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Bank market power and banking sector development in Nigeria

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ABSTRACT

The evolution of the banking industry has resulted in the implementation of several bank reforms. These reforms have affected the structure of the credit market, which is largely dominated by the banking sector, thereby leading to either a competitive or oligopolistic/monopolistic banking sector that encourages market power. While many studies have been conducted on banking sector development and economic development, few have focused on bank market power. In light of this, the study undertook the primary objective of analyzing the effect of commercial bank market power on banking sector development in Nigeria from 1981 to 2020, using the error correction model and ordinary least squares estimation technique. The results from the banking sector development model showed that market power, measured by the five commercial bank aggregate concentration ratio (CBACR_5), had a positive impact on banking sector development within the period under study. The impact was significant even after two years. Consequently, the study recommended that efforts to ensure an efficient and competitive banking system should not be entirely sacrificed in creating a banking sector that is competitive, but should ensure a tradeoff between competition and market power to meet the varied investment needs of small and medium-scale enterprises.

Contribution/ Originality: This study contributes to the literature by examining the effect of market power on banking sector development in Nigeria. It is the first macro-level analysis using the aggregate concentration ratio to measure market power, offering an alternative to the commonly used micro-level Lerner index.

1. INTRODUCTION

The connection between the expansion of the banking sector and economic development is established through effective investment. The development of the banking industry involves the establishment and growth of institutions, instruments, and markets that support this investment and growth process. From Schumpeter (1911) to McKinnon (1973), economists have been preoccupied with this link. Numerous studies have demonstrated a strong correlation between the progress of the banking sector, efficient credit allocation, and economic development. Some of these studies include Hasan and Marton (2003); Levine (1997); Mordi (2010); Nzotta and Okereke (2009); Odedokun (1998) and others. Levine (1997) for example, argues that the structure of the credit market has a significant impact on economic development. The implication of the aforementioned is that the configuration of the credit market could hinder economic growth efforts. In Nigeria, as in many developing

countries, the banking sector dominates the financial sector; however, rather than promoting competition, which leads to welfare improvements, this dominance tends to encourage collusion, resulting in oligopoly and obstructing economic growth. The existence of an oligopoly creates strong barriers to entry and expansion due to high capital requirements. The lack of competition results in stagnation, inefficient resource utilization owing to the absence of rivalry, and regulatory inefficiencies as large companies leverage their influence. Conversely, the goal of banking sector development is to enhance credit mobilization and allocation in order to create a more competitive and efficient market. Thus, a competitive and efficient banking sector is vital for fostering and maintaining economic development. This concern is further underlined by banking reforms.

Various banking reforms have occurred in Nigeria, from the 1954 Banking Ordinance to the 2004 bank consolidation. These reforms culminated in the 1986 Structural Adjustment Program (SAP), which was a comprehensive economic reform package aimed at transitioning the Nigerian economy from a government-regulated to a market-regulated economy. The implementation of these reforms resulted in significant changes within the structural banking environment of the Nigerian economy. Prominent among them were the changes in the number of banks in the country. According to the Central Bank of Nigeria Annual Report 2014, the growth in the number of commercial and merchant banks, which constitute the deposit money banks (DMBs), was modest between 1960 and 1986 when SAP was introduced. In 1960, there were 12 commercial banks and no merchant banks, but by 2004, following the bank consolidation, the number of DMBs increased to 24 with 5,639 branches, and by 2019, licensed banks included 22 commercial banks, five merchant banks, and two non-interest banks, with the total number of bank branches at 5,464.

A market-driven economy with a deregulated financial sector is anticipated to boost competition within the banking industry. Increased competition will improve the efficiency of financial intermediation by lowering transaction, monitoring, and information costs. This will result in reduced interest rate spreads. A lower interest rate spread signifies higher deposit rates to increase savings and lower lending rates to incentivize investment. Efficient financial intermediation is also likely to foster research and development (R&D), enhancing human capital and accelerating technological advancement. The outcomes include improved financial performance metrics such as the ratio of broad money to GDP (M2/GDP), private sector credit to GDP (PSC/GDP), lending deposit ratio (LDR), and a reduced value of currency outside banks to broad money supply (COB/M2). All of these factors are expected to boost savings, increase bank lending, enhance investment productivity, and contribute to economic growth. However, if the credit market is oligopolistic, leading to market dominance, this will result in wider interest rate spreads, which in turn means lower deposit rates. The consequence of this would be higher capital costs and a reduced rate of investment. As a result, the anticipated economic development may not be achieved.

