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Effect of Financial Structure on The Efficiency of Financial Intermediation in The Nigerian Banking Sector

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ABSTRACT: Banks are financial intermediaries that accepts deposits and lends same out efficiently, to make profits and remain a going concern. This study examines the effect of financial structure on the efficiency of financial intermediation in Nigerian banking sector between 1981-2020. The study which relied on interest rate spread as proxy for efficiency of financial intermediation; aggregate capital funds, aggregate funds through money market facilities and monetary policy rate (MPR) as proxies for financial structure. Autoregressive Distributed Lag (ARDL) modelling technique was used for analysis. Results reveals that long-term funds (aggregate capital funds) have statistical significance on efficiency of financial intermediation while short-term funds (aggregate money market funds) have negative statistical significance and MPR is not statistically significant. From these findings, the study recommends discussing shoring up again, capital requirements for Nigerian banks and recapitalizing ailing ones; mobilizing cheaper customers' deposits to meet short-term obligations against reliance on money market facilities; and maintenance of the MPR at the lowest possible to enable cheaper pricing of funds for better efficiency.

Keywords: Financial Structure, Financial Intermediation, Autoregressive, Monetary Policy Rate

INTRODUCTION

One of the activities of financial institutions involves intermediating between the surplus and deficit sectors of the economy. Banks have been identified as one of the major financial intermediaries by accepting deposits and lending to a large number of agents, holding liquid reserves against predicated withdrawal demand, issuing liabilities that are more liquid than their primary assets and eliminating or reducing the need for self-

financing of investments (Ikapel, Namusonge & Sakw, 2019). When these functions are well performed, the result is most likely to be economic growth through financial system stability and then financial system efficiency. Financial efficiency can be referred to as bank's ability to generate revenue from a given amount of assets and to make profit from a given source of income. The efficiency with which this intermediation function is executed is pertinent, yet it has inherent cost implications. The costs of financial intermediation, measured by interest rate spread or the difference between lending rate and deposit rate, are important in determining Efficiency of financial intermediation (EFI).

The efficiency of financial intermediation is measured by interest rate spread. It is the interest rate charged by Financial Institutions (FIs) on loans granted to customers, less the interest rate paid by the FI for the demand, time or savings deposits in their possession. EFI is related to transaction cost (cost of loanable funds, operating expense, overhead), lending rate and profitability.

When transaction cost is high, FIs are tempted to increase the interest rates on loans granted to enable it to make a spread, stay profitable and be efficient. When borrowing rates are high, FIs encourages deposit mobilization to acquire needed funds to lend out. However, an increase in borrowing rate may lead to decline in borrowing activity then a decline in the EFI which could in turn affect the financial institution's profitability. Furthermore, when lending rates are low, they tend to induce investment in an economy leading to growth and development. However, a lower lending rate will also reduce profitability of the FI which in turns reduces the EFI.

The use of all available resources to finance banks' assets is known as financial structure. There are several funding sources available to banks, which include savings deposit, term deposits, certificate of deposits, interbank market, Eurodollar market, equity and debt finance. When banks source funds from short- and long-term sources, they incur cost in the process, and these costs usually manifest themselves in the form of incurred interest charges. The more banks use high interest funds, the more interest will be charged on loans (Sheriff & Amoako, 2014). When high cost is attached to the financial structure, the lesser the ability to create more loans, make spreads or profit and be efficient.

The efficiency with which bank operating income is generated from the traditional intermediation activities and non-

intermediation activities; net interest income and non-interest income is essential because these incomes form large part of profitability posted by the FI which could be used for expansion that has numerous benefits to the economy. An efficient financial intermediary implies that the institution remains relevant and a going concern. With this more jobs are created with its related positivity to the economy. Therefore, it is important that transaction cost is low to enable the FIs apply proper pricing to loanable funds, make loans and advances attractive and affordable, then generate more loans and advances while making adequate spread to cater for the low transaction cost and profit to be made. It is noteworthy that bank executives since Nigerian banks consolidation in 2005 ensure that the institutions they are managing are making profits, since a loss-making entity will eventually deplete its capital base and put the jobs of the managers at risk.

