus, this enquiry intends to validate through two theoretical postulations and examine if the measures of bank competition in the Nigerian context actually influence the level of financial stability in the economy. Importantly, in a country like Nigeria, the level of liberalization in the banking sector has allowed for an increase in competition for market share and deposits that will be transformed for investment purposes. This study examined the impact of bank competition on the financial stability of deposit money banks in Nigeria.

LITERATURE REVIEW

Competition-Stability Theory

The theory states that banks with greater market power have higher bank risk due to the higher interest rates charged to loan customers which would increase loan portfolio risk and intensify moral hazard and adverse selection problems. Monopolistic banks charge higher loan rates, which may induce borrowers to take on risky investments resulting in the potential increase of loan defaults and causing a higher probability of bank failure (Boyd & De Nicoló, 2005). Furthermore, larger banks are often more likely to have deposit insurance and the government's safety net so that they are inefficiently managed and more likely to fail. With the protection provided by public guarantees, large bank managers may take on risky investments. Mishkin (1999) suggests the so-called 'too-big-to-fail' concept and argues that, along with the size of banks, the moral hazard problem becomes more severe. The competition-stability hypothesis is supported by empirical evidence from the banks in the U.S. (De Nicolo, Jalal, and Boyd, 2006), Europe (Jankovská, 2014; Kasman and Kasman, 2015) and 55 emerging and developing countries (Amidu & Wolfe, 2013). In summary, the less competition, the more risk.

Competition-Fragility Theory

The theory illustrates that banks with greater market power also have less overall risk exposure. More competition erodes banks' market power, reduces profitability, and causes decreased franchise value and induces banks' risk-taking (Berger, Klapper, and Turk-Ariss, 2009). The charter value hypothesis (Keeley, 1990) or franchise value hypothesis provides banks with a valuable source of monopoly power (Hellmann, Murdock, and Stiglitz, 2000). Higher franchise value is expected to reduce risk-taking incentives and increase capital due to growing opportunity costs when bankruptcy occurs. In other words, the less competition, the less risk. Banks in the U.S. with high charter value operate more safely when holding more capital and taking on less portfolio risk, which is feasible mainly through diversifying lending activities (Demsetz, Saidenberg, and Strahan, 1996). Studying data on 69 countries from 1980 to 1997, Beck et al. (2006) find that crises are less likely in economies with more market concentration in banking systems. The competition-fragility theory is also supported by empirical evidence from Spain (Saurina Salas, Jiménez, and Lopez, 2007) and Latin American countries (Yeyati and Micco, 2007). Furthermore, an increase in competition will have a larger impact on banks' fragility in countries with stricter activity restrictions, lower systemic fragility, more generous deposit insurance better-developed stock exchanges, and more effective systems of credit information sharing (Beck et al., 2013).

Empirical Review

Akbar, Rehman, and Arshad (2023) investigate the interplay among competition, political risk, and bank stability, particularly emphasizing their significance at the national level amidst ongoing political and regional uncertainties. The study focuses on five countries—China, Pakistan, India, Bangladesh, and Sri Lanka—over a span of seven years (2011-2017), utilizing data sourced from World Bank indicators. Their findings highlight a substantial impact of competition and political risk on banking sector stability. Notably, the relationship between competitiveness and financial stability is moderated by economic growth, while economic development plays a moderating role in the connection between political risk and banking stability. The study aims to aid banking sectors in integrating competitive and political risk considerations into their risk management frameworks, thereby contributing to enhanced market resilience. Furthermore, the research is poised to enrich future studies by facilitating the incorporation of a broader spectrum of characteristics.

Bamigboye, Akinrinola, and Erin (2022) investigated the impact of competition on the financial stability of Deposit Money Banks (DMBs) listed on the Nigerian Exchange Group during the period spanning from 2010 to 2019. The examination stemmed from the consistent reduction in the count of listed banks, subsequent to the consolidation of DMBs in 2005. Utilizing the Lerner index to gauge competition and the Z-Score to assess financial

stability, the study analyzed data collected over the aforementioned 10-year period, employing descriptive and inferential statistics through the Random Effect Method. Findings indicated the presence of competition among Nigerian banks, thereby influencing their financial stability. Consequently, the study advocates for the promotion of financial innovations by bank executives to foster effective competition. Additionally, regulatory authorities are advised to vigilantly monitor banks' lending rates and policies, as excessive interest rates may elevate default rates and adversely affect the financial stability of DMBs.