Several research studies have been carried out on banking sector development and economic growth in Nigeria, while a few have been done on bank market power and banking sector development. The few that are available, such as those by Ajide and Aderemi (2015); Delis, Kokas, and Ongena (2017), and Aderigha and Takon (2022), primarily concentrate on micro-level analyses within the industry, employing tools like the Herfindahl-Hirschman Index, the Lerner Index, or other micro-analytical methodologies. The Lerner Index, for instance, evaluates a firm's market influence by relating it to marginal costs. In cases where detailed pricing or specific information about a firm's cost structure is lacking, the Lerner Index depends on the price elasticity of demand to measure market influence. Nevertheless, a significant drawback of utilizing the Lerner Index to assess market power is the difficulty in acquiring data on marginal costs. Moreover, it functions as a static measure and does not distinguish between price and marginal cost; hence, it is less efficient unless firms operate under conditions where marginal costs are equivalent to marginal revenues. Additionally, this metric does not reveal whether marginal costs truly reflect production efficiency in relation to economic scale. The present study differs and thereby contributes to existing literature by conducting a macro analysis and employing the aggregate concentration ratio to assess the influence of market power on banking sector development within the Nigerian economy. The aggregate concentration ratio

evaluates the degree to which a few firms disproportionately lead the macro-economy. It is typically calculated based on the share of total activity represented by the largest firms in a given industry or sector. The economic ramifications of aggregate concentration involve the pooling of resources and diverse experiences to enhance market dominance. While this consolidation of resources does not automatically result in advantages for consumers, it provides leverage that can foster funding for increased risk-taking, generating investment opportunities and furthering economic development. Nonetheless, it also heightens oligopoly collaboration within the market. Such collaboration could potentially hinder efficient resource distribution and reduce consumer welfare. Therefore, this study aims to explore whether an oligopolistic credit market structure truly obstructs the development of the banking sector. Ultimately, the study assesses how the market power of commercial banks influences the growth of the banking sector in Nigeria.

The rest of this paper is organized as follows: Section two provides a literature review, while Section three details the research methodology used. This is followed by a discussion of the key findings and results in Section four, and Section five wraps up the study with conclusions.

2. LITERATURE REVIEW

The traditional market power theory states that a concentrated bank market is less competitive and is associated with less credit availability and higher credit prices. This links market concentration to inefficient allocation of credit, which does not lead to economic development. The issue of market concentration is connected with consumer welfare. If efficient enterprises can enter the market and invest significantly to sustain market leadership, or if the market is contestable, or if profits are essential to recuperate investments in valuable technology, then concentration should not pose an issue. If current market participants establish entrance hurdles and yield monopolistic profits, or if concentrated industries are susceptible to collusion and excessively high prices, or if market dominance hinders innovation, then concentration poses a significant issue.

Market concentration in an industry is an indication that the level of control by a small number of firms is high, and they provide a major part of the industry's total production. In a situation of low concentration, there would be competition in the industry and not oligopolistic or monopolistic activities. It is a function of the number of firms and their respective share of the total production. These firms become the leading firms in the market and are identified as "oligopolists," who are aware of their mutual interdependence (Shepherd, 1985). This mutual interdependence is promoted through the existence of barriers that prevent new entrants into the industry or market. A barrier is anything that reduces the likelihood of the entry of firms into the market. According to Jacobson and Andreosso-O'Callaghan (1996) barriers to entry are all types of obstacles at the market edge that make entry for new firms difficult. They consist of all the factors that give incumbent firms advantages over those considering entry into the market, since barriers to entry give the oligopolist higher market power.

Market power is the degree to which a corporation may influence the price of a product by controlling its demand or supply. It is a gauge of the degree of market rivalry and outlines how companies in a market can affect pricing due to the market share they hold (Khemani & Shapiro, 1993). If market power tends toward monopoly power, it may lead to deadweight loss if the firm aims at monopoly profit, and this has welfare implications for consumers. Hence, market power is mostly not encouraged in the economic system. In agreement, Weill, Pruteanu-Podpiera, and Schobert (2008) argued that competition among financial institutions enhances welfare by diminishing the monopolistic power of banks.

Utilizing balance sheet data from commercial banks across the key banking markets of the European Union (EU), Casu and Girardone (2007), explored the empirical connection between competition and efficiency within these banking markets. The researchers employed dynamic panel data methodologies to assess the causal ties between efficiency and competition. Their analysis revealed that efficiency and competition are negatively correlated (causation), whereas the causal relationship going from efficiency to competition is weak but positive.

Ultimately, the findings suggest that a correlation between competition levels and concentration may not always exist. The negative association between efficiency and competitiveness indicates a propensity towards market power, which does not foster economic advancement as it implies a deterioration in customer welfare. De Guevara and Maudos (2007) on the other hand, analyzed the Spanish banking sector from 1986 to 2002 to identify the key factors influencing market power in the industry. The research evaluated efficiency through X-efficiency and market power using the Lerner index. Their main argument is that banks act as price takers in the deposit market while maintaining some market power when setting lending interest rates. By presuming that each bank offers only one unique type of loan that differentiates it from its competitors, the model accommodates the notion of product differentiation. Musonda (2008) estimated the level of competition in Zambia's commercial banking sector during the post-liberalization era using panel data methodologies and the Panzar-Rosse approach. The findings demonstrate that monopolistic competition was the basis for Zambian banks' revenue generation. The findings also demonstrate that interest revenue is subject to more fierce competition than total income. Comparatively speaking, foreign private banks are more competitive than their local equivalents. With regard to big banks versus small banks, this isn't the case. Compared to the latter, the former are more competitive.