The core function of banks is the mobilization of idle funds - savings of the surplus units for onward lending to the deficit units, thus solving most of the problems standing between the lender and the borrower. However, when these banks get shortfall of funds from traditional deposit sources, they resort to money market and interbank options (Ndugbu, Duruechi & Ojiegbe, 2016). The need to meet up with customers' demands for loans exposes the bank to the higher prevailing rate at the time these funds are sourced. When the rate is low, banks will also apply a relatively lower rate to loanable fund and make adequate spread to cater for cost of fund, transaction cost and profit and vice versa, which may lead to banks transferring high cost of acquiring liquidity to borrowers who end up paying more on loans while keeping deposit rate constant. Money market usually exposes banks to higher borrowing costs due to the urgency of it (Miskin, 2001). Do these fluctuations in cost of loanable funds affect the efficiency of financial intermediation? Should banks be concerned about the inconsistency in the pricing of financial structure?

There are two conflicting school of thought on the effect of Financial Structure on EFI. The Market power hypothesis suggests that banks that have a large share of the market can exert market power by applying higher spread (which is lower deposit rates and higher loan rates) to their clients and in turn achieve higher profitability. Therefore, the wider the FS and availability of funds to a financial institution as a result of large market share, the more profitable and efficient the financial institution will be. Although high interest rate on loans increases the cost of

investors and low interest rate on deposits would cause reduction in depositing. Hence, high interest rate spread can be indicative of inefficiency in the banking system (Saunders & Schumacher, 2000). In another perspective, the loanable fund theory posits that the interest rate is determined by the demand for and supply of loanable funds. Loanable funds according to Khandker and Khandker (2008) consist of savings, investments and bond. This implies that interest is the price that equates the demand for loanable funds with the supply for loanable funds, and when equilibrium (in this case efficiency), does not hold, the situation is information asymmetry and by implication inefficiency in financial intermediation.

Several empirical studies like that of Muchiri, Muturi and Ngumi, (2016); Ndugbu, Duruechi and Ojiegbe (2016); Christi, Ali and Sangmi (2013); Ikapel, Namusonge and Sakw (2019) have been done on the effect of financial structure on firm performance, however this study would investigate the impact of financial structure on the efficiency of financial intermediation in Nigeria. Furthermore, where studies like that of Anarfo (2015); Aremu, Ekpo and Mustapha (2013); Mujahid, Zuberi, Rafiq Sameen and Shakoor (2014); Nwude and Anyalechi (2018); have used only long term funding sources like debt and equity financing, this study will investigate the effect of the entire source of funding available to the FI, which includes short and long term funds. Hence, this study will investigate the effect of financial structure on the efficiency of financial intermediation in Nigeria.

LITERATURE REVIEW

Financial structure refers to how a firm finances its assets with all its available resources (Moyer, McGuigan & Kretlow, 1999). Banks are financial institutions that are statutorily mandated to accept deposits and channeling those deposits into lending activities, either directly or through capital markets (Mwamtambulo & Ntulo, 2018).

In practice, customer deposits are not the only source of funds that finance the intermediation functions of banks. There are several funding sources available to banks, which include interbank market (Anake, Obim, & Eke, 2014), and equity and debt finance (Teker, Tasseven & Takel, 2009). This view was affirmed by Olafia (2018) when he availed that the major sources of long-term funds are capital, shares and debentures (capital structure), and short- term funds are obtained deposits and money market funds as alternatives to borrowing. All this

form the structure of bank funding, commonly referred to as financial structure (Anake, Obim & Awara, 2014).

Long Term Funds

According to Anake, Obim and Awara (2014), long term funds is a combination of debt and equity. In same way, Pandey (2000) availed that it is the mix of long-term sources of funds, such as debentures, long-term debts, preference share capital and equity share capital including reserves and surpluses (i.e. retained earnings). Long-term funding involves financing over a year through loans, debt, leases, or bonds, typically for large projects and company expansion, aiming to generate future synergies for institutions. There are various sources of long-term funds such as equity capital, preference capital, debentures, term loans and retained earnings.