Abuselidze (2021) examines the level of competition in the banking market using different econometric models and analyzes the impact of efficiency of the banking system on the economic growth of the country. The study was able to identify the concentration index, index Linda, and Lerner index, which are the three measures of bank competition and their related impacts on economic growth. The study was also able to reveal a conceptual relationship between economic growth, bank competition and banking stability in Georgia. The study was able to depict that the existence of high-level banking competition and low concentration in the banking market balances the speed of money supply in the economic sector. The study research technique was the comparison of the various bank competition measures in respect to listed banks in the economy. The study also performed a structural methodology to determine the level of relationship. The findings of the enquiry revealed that the increase in the level of bank stability will increase the quality of competition to spur economic growth.

Banyen (2021) investigated the shifts in the financial freedom and competition on bank risk- taking behavior using data from 405 banks in 47 African countries across five regional economic communities from 2007-2014. The study was able to lucidly depict the influence of financial integration and bank competition on the risk-taking behavior of banks, knowing fully well that their risk-taking adventure would improve their profit/deposit which in the long-run would have positive intermediation impact on the deficit sector of the economy. The study was able to determine direct effect and indirect effect of bank competition on the risk-taking behavior of the banks. The panel regression analysis was employed for the study, drawing data from the financial statements of 407 banks used across the region. The findings depicted that financial integration directly increases bank risk-taking behavior in Africa. The study did not use any theory.

Amadi et al. (2021) examined the relationship between banking system stability and financing sustainable development goals in emerging economies, especially Nigeria. The study was able to determine where and how to access fund that would allow and enhance banks towards the successful achievement of SDGs in Nigeria. It looked at the stability and risk taking/intermediation capacity of funding SDGs in Nigeria. The study

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lacked a theoretical framework and no control variable was employed in models; it only carried the dependent and independent variables alone. However, the work was lucid in terms of methodology, problem and analysis (Econometrics).

Olalere et al. (2021) examined the effects of financial innovation and bank competition on firm value. They investigated the impact of financial innovation on the firm value of banks in Nigeria and Malaysia. The study was able to push a notion of relevance of financial innovation which would induce competition fragility among banks that in the long run would improve firm value of the competing banks in the countries. The study examined the concept in a combined model and an individual model. The findings depict that financial innovation has a significant negative effect on firm value in Nigeria, and bank competition has a significant negative effect on firm value in Nigeria. By contrast, financial innovation has a significant positive effect on firm value in Malaysia, and bank competition has a significant positive effect on firm value in Malaysia. The return on asset, bank size, GDP growth, and inflation rate are significantly related to firm value. The interactive effect of financial innovation and competition has a significant positive relationship with firm value in Nigeria and Malaysia.

Rahman, Chowdhury, and Tania (2021) examined the impact of bank competition and efficiency in the financial stability of the banking sector in Bangladesh. The study used the Lerner index and the Boone indicator to represent the bank competition, while the non-performing loan (NPL) and Z-score were used to represent financial stability. The secondary data were collected from the annual reports of 28 DSE listed commercial banks in Bangladesh over the period 2011 to 2018. Using a dynamic panel GMM model, the study found the Lerner index is significantly negatively related with Z-score, which means that higher bank competition results in higher bank stability. It is also seen that higher cost efficiency results in higher bank stability. The Lerner index was negative but had an insignificant impact on NPL. Similarly, using the Boone indicator, this study found that lower competition increases NPL. In terms of the Z-score, the Boone indicator found that 1 unit of increment results in a decrease of the Z-score by 6.15 units. The study suggests that, as more competition results in more financial soundness, the banking industry competition should be ensured by policymakers or regulators. Banks could enhance financial stability by cost control to achieve cost efficiency as well as by improving loan-to-asset ratio.

Ijaz et al. (2020) examines the effect of bank competition and financial stability on economic growth. The study was able to examine the inter-relationship of bank competition and financial stability on the long-run effect on economic growth, looking at the operational activities of the deposit money bank on economic growth. The Generalized Moment Method regression analysis was employed for the study. The Boone

indicator was employed to capture bank competition while bank stability, the Z-score and the non-performing loan were used to capture the independent variable.

Rakshit and Bardhan (2020) examined the impact of bank competition on financial stability in India. The dynamic panel model was used to examine whether an increase in bank competition hindered the financial stability of commercial banks in India over the period 1996 to 2016. The study reveals that in India, a higher degree of bank competition was positively associated with the prevalence of non-performing loans. Additionally, the positive impact of the Lerner index on the Z-score lends support to competition-fragility hypothesis. However, we argue that both the views of competition-stability and competition-fragility can coexist in a single banking system like India.