Lubis (2012) examined the extent of market power held by Indonesian commercial banks in the country's lending sector. The study employed the Bresnahan-Lau oligopoly model, which estimates market power through structural equations, providing a different perspective than the commonly used Structure-Conduct-Performance (SCP) model in market power analyses. The Bresnahan-Lau model successfully quantified market power directly from structural equations, eliminating the need for data on accounting profits and actual costs. The principal finding of the study indicated that the market power of commercial banks in the credit market is relatively low, suggesting a high degree of competition within Indonesia's credit market. Ferreira (2012) explored the relationship between economic growth and the efficiency of banking institutions, which was assessed using Data Envelopment Analysis (DEA), as well as the concentration of banking markets evaluated using the Herfindahl-Hirschman Index (HHI) and the proportion of total assets held by the three largest banks (C3). The study examined how these banks and prevailing market conditions influenced GDP and its components, including final consumption expenditure, gross fixed capital formation, exports, and imports of goods and services, across a panel of all 27 EU countries from 1996 to 2008. The findings indicate that bank cost efficiency generally has a positive effect on economic growth.

Using time-series regression analysis, Ugwunta, Ani, Ugwuanyi, and Ugwu (2012) conducted a study examining the influence of the banking sector's structure on bank performance in Nigeria over a decade (2001-2010). They evaluated the relationship between the industry's structure and various other factors in relation to bank performance. They concluded that the banking industry in Nigeria operates under an oligopolistic framework. Muhammad (2012) conducted an empirical study on interest rate spread in Nigeria during the post-liberalization era using a panel data regression model. The findings demonstrated that Nigerian commercial banks have market power in both the loan and deposit markets, allowing them to transfer the majority of costs and risks (inefficiencies) to their clients. These conform to CBN assertions that the credit market is oligopolistic. The reviewed works in this sub-section agree that market power reduces competition. However, competition may not always lead to cost efficiency.

Moyo, Nandwa, Council, Oduor, and Simpasa (2014) investigated the stability of the banking sector, competitiveness, and financial reforms in sub-Saharan Africa. The research methodically assessed the relevance of various bank-specific, macroeconomic, and institutional factors in understanding the relationship between financial liberalization, banking competitiveness, and banking stability or fragility, using a duration model. The analysis specifically examined the assertion that increased competitiveness in the banking sector enhances financial stability due to financial deregulation. The outcomes revealed that bank-specific factors, following the CAMELS framework (Capital, Assets, Management, Earnings, Liquidity, and Sensitivity), are consistent indicators of which banks are likely to encounter financial troubles. Additionally, segmenting the sample to highlight the financial liberalization

period, which fosters competition in the banking sector, produced noteworthy insights related to international bank entry, regulatory easing, and economic freedom, all of which contributed to heightened competition in the banking industry. An extended lead time to bank distress incidents was linked to higher levels of competition in the post-reform period compared to the pre-reform period.

Using the Breshnahan-Lau technique, Ajide and Aderemi (2015) investigated the market power of the Nigerian deposit market. The study employed Two-Stage Least Squares (TSLS) to estimate the model utilizing annual data from 1986 to 2012. The findings showed that the Nigerian deposit money market continued to have monopolistic competition, and it was determined that the industry's level of competition was enhanced by the changes implemented in the country's banking sector. Carbó-Valverde, Mansilla-Fernández, and Rodríguez-Fernández (2016) used the Generalized Method of Moments (GMM) estimator to analyze both the short- and long-term effects of bank market power on business investment and credit supply to UK firms from 1998 to 2009. Their results showed that an increase in bank market power initially leads to a reduction in business investment, but this investment eventually recovers. By conducting a Granger causality test, they established that bank market power influences business investment, rather than the reverse. They also illustrated how the dominance of banks impacts the cash flow of small and medium-sized enterprises. This finding suggests that stronger market power within the loan market results in a temporary decline in overall investment, negatively affecting economic growth and development in the short term. However, investment does rebound over time, contributing to economic growth. This short-term impact is particularly pronounced in a country like Nigeria, where small and medium-sized enterprises are prevalent and heavily reliant on bank loans.

Delis et al. (2017) employed the Lerner index to evaluate market power before and after loan origination, aiming to empirically explore the connection between bank market power and corporate performance. Their analysis focused on 25,236 syndicated credit facilities granted to 9,029 non-financial companies in the US by 296 banks during the period from 2000 to 2010. The results reveal that when banks with substantial market power collaborated with relatively underperforming firms, their performance improved. More importantly, the dominance of banks in the market positively influences business profitability. Aderigha and Takon (2022) utilized the ARDL model to study the relationship between commercial bank market power and economic growth in Nigeria from 1981 to 2020. The empirical results indicated that there was an insignificant relationship between deposit money banks and the real growth rate in Nigeria, implying that commercial banks in the country lack market power over the pricing of their products and services. Das and Pati (2024) investigated the factors influencing commercial bank market power in Indonesia from 2011 to 2023, employing the adjusted Lerner index and regression estimation methods. Their findings revealed that deposit money banks in Indonesia possessed significant market power, with the primary determinants being capitalization, diversification, operational inefficiency, asset quality, and GDP growth rate.

3. METHODOLOGY

Economists use concentration ratios to measure market power. In the industry, such measurements include concentration ratios (CR), Hirschman-Herfindahl index (HHI), Lerner index, H-statistic, and others. Concentration is measured through market share, while market share (MS_{ij}) of firm I (F_i) in a particular industry (I_j), according to Jacobson and Andreosso-O'Callaghan (1996), is defined as the share of firm i's sales revenue in the total sales revenue of industry j.