Short Term Funds

Short term fund is divided in to demand deposit funds and money market funds. Demand or current deposits or cash deposits are used by industry and traders to settle debts and cheques issued by them against the accounts kept with the bank. Demand deposits formed a high level of aggregate liabilities in the banking sector. Time deposits consist of savings accounts and term or fixed deposits with maturity varying from 14 days to 10 years (Machiraju, 2008). Savings accounts are used by households to deposit income and settle obligations through cheques.

The most common of money market funds include certificates of deposit and interbank market funds. According to Howells and Bain (2007:129), the inter-bank market is a market through which banks lend to each other. In this sense, the inter-bank market is the major window where banks explore in the money market in short term, for meeting of its financial obligations. The inter-bank market offers banks a source of surplus funds and borrowing when reserves are low, similar to the discount market. It provides lending and borrowing facilities, enabling banks with surplus funds to borrow and those with shortages to access these facilities.

Monetary Policy Rate (MPR)

Monetary policy is a nation's monetary authority's approach to control short-term borrowing rates and money supply, aiming to reduce inflation and maintain price stability. It involves modifying money supply through printing more or decreasing it through interest rate changes or excess reserves. The Monetary Policy Rate (MPR) itself, is a tool used in the implementation of any of the monetary policy the Central bank decides to adopt. Marcel (2022) describes it as the

interest rate at which CBN lends to commercial banks; it therefore serves as benchmark against which other lending rates in the economy are pegged. A raised MPR signals to commercial banks to accordingly hike their interest rates on loans and advances to their customers, and vice versa. The MPR therefore is a key monetary policy instrument, and its alteration (or manipulation) is usually targeted at influencing some macroeconomic variables, including rate of inflation.

Financial Efficiency

According to Drucker (1963), efficiency can be defined as the ability of an organization to achieve its output from the minimum input level. In other words, Efficiency is defined as the measure of effectiveness that produces the minimum waste of time, effort, and skill. According to Jouadi and Zorgui (2014), efficiency summarizes the idea to produce with the best manner, which means the optimized use of resources to generate the best products with the minimum costs is the concept of efficiency.

Financial efficiency is how well the money invested produce revenues to the investor or the organization. It refers to the meeting of necessary requirements (elimination of market distortions, competitive markets, accessible information, etc.) for the provision of highest quality financial services at the lowest cost possible (Ozlem, Hasan, & Umit 2014). Just like efficiency, financial efficiency can also be described as the capability of financial markets to provide high quality financial products at minimal cost (Nyamweya & Ochieng, 2018). Financial efficiency refers to a bank's ability to efficiently use resources to achieve set goals, determine interest rate charges and generate gross income from their assets.

To determine what constitute the financial efficiency of banks, it is most expedient to first decide on the approaches to banking efficiency. There are two main approaches that are widely used in the banking theory literature, namely, production/micro-based and intermediation/macro-based approaches.

Berger and Humphrey (1997) argues that neither of these two approaches is perfect because they cannot fully capture the dual role of financial institutions as providers of transactions/document processing services and also being financial intermediaries. They point out that the production approach may be somewhat better for evaluating the efficiencies of bank branches, and the intermediation approach may be more appropriate for evaluating financial

institutions as a whole. At this point, it is important to state that the intermediation/macro-based financial efficiency is the focus of this study. Efficient financial intermediaries allow the mobilization of savings from various sources and the allocation of credits to more productive activities, that benefits not just the direct investors and beneficiaries of the investments but the whole economy (Gulde, Patillo & Christensen, 2007).

Banks financial intermediation functions arise because of information asymmetry and transaction costs between agents (Ngugi, 2001). Efficient financial systems will likely lead to reduced incidence of information asymmetry and transactions costs. For transaction costs, elements of financial intermediation costs include cost of operations, loan loss provision, taxes, net profits and other intermediation costs (Nyamweya & Ochieng, 2018).

Efficient financial system is the reflection of how investors have processed information available to them (Bazot, 2018). In same way, Nyamweya and Ochieng (2018) asserted that the quantitative proxies for evaluating the efficiency of a financial system may include, (i) total costs of financial intermediation to total assets ratio, as well as (ii) spread of interest rate given by the deference between lending and deposit rates. Of the two, due to data availability issues, interest rate spread has commonly been used in literature.