Xia, Lei, and Liang (2019) examined the relationship between bank competition, efficiency and stability in Macau. The bank competition was measured using the Lerner Index and Bank stability using the Z-score. The Granger Causality and Regression analysis was employed. The findings depicted a positive but non-significant connection between bank market power and bank fragility, including income volatility and insolvency risk. Moreover, this study found no evidence that the size of operations proxied by total bank loans and total assets would impact bank efficiency, indicating that economies of scale or bank market share do not necessarily bring about efficiency in Macau. The study lacks a theoretical framework and methodology. The selection of the banks was not systematic in nature.

Shijaku (2017) examined bank stability and competition using evidence from the Albanian Banking Market. The study examined the inter-temporal completion-stability nexus after the global financial crisis using some unique measurement aids. The measurements included Bank stability (New Composite Index) and Competition (Lerner Index, the efficient adjusted Lerner Index and Herfindahl Index). The Generalized Moment Method was employed for the study. The study should have included control variables in the models and it lacked an anchoring theory.

RESEARCH METHODS

The research employed secondary data from the period of 2019-2023, sourced from the financial statements of the following fifteen deposit money banks in Nigeria: Zenith bank, First bank of Nigeria, Access bank, United bank of Africa, Guaranty trust bank, Fidelity trust bank, Stanbic IBTC bank, Union bank, Wema bank, FCMB, Unity bank, Polaris bank, Ecobank, Sterling bank and Globus bank. The descriptive and inferential statistics are depended upon to examine the impact of bank competition on financial stability of deposit money banks in Nigeria.

Model Specification

This model was adopted and adjusted to suit the present study from the works of Agostino and Trivieri (2010), Abuselidze (2021) and Dutta and Saha (2021).

Model One

$$CAR_{i,t} = \left(\alpha_0 + \beta_1 HHDI_{i,t} + \beta_2 BS_{i,t} + \beta_3 DIV_{i,t} + \beta_4 BS_{i,t} + \mu_t\right) \quad (1)$$

Model Two

$$NPLR_{i,t} = \left(\alpha_0 + \beta_1 HHDI_{i,t} + \beta_2 BS_{i,t} + \beta_3 DIV_{i,t} + \beta_4 BS_{i,t} + \mu_t\right) \quad (2)$$

Where

CAR : Capital adequacy ratio at time t
NPLR : Non-performing loan ratio at tie t
HHDI : Herfindahl-Hirchman Deposit Index at time t
HHLI : Herfindahl-Hirchman Loan Index at time t
BS : Bank Size at time t
DIV : Diversification at time t
U : Disturbance term/White noise at time t
I : nth term
α : Intercept
α1– α6 : Coefficient of the Independent Variables.

Table 1. Description of Variables

Variables	Acronyms	Description	Measurement
		Dependent Variable	
Non-performing loan ratio	NPLR	Is a key financial metric used to assess the health of a bank's loan portfolio.	Is measured by dividing the total amount of non-performing loans by the total amount of loans outstanding (Rakshit and Bardhan, 2020)
Capital adequacy ratio	CAP	It is a standard for banks set by looking at a bank's ability to pay liabilities and respond to credit risks and operational risks.	It is measured by the bank's available capital expressed as a percentage of a bank's risk weighted credit.
		Independent Variable	
Herfindahl-Hirchman Deposit Index	HHDI	It is a bank market concentration index in term of deposit level/ratio	It will be measured by deposit of bank i, divided by total deposit of the selected bank in sample size within the period. The total will then be squared (Agostino, Gagliardi, and Trivieri, 2012).

Herfindahl-Hirchman Loan Index	HHLI	It is a bank market concentration index in term of loan level/ratio	It will be measured by the loan of bank i divided by total loan of the selected bank in the sample size within the period. The total will then be squared (Agostino, Gagliardi, and Trivieri, 2012).
		Control Variables	
Diversification	DIV	It is the level of non-interest operating income to total revenue.	It is measured by dividing the operating income by total bank revenue or profit.
Bank Size	BS	It is the annual improvement in the total asset of the commercial banks	It is measured by the logarithm value of the total asset.

Source: Author's Compilation, 2024

RESULT AND ANALYSIS

This section captures the analysis and empirical findings discussion. This entails the descriptive statistics, correlation matrix, Chow test, Hausman test, Langrage Test, the pooled effect, fixed effect and random effect model.