Concentration ratio for the economy, according to Shepherd (1985), is measured by the Aggregate Concentration Ratio (ACR). The ratio is a measure by which the activities of a few firms dominate the economy. Thus, in the financial sector, and in particular the credit market, the aggregate concentration ratio refers to the extent to which a few banks (in this study, we use the five largest loan-granting banks in Nigeria) dominate the

entire credit market. It is calculated as the ratio of total loans granted by these five banks in relation to the total loans financed by the financial sector of the economy. Hence, we posit that;

$$CBACR_5 = \frac{\sum^{m}_{i=1} Loan_i}{\sum^{n}_{j=1} Loan_j} \times 100 \quad (1)$$

Where $CBACR_5$ is the five commercial banks' aggregate concentration ratio, m defines the i^{th} loan of the five banks, and n defines the j^{th} loan of all loan-granting institutions in the economy. When the aggregate concentration ratio is between 0 and 0.49 (0% - 49%), there is competition; between 0.5 and 0.79 (50% - 79%), there is oligopoly power; and between 0.8 and 1 (80% - 100%), there is monopoly power (Shepherd, 1985).

3.1. Model Specification

3.1.1. Banking Sector Development Model

The model for banking sector development is anchored on the eclectic model of McKinnon-Shaw Interest Rate Liberalization theory. It follows the studies of Iganiga (2010); Raza, Shahzadi, and Akram (2014); Han and Pei-Tha (2010); Nzotta and Okereke (2009); Awdeh (2012); Ayunku and Etale (2014); Adelakun (2010) and Nwani and Bassey (2016). Han and Pei-Tha (2010) specified banking sector development as:

$$BSD = f(RGDP, RI) \quad (2)$$

Where BSD is banking sector development, RGDP is real gross domestic product, and RI is real interest rate.

Following McKinnon-Shaw Interest Rate Liberalization Theory, the banking sector development can work through interest rate liberalization and bank reforms. Positive real interest rates in the reviewed theories promote financial development through increased volume of savings mobilization and stimulate growth through increases in the volume and productivity of invested capital. Based on these theoretical foundations, we modify Equation 2 to include a vector of other variables as used by Iganiga (2010); Nzotta and Okereke (2009), Awdeh (2012) and others that affect banking sector development.

$$BSD = f(RGDP, RI, Z) \quad (3)$$

Where BSD = Banking Sector Development.

RGDP = Real Gross Domestic Product.

RI = Real Interest Rate.

Z = Vector of other variables.

The vector Z includes the commercial bank aggregate concentration ratio that measures market power, along with other variables affecting banking sector development such as assets of banks, cash reserve ratio, number of banks, and bank reforms, while the loan deposit ratio and human development index are control variables.

According to McKinnon and Shaw's liberalization theory, competition brings more money into the economy, while monopoly or oligopoly hampers the supply of credit. Bank reforms, on the other hand, open up the market. The implication of this is that the structure of the credit market [depending on the presence of market power (CBACR) or competition] will affect the Loan Deposit Ratio (LDR), which determines the capacity of bank deposits to sustain loans granted by the banks. Worker's productivity, which is raised through education and training, is captured by human capital development. Therefore,

$$Z = f(CBACR_5, AST, LDR, CRR, HDI, NOB, REFDUM)$$

We reformulate Equation 3, taking into account our proxy for Banking Sector Development (BSD). By adopting the financial sector deepening model of Private Sector Credit as a ratio of GDP (PSC/GDP), we already incorporate GDP, which accounts for RGDP in Equation 3. Additionally, we use the interest rate spread (IRS) to capture the real interest rate. Equation 3 now becomes;

$$PSC/GDP = f(IRS, CBACR_5, AST, LDR, CRR, HDI, NOB, REFDUM) \quad (4)$$

Where PSC/GDP = Private Sector Credit as a Ratio of Gross Domestic Product

IRS = Interest Rate Spread (In percentages)

CBACR = Commercial Bank Aggregate Concentration Ratio, which measures market power

AST = Bank Asset in N'billion

LDR = Loan Deposit Ratio

CRR = Cash Reserve Ratio.

HDI = Human Development Index as a proxy for economic development.

NOB = Number of Banks in Nigeria (Taken as annual total for each year).

REFDUM = Bank Reforms as Dummy (1 if there is reform and 0 if no reform).

For the regression function to be in estimation form, Equation 4 is reformulated in a linear form to include the stochastic error term.

$$PSC/GDP = \propto_0 + \propto_1 IRS + \propto_2 CBACR_5 + \propto_3 AST + \propto_4 LDR + \propto_6 HDI + \propto_7 NOB + \propto_8 REFDUM + \varepsilon \quad (5)$$

Where ε = stochastic error term.

CBACR is determined by market structure and measures the efficiency of credit allocation in the economy, and AST, LDR, CRR, HDI, NOB, and REFDUM are variables that capture bank consolidation, CBN regulation, growth of the banking sector, and growth of the economy. To estimate Equation 5, the study utilized the ordinary least squares (OLS) multiple regression estimation technique. The OLS technique is favored because it minimizes the error sum of squares and has several advantages, such as unbiasedness, consistency, minimal variable inclusion, and efficiency. It is widely used due to its property of being BLUE (Best Linear Unbiased Estimator), as well as its simplicity and ease of understanding (Gujarati, 2003).