Interest Rate Spread or Margin is the cost of borrowing money. In simple terms, an interest rate is rate charged by a lender of money or credit to a borrower. From the borrower's point of view, it is the 'cost' of borrowing, and from the financial intermediary's point of view it is the reward for lending. When a loan or credit is made the financial intermediary loses 'liquidity', and the rate of interest is the compensation for parting with liquidity and losing the ability to allocate funds to other persons or purposes.

Conventionally, banks exist because they directly reflect the costliness of information. This they do by specializing in the screening of the credit worthiness of borrowers and continuous monitoring of the execution of such loans by borrowers (Were & Wambua, 2014). However, since the receipts for deposits and loans are not synchronized, intermediaries like banks incur certain costs, and these costs for intermediation services together with market uncertainty, determine the interest rate levels for deposits and loans (Ngugi, 2001). The profit or the reward that banks and other financial institutions get from

offering these financial services is the spread between lending and deposit rates. This difference also defines cost of intermediation, or a proxy of the efficiency of intermediation process (Ngugi, 2001; Nwanne, 2015).

Long Term-Funds and Efficiency

Abd, Nirwana, Iksan and Akbar (2020) discussed empirical evidence of monetary policy's impact on national economic growth between 2010-2019. The study using a regression analysis tool concluded that (1) Monetary Policy Interest Rate has an impact rate on national economic growth in Indonesia in the decade 2010-2019 of only 7 percent. (2) Impact of US $ exchange rate on the domestic economic growth of only 90 percent (3) Impact of the amount of money in circulation on the national economic growth of only 76.8 percent, (4) Impact of inflation rate on the domestic economic growth of only 4.3 percent (5) impact of total investment in national economic growth is only 60.8 percent. Thus, the main objective of monetary policy is more emphasis on price stability and price stability can encourage creating a better economic climate because it will reduce costs from inflation. This study shows the importance of Monetary Policy Interest rate to economic growth however it did not show this in relationship with financial institutions and their level of profitability which this present work intends to handle.

Nelson, Johnny, Peter and Ayunku (2019) investigated the relationship between long term funds and firm performance in the micro-finance banking sub-sector in Nigeria from 2009 to 2018. The study employed long term funds variables like debt to equity ratio, long term debt ratio and total debt ratio representing capital structure and the explanatory variable (return on equity) representing firm performance. The study used Descriptive statistics and regression technique for analysis and the results revealed a negative and insignificant relationship between Debt to equity ratio and return on equity, a positive and insignificant relationship between Long term debt ratio and return on equity and a positive and significant relationship between Total debt ratio and return on equity, and recommended that micro-finance banks in Nigeria and beyond should devise strategies that are effective to expand their debt profile in order to achieve better performance.

This study, however, will be looking at the combination of both long term and short-term funds and its effect on how efficient financial institutions are in the course of carrying out their expected function.

Muchiri, Muturi and Ngumi (2016) investigated the relationship between financial structure and financial performance of listed firms at the East Africa Securities Exchanges. The study used econometric modelling techniques for panel data analysis: Feasible Generalized Least Squares method, random effect and fixed effect based on Hausman specification test. The study found out that in isolation, short term debt, long term debt, retained earnings and external equity had insignificant negative relationship with return on assets but insignificant positive relationship with return on equity. While combined, financial structure had a significant positive and negative relationship with return on equity and return on assets respectively. This study is correct to identify long-term funding sources but it will be extended to include short-term funds and their impact on the efficiency in financial intermediation.

Amjed (2011) explored the impact of debt financing on the profitability of the firms in Chemical Sector of Pakistan. Data consists of all chemical companies listed on the Karachi Stock Exchange during the period 2001 to 2006. The Ordinary Least Squares (OLS) was employed to test the hypothesized relationship. Major source of debt financing for Pakistani companies is various types of loans with different maturities. The findings of the study reveal significant negative relationship between long term Debt and firms' performance and significant positive relationship between short term debt and the profitability. As applicable as this study is to this study, it failed to empirically consider the effect of bank financial structure on interest rate spread/efficiency in financial intermediation.