Table 2. Descriptive Statistics

	CAR	NPLR	HHLI	HHDI	DIV
Mean	0.804960	0.130676	0.001035	0.001078	0.870432
Median	0.844561	0.040144	8.683409	1.032208	0.872256
Maximum	0.952074	2.348012	0.022792	0.026963	1.264518
Minimum	0.040460	0.000000	4.525411	6.190011	0.506655
Std. Dev.	0.166689	0.431647	0.003454	0.003846	0.135856
Skewness	-3.131395	4.682851	4.656124	5.103272	-0.002775
Kurtosis	13.50840	23.16369	26.20691	31.36037	4.465890
Jarque-Bera	467.6529	1544.658	1953.996	2839.013	6.715197
Probability	0.000000	0.000000	0.000000	0.000000	0.034819
Sum	60.37200	9.800703	0.077606	0.080832	65.28236
Sum Sq. Dev.	2.056114	13.78759	0.000883	0.001095	1.365816
Observations	75	75	75	75	75

Source: Author's Compilation, 2024

The table above describes the variables in terms of their measure of central tendency (Mean), measure of dispersion (Standard deviation, Range [Minimum and Maximum]), and measure of normality (Kurtosis, Skewness and Jarque-Bera Probability).

The mean (average) of CAR (Capital adequacy ratio) has a mean value of 0.80, NPLR (Non-performing loan ratio) has a mean value of 0.13, HHLI (Herfindahl-Hirchman Loan Index) has a mean value of 0.00, HHDI (Herfindahl-Hirchman Deposit Index) has a mean

value of 0.00 and DIV (Diversification ratio) has a mean value of 0.87. BS (Board size) has a mean value of 7.50. CAR (Capital adequacy ratio) has a minimum value of 0.04 and maximum value of 0.95, NPLR (Non-performing loan ratio) has a minimum value of 0.00 and maximum value of 2.34, HHLI (Herfindahl-Hirchman Loan Index) has a minimum value of 4.52 and maximum value of 0.02, HHDI (Herfindahl-Hirchman Deposit Index) has a minimum value of 6.19 and maximum value of 0.02, Div (Diversification ratio) has a minimum value of 0.50 and maximum value of 1.26 and BS (Bank size) has minimum value of 6.03 and maximum value of 10.06. The Skewness captures the degree of asymmetry of the series. CAR (Capital adequacy ratio) has a short right tail which is negatively skewed at -3.13, indicating it has a lower value than the sample mean. NPLR (Non-performing loan ratio) has a long right tail which is positively skewed at 4.68, indicating it has a higher value than the sample mean. HHLI (Herfindahl-Hirchman Loan Index) has a long right tail positively skewed at 4.65, indicating it has a higher value than the sample mean. HHDI (Herfindahl-Hirchman Deposit Index) has a long right tail positively skewed at 5.10, indicating it has a higher value than the sample mean. DIV (Diversification ratio) has a short right tail negatively skewed at -0.002, indicating it has a lower value than the sample mean. BS (Bank size) has a long right tail positively skewed at 0.54, indicating it has a higher value than the sample mean. The Kurtosis captures the flatness of the distribution in the series. CAR (Capital adequacy ratio) is leptokurtic (value greater than 3) at 13.5 (peaked curve, higher value for the same mean). NPLR (Non-performing loan ratio) is leptokurtic (value greater than 3) at 23.16 (peaked curve, higher value for the same mean). HHLI (Herfindahl-Hirchman Loan Index) is leptokurtic (value greater than 3) at 26.20 (peaked curve, higher value for the same mean). HHDI (Herfindahl-Hirchman Deposit Index) is leptokurtic (value greater than 3) at 31.36 (peaked curve, higher value for the same mean). DIV (Diversification ratio) is leptokurtic (value greater than 3) at 4.46 (peaked curve, higher value for the same mean). BS (Bank Size) is platykurtic (value less than 3) at 1.77 (curve, lower value for the same mean).

The Jarque-Bera Statistics are as follows: CAR (Capital adequacy ratio) is 467.65 at 0.00, indicating that the variables are not normally distributed. NPLR (Non-performing loan ratio) is 1544.6 at 0.00, indicating that the variables are not normally distributed. HHLI (Herfindahl-Hirchman Loan Index) is 1953.9 at 0.000, indicating that the variables are not normally distributed. HHDI (Herfindahl-Hirchman Deposit Index) is 2839.0 at 0.00, indicating that the variables are not normally distributed. DIV (Diversification ratio) is 6.7151 at 0.00, indicating that the variables are not normally distributed. BS (Bank Size) is 8.39 at 0.01, indicating that the variables are not normally distributed.