3.2. Definition of Variables and A Priori Theoretical Expectation

Dependent variable: Private Sector Credit as a Percentage of Gross Domestic Product (PSC/GDP) serves as an indicator for the development of the banking sector. This ratio, represented as a percentage of GDP, measures the level of financial resources that deposit-taking institutions, excluding the central bank, allocate to the private sector. A higher value of this index indicates that more financial resources are available to the private sector of the economy, leading to greater opportunities for growth and success. This ratio reflects the essential function of financial intermediaries, which is to transfer savings to investors (Abubakar & Gani, 2013). Additionally, it emphasizes the critical role that the financial sector, especially deposit money banks, plays in providing financing for the economy (Levine, 2002). This measure has been extensively utilized in research to evaluate the level of banking system development and the efficiency of commercial banks in lending to the private sector for financing growth. One could argue that this indicator accurately reflects the banking industry's traditional involvement in credit allocation and savings mobilization. This informed the choice of this measure in the study.

Independent Variables:

Commercial Bank Aggregate Concentration Ratio (CBACR): This is the ratio of the five commercial banks' loans to the total loans granted by loan-granting institutions in the economy. CBACR, which measures market power in the credit market, is an important factor in credit allocation in the economy. Given the dominant position of the banking industry in the financial sector and the dominance of commercial banks' loans, a high rate of CBACR may tend towards oligopoly dominance by the five largest loan-granting commercial banks. Based on economic theory, it is expected that there is an inverse relationship between bank sector development and the commercial banks' aggregate concentration ratio.

Interest Rate Spread (IRS) in per cent: The difference between lending rates and deposit rates is referred to as the interest rate spread. The average weighted deposit rate (AWDR) represents the weighted average of all interest-bearing deposits in commercial banks along with their corresponding interest rates, whereas the average weighted prime lending (AWPL) rate utilized in this research refers to the lending rate assigned to the prime clients of commercial banks. A high interest rate spread indicates a low deposit rate coupled with a high lending rate, which, according to McKinnon-Shaw theory, fails to promote savings and investment. This scenario is

detrimental to the development of the banking sector. Consequently, a negative relationship between the interest rate spread and the development of the banking sector is anticipated.

Assets (AST): The assets of a bank indicate the value or worth of the bank. The higher the asset value, the better positioned a bank is in conducting its business. It is expected that a direct link exists between banking sector development and the assets of banks.

Loan Deposit Ratio (LDR): The loan-to-deposit ratio measures the coverage of loans to stable funding, which usually comes from deposits from households and non-financial institutions. As the name suggests, it is the proportion of total deposits to total loans made by banks. When the ratio falls below 100 percent, it indicates that banks depend on their deposits to provide loans to their clients. If the percentage is greater than 100%, it indicates that banks have taken out loans from sources other than their deposits and relend them to clients at a higher interest rate. A ratio that is too low could mean that banks are not getting the best return possible. If the ratio is excessively high, banks may not have sufficient liquidity to cover any unanticipated crisis or funding shortfall. However, the higher the LDR, the more development there is in the banking sector.

Cash Reserve Ratio (CRR): This is the minimum of customers' deposits that is kept by banks as a ratio of total customers' deposits, which commercial banks must hold as reserves that must not be lent out. The higher the cash reserve requirement, the less money available to banks to do business with or to grant loans to customers. The cash reserve ratio is a determinant of the liquidity of the economy and also affects economic activities. Based on economic theory, it is expected that a negative relationship exists between bank sector development and the cash reserve requirement.

Human Development Index (HDI): This indicator is a combination of a nation's per capita income, education, and life expectancy (health). It measures the overall development of a country, and given that higher education levels and health of workers positively affect workers' output, it is expected that it has a positive impact on banking sector development.

Number of Banks (NOB): This includes the number of deposit money banks (DMBs) on a yearly basis. Deposit Money Banks prior to 2001, when universal banking was introduced, consisted of commercial and merchant banks. It is expected that the higher the number of banks, the higher the competition, and therefore the higher the development of the banking industry.

Reform (DUM): This represents the reform changes in the banking industry in Nigeria. The reform periods take the value one (1) for reform periods and zero (0) for no reform periods. A positive relationship is expected between reforms and banking sector development.

3.3. Sources of Data

The required data for the study are secondary data. Relevant publications, including the Central Bank of Nigeria (CBN) Statistical Bulletins, Research and Data Services (REDASEL), various World Bank publications, and commercial banks' annual financial reports, will be used.

4. RESULTS AND DISCUSSION

4.1. Unit Root Test

Most time series variables exhibit trends and are non-stationary. Incorporating non-stationary variables into a model can result in misleading regression outcomes (Granger & Newbold, 1977). The stationarity characteristics of the variables included in the model were evaluated using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The findings from the unit root tests are presented in Table 1a.

Table 1 (a). Augmented Dickey-Fuller unit root tests.