Stephen and Gang (2019) carried out a study in other to answer questions surrounding the use of long-term debt access and its effects on firm's growth, evidencing China. By using data from the National Statistical bureau of China and other field survey with a consideration of various firm sizes in the course of data collection, and the employment of Statistical package of social studies version 22 which was used to analyze the data after applying correlating as well as regression model, it was discovered that, long term debt negatively affects firm growth when sizes and maturity remain major considerate option to access long term finance, though not statistically significant as perceived. Again, this study was limited to long term debt, not considering short term forms of debt which the researcher intends to go beyond. Also, this study was limited to looking at the maturity time of these debt vis a vis growth of the firm while the ongoing study will be looking at the

efficiency of the institution in relationship to both long term and short term funding.

The study by Ghasemi and Rostami (2015) was carried out to consider affecting factors on spread rate and define a suitable model of spread rate in banking industry. Data used for the study was gathered from annual financial reports of an Iranian bank during 19 months from September 2014 up to March 2015. Variables such as NPL ratio, ratio of demand deposits on deposits, non interest income, and interest assets to assets, capital adequacy ratio, ROA ratio and inflation and exchange rate are analyzed on spread rate and a model is defined for bank according to prior studies and economical issues of Iran. Findings show that there is positive relationship between the ratio of low-cost deposits, Non-performing loan and return of assets had positive impact on interest rate spreads, while negative relationship exist between non-interest income, Income-earning assets, high capital adequacy and exchange rate exhibited negative impact on interest rate spreads. Again, this study only identified deposit ratio as a source of funding, while neglecting money market funds as well as capital funds.

Omoruyi and Osagie (2015) empirically examined the macroeconomic determinants of interest rate spread in Nigerian banking sector using annual time series data for the period 1981 to 2012. The study adopted a multivariate OLS analysis for the estimation process, cointegration analysis for long-run equilibrium relationship and the associated error correction model to determine the short-run impact of the variables. The Granger causality test was used to determine the direction of causality among the variables. The findings of the study were that cash reserve ratio and non-performing loans are significant determinants of interest rate spread in Nigerian banking sector; that bidirectional causality exist between financial development (M2/GDP) and interest rate spread while a unidirectional causality was found running from minimum rediscount rate to interest rate spread. The scope of macroeconomic factors are important but not completely exhaustive as funding sources are equally important in determining the efficiency in financial intermediation.

Theoretical Framework

The Bank Dealership Model

This study is anchored on the Dealership Model of Ho and Saunders (1981) which proposed a micro-economic model that aims to explain the equilibrium scale of the bank, the composition of its asset and liability

portfolios, and the interest rates it applies on loans and deposits are determined endogenously. They modelled each side of the bank's balance sheet separately and justified the existence of interest margin by the addition of the monopoly power of the bank, the marginal cost of deposits, and the marginal cost of loans. Knowing that a bank can use its margin on loans (or deposits) to cross-subsidize its interest rate on deposits (or loans).

The most influential theoretical model of determination of interest margins is the bank dealership model by Ho and Saunders (1981), in which the size of bank interest margins is explained on the basis of the uncertainties associated with deposit and loan markets, hedging behaviour and expected utility maximization. Banks are assumed to be risk-averse financial intermediaries, facing inventory risk due to random deposits and stochastic loan requests which has to be satisfied. This uncertainty implies that banks have to be compensated through a pure interest spread, which is a spread between loan and deposit rates.

The dealership model was extended by many researchers and some of the assumptions made by Ho and Saunders were relaxed to take into consideration various types of loans. All together with the original dealership model, these new models constitute the bedrock on which many empirical studies were built. Those empirical studies revealed a multitude of factors covering the macro and microeconomic determinants of banking spread in different environments.

METHODOLOGY

The research design adopted in this study falls within the paradigm of an Ex-post facto design type. The reason is that the events observed, in this case financial intermediation efficiency as affected by some financial structure in the banking sector in Nigeria, have already taken place (Ojong *et al*, 2014). The population of the study is all the financial institution whose data in respect to their capital base, total customer deposit activities and their activities in the money market are captured in the Central bank of Nigeria (CBN) statistical bulletin.