Table 3. Correlation Matrix

	CAR	NPLR	HHDI	HHLI	DIV	BS
CAR	1					
NPLR	-0.8128	1				
HHDI	0.1150	-0.0567	1			
HHLI	0.1208	-0.0603	0.9907	1		
DIV	-0.2649	0.1517	-0.0070	-0.0136	1	
BS	-0.0711	-0.0065	0.5029	0.5323	-0.1233	1

Source: Author's Compilation, 2024

CAR (Capital adequacy) has positive relationship with HHLI (Herfindahl-Hirchman Loan Index) and HHDI (Herfindahl-Hirchman Deposit Index) at 0.12 and 0.11, with a negative relationship with DIV (Diversification ratio) at -0.26 and BS (Bank size) at -0.07. NPLR (Non-performing loan ratio) has a positive relationship with DIV (Diversification ratio) at 0.15 and negative relationship with HHDI (Herfindahl-Hirchman Deposit Index) at -0.05, HHLI (Herfindahl-Hirchman Loan Index) at -0.06, and BS (Bank Size) at -0.00.

Table 4. Regression Analysis Model 1

Dependent variable: Capital Adequacy ratio

Variable	Pooled	Fixed	Random
C	1.3391	-2.6824	1.3391
	(0.000)	(0.0000)	(0.0000)
HHDI	-21.2670	-5.6851	-12.2679
	(0.5624)	(0.8467)	(0.5538)
HHLI	35.5922	-2.3595	35.5922
	(0.3943)	(0.9515)	(0.0840)***
DIV	-0.3552	-0.0541	-0.3552
	(0.0124)**	(0.5016)	(0.0106)**
BS	-0.0318	0.4718	-0.0318
	(0.0677)***	(0.0000)*	(0.0620)***
R^2	0.5273	0.8719	0.6273
Adjusted R^2	0.5775	0.8308	0.6775
Durbin Watson	0.3669	0.2437	0.3669
F-Statistics	2.5546	21.1929	2.5546
Prob (F-statistics)	0.0463	0.0000	0.0463
Chow Test		0.0000	
Hausman Test		0.1287	

Significant: 1%*, 5%**, 10%***

The pooled regression model results reveal that HHDI (Herfindahl-Hirchman Deposit Index) and HHDI (Herfindahl-Hirchman Loan Index) have a negative and positive insignificant effect on CAR (Capital adequacy ratio). DIV (Diversification ratio) has a negative significant effect on CAR (Capital adequacy ratio) at a 5% level of significance. BS

(Board Size) has a negative significant effect on CAR (Capital adequacy ratio) at a 10% level of significance. The co-efficient of determination using r-squared shows that the independent variables (HHDI, HHLI, DIV and BS) explained 52.73% variation in the selected deposit money banks in Nigeria. It also shows that 57.75% are explained by other variables not captured in the model. The overall statistical level of the model shows that the model is fit for forecasting, giving the F-statistics of 2.55 and its probability value of 0.04. Since the p-value is lower than 0.05, we concluded that the model is statistically significant and brings about the acceptance of the alternative hypothesis.

The fixed effect model results revealed that HHDI (Herfindahl-Hirchman Deposit Index), HHDI (Herfindahl-Hirchman Loan Index) and DIV (Diversification ratio) have a negative insignificant effect on CAR (Capital adequacy ratio). BS (Board Size) has a positive significant effect on CAR (Capital adequacy ratio) at a 1% level of significance. The co-efficient of determination using r-squared shows that the independent variables (HHDI, HHLI, DIV and BS) explained 87.19% variation in the selected deposit money banks in Nigeria. It also shows that 83.08% are explained by other variables not captured in the model. The overall statistical level of the model depicts that the model is fit for forecasting, giving the F-statistics of 21.19 and its probability value of 0.00. Since the p-value is lower than 0.05, we concluded that the model is statistically significant and brings about the acceptance of the alternative hypothesis.

The Random effect model results revealed that HHDI (Herfindahl-Hirchman Deposit Index) has a negative insignificant effect on CAR (Capital adequacy ratio). HHDI (Herfindahl-Hirchman loan Index) has a positive significant effect on CAR (Capital adequacy ratio) at a 10% significance level. DIV (Diversification ratio) has a negative significant effect on CAR (Capital adequacy ratio) at a 5% significance level. BS (Bank size) has a negative significant effect on CAR (Capital adequacy ratio) at a 10% significance level. The co-efficient of determination using r-squared shows that the independent variables (HHDI, HHLI, DIV and BS) explained 62.73% variation in the selected deposit money banks in Nigeria. It also shows that 67.75% are explained by other variables not captured in the model. The overall statistical level of the model depicts that the model is fit for forecasting, giving the F-statistics of 2.55 and its probability value of 0.00. Since the p-value is lower than 0.05, we concluded that the model is statistically significant, which brings about the acceptance of the alternative hypothesis.