Variable	Level		1st Difference		Remarks
AST	-1.256454		-4.582391*		I(1)
CBACR_5	-0.524662		-2.252815**		I(1)
CRR	-1.554190		-1.719417***		I(1)
HDI	-1.229006		-6.673681*		I(1)
IRS	-1.550547		-6.143331*		I(1)
LDR	-1.525291		-3.141119*		I(1)
NOB	-0.954210		-4.291139*		I(1)
PSC_GDP	-1.534185		-5.675360*		I(1)
Test critical values:	1% level	-2.650145	1% 1st Diff	-2.641672	
	5% level	-1.953381	5% 1st Diff	-1.952066	
	10% level	-1.609798	10% 1st Diff"	-1.610400	

Note: *Significant at 1% **Significant at 5% *** Significant at 10%

Table 1b presents the Phillip-Perron unit root test properties of the variables used in the model

Table 1(b). Phillip-Perron unit root test.

Variable	Level		1st Difference		Remarks
AST	-2.773923*				I(0)
CBACR_5	-0.565997		-4.384810*		I(1)
CRR	- 0.425239		-3.554602*		I(1)
HDI	-1.605185		-6.673270*		I(1)
IRS	-1.579793		-7.706432*		I(1)
LDR	-0.959210		-3.141119*		I(1)
NOB	-1.245374		-4.296465*		I(1)
PSC_GDP	-1.166050		-6.615267*		I(1)
Test critical values:	1% level	-2.632688	1% 1st Diff	-2.647310	
	5% level	-1.950687	5% 1st Diff	-1.951000	
	10% level	-1.611059	10% 1st Diff"	-1.610907	

Note: *Significant at 1%

4.2. Co-Integration Test

The Johansen co-integration test indicates that there is evidence supporting co-integration between the development of the banking sector and various factors such as bank assets, the concentration ratio of commercial banks, cash reserve requirements, the human development index, interest rate spreads, loan-to-deposit ratios, the number of banks, and bank reforms.

Consequently, we reject the null hypothesis that asserts there is no co-integration relationship, with a significance level of 5 percent. Table 2: The Johansen test results for co-integration relationships among the selected variables are illustrated. The trace statistic results suggest that there are at least three co-integrating equations.

Conversely, the maximum eigenvalue test indicates that there are at least four co-integrating equations, as presented in Table 2. This implies that all the explanatory variables and the dependent variable share a long-term relationship, and with co-integration established, the regression results were analyzed and diagnosed.

Table 2. Johansen co-integration test result for banking sector development.

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
None *	0.999995	695.7895	239.2354	0.0000
At most 1 *	0.972333	302.8357	197.3709	0.0000
At most 2 *	0.921743	188.0352	159.5297	0.0005
At most 3	0.81395	106.5071	125.6154	0.3976
At most 4	0.49924	52.69152	95.75366	0.9942
At most 5	0.413929	30.55942	69.81889	0.999
At most 6	0.196129	13.46135	47.85613	1.0000
At most 7	0.11003	6.47521	29.79707	0.9996
At most 8	0.069672	2.745065	15.49471	0.9772
At most 9	0.013474	0.43409	3.841466	0.51
Unrestricted cointegration rank test (Maximum eigenvalue)				
Hypothesized no. of CE(s)	**Eigenvalue**	**Max-eigen statistic**	**0.05 critical value**	**Prob****
None *	0.999995	392.9538	64.50472	0.0001
At most 1 *	0.972333	114.8005	58.43354	0.0000
At most 2 *	0.921743	81.52806	52.36261	0.0000
At most 3 *	0.81395	53.8156	46.23142	0.0065
At most 4	0.49924	22.1321	40.07757	0.9122
At most 5	0.413929	17.09807	33.87687	0.918
At most 6	0.196129	6.986145	27.58434	0.9998
At most 7	0.11003	3.730145	21.13162	0.9997
At most 8	0.069672	2.310975	14.2646	0.9817
At most 9	0.013474	0.43409	3.841466	0.51

Note: Trace test indicates 3cointegrating eqn(s) at the 0.05 level
Max-eigenvalue test indicates 4cointegrating eqn(s) at the 0.05 level.
* denotes rejection of the hypothesis at the 0.05 level.
**MacKinnon, Haug, and Michelis (1999) p-values.

Table 3. Result of the over-parameterized banking sector model.

Dependent variable: D(LOG(PSC_GDP))				
Variable	**Coefficient**	**Std. error**	**t-statistic**	**Prob.**
C	-0.254136	0.151019	-1.68282	0.1267
D(LOG(PSC_GDP(-1)))	-0.351593	0.553633	-0.63507	0.5412
D(LOG(IRS))	-0.006538	0.167569	-0.03902	0.9697
D(LOG(CBACR_5))	0.24814	0.416009	0.596479	0.5656
D(LOG(CRR))	-0.447975	0.195715	-2.288917**	0.0479
D((NOB))	-0.006524	0.004916	-1.32714	0.2171
D(LOG(AST(-1)))	1.103991	0.913329	1.208755	0.2576
D(LOG(IRS(-1)))	0.036972	0.194038	0.190542	0.8531
D(LOG(CRR(-1)))	0.037668	0.113576	0.331655	0.7477
D(LOG(HDI(-1)))	1.552837	3.977208	0.390434	0.7053
D(LOG(LDR(-1)))	0.090902	0.291335	0.31202	0.7621
D((NOB(-1)))	0.006329	0.005122	1.235663	0.2479
D(REF)	0.407918	0.189379	2.153982**	0.0596
D(REF(-1))	0.28656	0.176601	1.622644	0.1391
D(REF(-2))	0.197409	0.177845	1.110006	0.2958
D(LOG(CBACR_5(-1)))	1.787572	0.71471	2.501114**	0.0338
D(LOG(AST(-2)))	-0.102787	0.816148	-0.12594	0.9025
D(LOG(IRS(-2)))	0.664777	0.347189	1.914744***	0.0878
D(LOG(CRR(-2)))	0.106772	0.096613	1.105157	0.2978
D(LOG(HDI(-2)))	-0.23102	4.291805	-0.05383	0.9582
D(LOG(LDR(-2)))	-0.832409	0.42196	-1.972718***	0.08
D(LOG(NOB(-2)))	-0.049434	0.312205	-0.15834	0.8777
D(LOG(CBACR_5(-2)))	-0.819777	0.412224	-1.988670***	0.078
ECM2L(-1)	-0.997803	0.454248	-2.196605**	0.0556
R-squared	0.823882			
F-statistic	1.830521			
Adjusted R-squared	0.673801			
Prob (F-statistic)	0.174431			
Durbin-Watson stat	2.518246			