The chow test helped determine which model from the pooled and fixed effect models would be selected to draw inferences. The chi-square probability is less that 0.05. The fixed effect model is the valid model at the prob value of ($P<0.05$), which was determined before the Hausman test helped choose the inference model from between the fixed effect model and random effect model. The Hausman test, with a chi-square

value of 0.1287, shows the acceptance of the random effect model for drawing inference for the model and objective.

Table 5. Post Estimation Test for Model One

Test	Statistic	d.f	Prob
Breusch-Pagan LM	167.9018	105	0.5031
Pesaran scaled LM	3.305537		0.1309
Pesaran CD	6.458178		0.1230

The Breusch-pagan LM prob indicates that (p>0.05). This indicates that there is no presence of heteroscedasticity in the model above. The Pesaran scaled LM prob indicates that (p>0.05). This indicates there is no cross-dependency in the model above.

Table 6. Regression Analysis Model 2

Dependent Variable: Non-performing Loan

Variable	Pooled	Fixed	Random
C	-0.4579	-9.6957	-0.4579
	(0.3687)	(0.0000)	(0.3713)
HHDI	-22.3274	42.6773	22.3274
	(0.8236)	(0.6610)	(0.0245)**
HHLI	-36.4157	-22.6366	-36.4157
	(0.7491)	(0.8599)	(0.7504)
DIV	0.5007	0.1317	0.5007
	(0.0893)***	(0.6205)	(0.0917)***
BS	0.0221	-1.2921	0.0221
	(0.6375)	(0.0000)*	(0.0393)**
R^2	0.7297	0.7911	0.7297
Adjusted R^2	0.7256	0.7240	0.7256
Durbin Watson	0.1403	1.1277	0.3669
F-Statistics	0.5367	11.7856	0.5367
Prob (F-statistics)	0.7091	0.0000	0.0091
Chow Test		0.0000	
Hausman Test		0.5203	

Significant: 1%*, 5%**, 10%***

The pooled regression model results reveal that HHDI (Herfindahl-Hirchman Deposit Index) and HHDI (Herfindahl-Hirchman Loan Index) have a negative insignificant effect on NPLR (Non-performing loan ratio). DIV (Diversification ratio) has a positive significant effect on NPLR (Non-performing loan ratio) at a 0.1% level of significance. BS (Board Size) has a positive insignificant effect on NPLR (Non-performing loan ratio). The co-efficient of the determination using r-squared shows that the independent variables (HHDI, HHLI, DIV and BS) explained 72.97% variation in the selected deposit money banks

in Nigeria. It also shows that 72.56% are explained by other variables not captured in the model. The overall statistical level of the model reveals that the model is fit for forecasting, giving the F-statistics of 0.5267 and its probability value of 0.7091. Since the p-value is greater than 0.7091, we concluded that the model is statistically insignificant, which brings about the rejection of the alternative hypothesis.

The fixed effect model results revealed that HHDI (Herfindahl-Hirchman Deposit Index), HHDI (Herfindahl-Hirchman Loan Index) have a positive and negative insignificant effect on NPLR (Non-performing loan ratio). DIV (Diversification ratio) has a positive insignificant effect on NPLR (Non-performing loan ratio). BS (Board Size) has a negative significant effect on NPLR (Non-performing loan ratio) at a 1% level of significance. The co-efficient of determination using r-squared shows that the independent variables (HHDI, HHLI, DIV and BS) explained 79.11% variation in the selected deposit money banks in Nigeria. It also shows that 72.40% are explained by other variables not captured in the model. The overall statistical level of the model depicts that the model is fit for forecasting, giving the F-statistics of 11.785 and its probability value of 0.00. Since the p-value is lower than 0.05, we concluded that the model is statistically significant and so brings about the acceptance of the alternative hypothesis.

The Random effect model results revealed that HHDI (Herfindahl-Hirchman Deposit Index) has a positive significant effect on NPLR (Non-performing loan ratio) at a 5% level of significance. HHDI (Herfindahl-Hirchman Deposit Index) has a positive insignificant effect on NPLR (Non-performing loan ratio). DIV (Diversification ratio) has a positive significant effect on NPLR (Non-performing loan ratio) at a 10% level of significance. BS (Bank size) has a positive significant effect on NPLR (Non-performing loan ratio) at a 5% significance level. The co-efficient of determination using r-squared shows that the independent variables (HHDI, HHLI, DIV and BS) explained 72.97% variation in the selected deposit money banks in Nigeria. It also shows that 72.56% are explained by other variables not captured in the model. The overall statistical level of the model shows that the model is fit for forecasting, giving the F-statistics of 53.67 and its probability value of 0.00. Since the p-value is lower than 0.05, we concluded that the model is statistically significant, which brings about the acceptance of the alternative hypothesis.

The chow test helped determine which model from the pooled and fixed effect models would be selected to draw inferences. The chi-square probability is less than 0.05. The fixed effect model is the valid model at the prob value of ($P<0.05$), which was determined before the Hausman test helped choose the inference model from between the fixed effect model and random effect model. The Hausman test, with a chi-square value of 0.5203, shows acceptance of the random effect model for drawing inference for the model and objective.

Table 7. Post Estimation Test for Model Two

Test	Statistic	d.f	Prob
Breusch-Pagan LM	167.9018	105	0.3440
Pesaran scaled LM	3.305537		0.3450
Pesaran CD	6.458178		0.1956

The Breusch-pagan LM prob indicates that ($p>0.05$). This indicates that there is no presence of heterosceckasticity in the model above. The Pesaran scaled LM prob indicates that ($p>0.05$). This indicates there is no cross-dependency in the model above.

CONCLUSION

The findings from objective one revealed that HHDI (Herfindahl-Hirchman loan Index) has a positive significant effect on CAR (Capital adequacy ratio) and DIV (Diversification ratio), and that BS (Bank size) has a negative significant effect on CAR (Capital adequacy ratio). The results agree with the works of Akbar, Rehman, and Arshad (2023) and Abuselidze (2021) that competition in the banking industry would not only spur financial stability but would also increase the level of economic development in the economy. The results also disagree with the works of Rakshit and Bardhan (2020), who gave credence to the competition fragility theory. Objective two revealed that HHDI (Herfindahl-Hirchman Deposit Index) has a positive significant effect on NPLR (Non-performing loan ratio and that DIV (Diversification ratio) and BS (Bank size) have a positive significant effect on NPLR (Non-performing loan ratio). The results agree with the works of Bamigboye, Akinrinola, and Erin (2022) and Olalere et al. (2021) that competition will enhance financial stability in the banking industry. It will also increase the level of financial innovation among the banks that would allow them to sustain the level of competition within the industry. However, the findings disagree with the works of Xia, Lei, and Liang (2019). The Lerner Index, which is another measure of bank competition, does not have a significant impact on the efficiency and stability of deposit money banks. Based on the findings, it is therefore recommended that deposit money banks should diversify their loan portfolio across sectors and customer types to mitigate concentration risk in the deposit money banks. Reallocating capital from less diversified or larger loans to smaller, more diversified segments of the portfolio would spur the level of competition accuracy of the banks.

REFERENCES

Abuselidze, G. (2021). The Impact of Banking Competition on Economic Growth and Financial Stability: An Empirical Investigation. *European Journal of Sustainable Development*, *10*(1), 203-203.

Agostino, M., & Trivieri, F. (2010). Is banking competition beneficial to SMEs? An empirical study based on Italian data. Small Business Economics, 35, 335-355.

Agostino, M., Gagliardi, F., & Trivieri, F. (2012). Bank competition, lending relationships and firm default risk: An investigation of Italian SMEs. International Small Business Journal, 30(8), 907-943.

Akbar, S. W., Rehman, A. U., & Arshad, I. (2023). Impact of Political Risk and Competition on Bank Stability: Case of South Asia and China. *Journal of Policy Research*, *9*(4), 128-137.

Amadi, A., Adetiloye, K. A., Babajide, A. A., & Amadi, I. (2021). Banking system stability: A prerequisite for financing the Sustainable Development Goals in Nigeria. *Banks and Bank Systems*, *16*(2), 103-118.

Amidu, M., & Wolfe, S. (2013). Does bank competition and diversification lead to greater stability? Evidence from emerging markets. *Review of Development Finance*, *3*(3), 152- 166.

Bamigboye, O. A., Akinrinola, M. O., & Erin, O. A. (2022). Competition and financial stability of listed deposit money banks in Nigeria.

Banyen, K. (2021). Financial Integration, Competition and Bank Risk-Taking Behavior. *Journal of Economic Integration*, *36*(2), 282-307.

Beck, T., De Jonghe, O., & Schepens, G. (2013). Bank competition and stability: Cross-country heterogeneity. Journal of financial Intermediation, 22(2), 218-244.

Berger, A. N., Klapper, L. F., & Turk-Ariss, R. (2017). Bank competition and financial stability. In *Handbook of competition in banking and finance*. Edward Elgar Publishing.