Note: (**, ***) denotes rejection of the hypothesis at (5%, 10%) significance.

In order to determine the impact of the market power of the five largest loan-granting banks on banking sector development, the study adopted the general-to-specific method of Hendry and Richard (1982). The statistical

rationality of the general-to-specific technique and the fact that the theory underlying the models typically has little bearing on the lag structure of a model are its two main advantages. As a result, the data themselves heavily influence the lag structure included in the final model. Additionally, it is generally accepted that the statistical consequences of removing pertinent variables are more severe than those of including irrelevant variables. In light of the above, the study estimated the generalized unrestricted dynamic short-run error correction model from which the specific (parsimonious) model was derived and estimated. The estimated generalized unrestricted (over-parameterized) error correction model and its analysis are reported below. Table 3 presents the results of the Over-Parameterized Banking Sector Model.

4.2.1. Interpretation of the Result of the Over-Parameterized Banking Sector Model

Table 3 presents the result of an over-parameterized banking sector model. The R^2 value of 0.82 indicates that approximately 82 percent of the variations in the development of the banking sector in Nigeria can be attributed to the explanatory variables included in the model. The Durbin-Watson statistic, which is around 2.5, implies a slight positive autocorrelation in the residuals. However, the probability of the F statistic, approximately 0.17, suggests that collectively the variables do not significantly explain banking sector development. The error correction parameter is appropriately signed and statistically significant, demonstrating a long-term relationship between the market power of commercial banks and the other variables in the model. Before estimating the model for banking sector development, it is crucial to determine the appropriate lag length for the variables involved. To achieve this, the study utilized both the SIC and AIC criteria to identify the suitable lag lengths. As indicated in Table 4, both FPE and AIC suggest a lag order of 2, while SC and LR indicate a lag order of 1.

Table 4. VAR Lag Order Selection Criteria.

Lag	LogL	LR	FPE	AIC	SC
0	25.55271	NA	3.42e-13	-0.326630	0.571229
1	324.4370	386.7914*	3.89e-18	-12.02571	-6.638552*
2	493.1469	119.0893	5.85e-19*	-16.06746*	-6.191013

Note: * indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5%level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

When selecting between two competing models, the model with the lowest Akaike Information Criterion, Schwarz Criterion, and Hannan-Quinn Criterion values is considered to be superior. This principle guides the decision between over-parameterized and more efficient models. In this instance, the more efficient model is preferred as it exhibits the lowest value of these criteria. The efficient ECM estimation is derived by removing the jointly insignificant variables from the over-parameterized model. This is illustrated in Table 5.

Table 5 presents the estimated dynamic short-run equation, where the R^2 value of 0.707663 indicates that only 71 percent of the variation in the dependent variable is accounted for by the explanatory variables, while the remaining 29 percent is attributed to the error term or white noise. The F-Statistic probability value of 0.000199 shows that the explanatory variables are statistically significant as a group. The Durbin-Watson value of 2.052881 suggests there is no autocorrelation. The coefficient of the error correction term (ECM) -0.347 demonstrates that the current deviation of the banking sector's growth from the long-run equilibrium level is corrected by 35%. It carries the expected negative sign and is statistically significant at the 1% level. The relevance of the ECM confirms the cointegration relationship, which suggests that the banking sector's development and other influencing factors within the model achieve a long-term stable equilibrium.

Table 5. Result of the parsimonious ECM of the banking sector development model.