Boyd, J. H., & De Nicolo, G. (2005). The theory of bank risk taking and competition revisited. *The Journal of finance*, *60*(3), 1329-1343.

De Nicolo, M. G., Boyd, J. H., & Jalal, A. M. (2006). *Bank risk-taking and competition revisited: New theory and new evidence*. International Monetary Fund.

Demsetz, R. S., Saidenberg, M. R., & Strahan, P. E. (1997). Agency problems and risk taking at banks. *FRB of New York Staff Report*, (29).

Dutta, K. D., & Saha, M. (2021). Do competition and efficiency lead to bank stability? Evidence from Bangladesh. Future Business Journal, 7(1), 6.

Egboro, E. M. (2016). The 2008/2009 banking crisis in Nigeria: The hidden trigger of the financial crash. *British Journal of Economics, Management & Trade, 12*(2), 1-16.

Fiordelisi, F., & Mare, D. S. (2014). Competition and financial stability in European cooperative bank

Hellmann, T. F., Murdock, K. C., & Stiglitz, J. E. (2000). Liberalization, moral hazard in banking, and prudential regulation: Are capital requirements enough?. *American economic review*, *91*(1), 147-165.

Ijaz, S., Hassan, A., Tarazi, A., & Fraz, A. (2020). Linking bank competition, financial stability, and economic growth. *Journal of Business Economics and Management*, *21*(1), 200-221.

Jankovská, A. (2014). Competition, efficiency and soundness in banking.

Kasman, S., & Kasman, A. (2015). Bank competition, concentration and financial stability in the Turkish banking industry. *Economic Systems*, *39*(3), 502-517.

Keeley, M. (1990). “Deposit Insurance, Risk and Market Power in Banking.” American Economic Review December: 1183–1200.

Klingelhöfer, Jan., and Sun, Rongrong.(2019). Macroprudential policy, central banks and financial stability: Evidence from China. Journal of International Money and Finance, 2019, vol. 93, issue C, 19-41. DOI: 10.1016/j.jimonfin.2018.12.015.

Mishkin F.S (1999). Financial consolidation: Dangers and opportunities. Journal of Banking and Finance 23:675–691

Noman A.H.M, Gee C.S, & Isa C.R. (2017). Does competition improve financial stability of the Banking Sector in ASEAN countries? An empirical analysis. PLoS ONE 12(5):e0176546.

OECD. (2010). Competition, Concentration and Stability in the Banking Sector. Competition Law & Policy OECD, Policy Roundtables.Olalere, O. E., Kes, M. S., Islam, M. A., & Rahman, S. (2021). The Effect of Financial Innovation and Bank Competition on Firm Value: A Comparative Study of Malaysian and Nigerian Banks. *The Journal of Asian Finance, Economics and Business*, *8*(6), 245-253.

Rahman, S. M. K., Chowdhury, M. A. F., & Tania, T. C. (2021). Nexus among Bank Competition, Efficiency and Financial Stability: A Comprehensive Study in Bangladesh. *The Journal of Asian Finance, Economics, and Business*, *8*(2), 317-328.

Rakshit, B., & Bardhan, S. (2020). Does Bank Competition Enhance or Hinder Financial Stability? Evidence from Indian Banking. *Journal of Central Banking Theory and Practice*, *9*(special issue), 75-102.

Roman, Angela., and Şargu, Alina Camelia. (2013). Analysing the Financial Soundness of the Commercial Banks in Romania: An Approach Based on the Camels Framework. Procedia Economics and Finance Volume 6: pages 703 – 712. DOI:10.1016/S2212-5671(13)00192-5.

Saurina Salas, J., Jiménez, G., & Lopez, J. A. (2007). How Does Competition Impact Bank Risk Taking?. In *EFA 2007 Ljubljana Meetings Paper, FRB of San Francisco Working Paper* (No. 2007-23).

Shijaku, G. (2017). Bank stability and competition: Evidence from Albanian banking market.

The World Bank. (2018). Global Financial Development Report 2017/2018. *World Bank Publications, The World Bank Group*, 181. *transition economies,* Journal of Financial Stability vol. 7: 38-48.

Yeyati, E. L., & Micco, A. (2007). Concentration and foreign penetration in Latin American banking sectors: Impact on competition and risk. *Journal of Banking & Finance*, *31*(6), 1633-1647.

Xia., H. & Kevin Lei. K., & Liang, J., (2019). "Bank Competition, Efficiency, and Stability in Macau," Accounting and Finance Research, Sciedu Press, vol. 8(4), 157-157.