Dependent Variable: D (LOG (PSC_GDP))				
Variable	**Coefficient**	**Std. error**	**t-Statistic**	**Prob.**
C	-0.013780	0.028850	-0.477636	0.6374
D((NOB(-1)))	0.006625	0.002578	2.569754**	0.0171
D((NOB))	-0.007786	0.002550	-3.053518*	0.0056
D(LOG(CRR))	-0.369344	0.071931	-5.134685*	0.0000
D(REF)	0.147170	0.083716	1.757971***	0.0921
D(LOG(CBACR_5(-1)))	0.959900	0.300839	3.190741*	0.0041
D(LOG(IRS(-2)))	0.400305	0.122218	3.275337*	0.0033
D(LOG(LDR(-2)))	-0.637272	0.213435	-2.985791*	0.0066
D(LOG(CBACR_5(-2)))	-0.738535	0.260190	-2.838447*	0.0093
ECM2L(-1)	-0.347270	0.048450	-7.227572*	0.0000
R-squared	0.707663			
Adjusted R-squared	0.593271			
Durbin-Watson stat	2.052881			
F-statistic	6.186271			
Prob (F-statistic)	0.000199			

Note: *(**, ***) denotes rejection of the hypothesis at 5% (1%, 10%) significance

Furthermore, evidence from the estimated model shows that market power captured by the aggregate concentration ratio of the five largest commercial banks (CBACR_5) significantly influences banking sector development in Nigeria during the analyzed period. The impact remains significant even after two years. This suggests that market power (CBACR_5) has a lagged effect on banking sector development lasting more than two years after the initial impact. Holding other variables in the model constant, the short-run impact of a 1 percent increase in market power (CBACR_5) after one year is 0.95 percent, but this decreases by 0.73 percent after the second year. The coefficients for both the current and lagged terms of the CBACR_5 variable imply that the immediate short-run impact of a 1 percent increase in CBACR_5 on banking sector development is 0.95 percent after the first year, decreasing to 0.22 percent after the second year following the increase. This result indicates that a reduction in market power (CBACR) among the five largest commercial banks granting loans in Nigeria leads to an enhancement in banking sector development (PSC/GDP) by fostering more competition among banks. In other words, it signifies that market power in Nigeria's banking sector influences credit provided to the private sector as a share of gross domestic product (PSC/GDP). This accurately reflects the reality in Nigeria, where market power positively impacts banking sector development. The overall positive correlation between market power (CBACR) and banking sector development (PSC/GDP) in Nigeria contradicts our initial economic assumption of a negative relationship. However, previous studies referenced in this research, such as those by Maudos and De Guevara (2006), Carbó-Valverde et al. (2016) and Delis et al. (2017) support the model's assertion of a positive influence of market power on banking sector development. The findings of these studies resonate closely with the circumstances in Nigeria. Following the consolidation phase from 2010, market power in Nigeria led to an increase in credit to the private sector despite a wide interest rate spread, indicating the presence of relational banking between banks with substantial market power and businesses within the economy.

Looking at the control variables, it is observed that the Cash Reserve Ratio (CRR) has a significant negative relationship with PSC/GDP, in line with a priori economic expectations. The Loan Deposit Ratio (LDR) also has a significant negative short-run relationship with banking sector development (PSC/GDP), contrary to economic expectations. The implication is that an increase in the loan deposit ratio does not lead to the development of the banking sector.

Interest rate spread (IRS) has a positive relationship with banking sector development (PSC/GDP), contrary to a priori economic expectations, and has a significant impact on banking sector development as indicated by its low p-values. The impact of the loan deposit ratio (LDR) and cash reserve ratio (CRR) on banking sector development (PSC/GDP) is statistically significant at the 1 per cent level. The positive effect of the IRS and its significant impact

on PSC/GDP make interest rates an important instrument for monetary authorities in stimulating banking sector development. The number of banks (NOB) is negatively related to banking sector development, contrary to a priori economic expectations. However, its impact is statistically significant. This is evident in the reduction in the number of banks in the Nigerian economy following consolidation, which decreased from 89 to 25, yet the market structure remained competitive until 2011, when it became oligopolistic. Banking sector reforms, proxied by REF, have a positive impact on banking sector development, consistent with a priori expectations. The variable is significant at the 10 per cent level (P-value = 0.09), but not at the conventional 1 per cent and 5 per cent critical values.

5. SUMMARY AND RECOMMENDATIONS

The competition level and market power of the banking industry, as the dominant industry in the financial sector, determine to a great extent the tone of investment and economic development of the Nigerian economy. The study undertook the cardinal objective of analyzing the effect of commercial bank market power on banking sector development in Nigeria. The study is situated against the background of the cardinal role of credit in driving economic growth and development in the economy through the intermediating process of credit mobilization and allocation.

The major finding from the study revealed that commercial bank market power (CBACR), contrary to a priori theoretical expectation, had a statistically significant positive short-run effect on banking sector development in Nigeria for the period under consideration. The impact was significant even after two years. This suggests that market power (CBACR_5) had a lagged effect on banking sector development lasting more than two years after impact. Consequently, the increase in commercial bank market power leads to an increase in banking sector development through an increase in bank credit allocation to the private sector of the Nigerian economy. Banks with market power support small and prospective small firms through relationship banking, which drives private sector growth. As relationship banking increases, small firms are more encouraged to invest. Private sector credit yielding faster and greater returns will develop the Nigerian economy faster than public sector credit, thereby affirming the supply-leading and demand-following theory. This leads to further development of the banking sector. Based on the analysis and the results found, the study recommended the following: First, bank reform policies to make credit mobilization and allocation efficient and competitive are commendable; however, monetary authorities should ensure a tradeoff between competition and market power in line with the development needs of the economy. Second, as market power encourages relationship banking, which promotes the growth of small firms, monetary policy tools like interest rates should be effectively utilized to encourage banking sector development and credit allocation to sectors like education and health to bring about economic development. Finally, the positive effect of commercial bank market power should be used to develop the banking sector through the expansion of banking services.

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