No specific sampling technique was used in selecting of financial institutions used in this study. Rather an aggregate data of institutions relevant to this study as provided by the CBN and contained in their published statistical bulletin covering the period of 40 years (1981 to 2020) was used for this study. This study relied mainly on secondary data. The

secondary data involve were carefully collected from the World Bank data base and Central Bank of Nigeria (CBN) statistical bulletin. Again, to achieve the stated objectives of this study, annual time series data for the period 1981-2020 were sourced and used.

The dynamic Autoregressive Distributed Lag (ARDL) (p, q^1,q^2,q^3) single estimation model will be estimated in the course of this study, using the ARDL method following Pesaran et. al (2001) with the aid of E-Views 10 econometric software. The model will be tested under the standard assumptions of zero mean of the error, zero covariance assumption between the explanatory variable and the error term and the homoscedastic variance of the error term. For Pre-diagnostic test, the study will perform the unit root test for stationarity of the series while the post diagnostic test that will be performed include the Homoscedasticity test, autocorrelation test normality test and ARDL Bounds Cointegration Test.

The Model is specified in functional form as:

$FIE_t = f(KFt, CDFt)$…….(1)

Where;

FIE_t = Financial Intermediation Efficiency at time t.

KF_t = Aggregate Capital Fund at time t.

CDF_t = Aggregate Consumer Deposit Fund at time t.

Transforming equation 1 into a dynamic ARDL(p,q^1, q^2, q^3) econometric model yields:

$$FIE_t = \delta_0 + \sum_{i=1}^{p} \alpha i FIE_{t-i} + \sum_{j=1}^{q1} \beta_j KF_{t-j} + \sum_{k=1}^{q2} \omega_k MMF_{t-k} + \sum_{l=1}^{q4} \theta_l MPR_{t-l} + \sum_{m=1}^{q5} CDF_{t-m} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Variables	**Measures**
Financial Intermediation Efficiency	$\boldsymbol{lr - dr,}$ where *lr* is average lending rate, and *dr* is average deposit rate

Capital Funds (KF)	$\left(\frac{\textbf{Total Shareholders' Equity}}{\textbf{Total Assets}}\right)\textbf{100\%}$
Money Market Funds to Banks (MMFB)	$\left(\frac{\textbf{Certificate of deposits + Term deposits + Discount window +}}{\textbf{Total Assets}}\right.$
Deposit-To-Assets Ratio (DR)	$\left(\frac{\textbf{Demand deposits + Savings deposits}}{\textbf{Total Assets}}\right)\textbf{100\%}$
Monetary Policy Rate (MPR).	**Determined by the Central Bank of Nigeria**

DATA ANALYSIS AND RESULT

Table 1: Summary Statistics of the Variables

	FIE	KF	CDF	MMF	MPR
Mean	10.32231	10.03308	45.12897	6.128974	13.07692
Median	12.8	10.82	44.55	5.87	13.5
Maximum	20.7	21.05	54.99	12.16	26
Minimum	-0.25	1.49	37.88	0.65	6
Std. Dev.	5.491133	5.779952	4.025114	3.562461	4.046666

Source: Researcher

Table 1 shows the summary statistics of the data used in the analysis. It presents the mean, median, maximum and minimum values and standard deviation for the variables used in this study. FIE is used to capture the level of financial intermediation efficiency in the banking sector, while KF, CDF, MMF and MPR all represents Capital Funds, Deposit Funds, Funds from Money Market and Monetary Policy Rate. The mean values of FIE, Capital Fund (KF), Consumer Deposit Fund (CDF), Money Market Fund (MMF) and Monetary Policy Rate (MPR) are 10.32, 10.03, 45.13, 6.13 and 13.08 respectively. The variability in the dataset which is measured by the standard deviation shows that Capital Fund (KF) has the highest variability with a value of 5.78 while Money Market Fund (MMF) has the lowest variability with a standard deviation of 3.56.

Table 2: Unit Root Test Results

Variable	t-statistic	ADF 5% Critical Values	p-value	Remark
FIE	-7.165547	-2.943427	0.0000	I(1)
KF	-5.894811	-2.943427	0.0000	I(1)
CDF	-8.839104	-2.943427	0.0000	I(1)
MMF	-5.178809	-2.943427	0.0001	I(1)

*p<0.05

Source: Researcher

The table 2 show the result of stationarity tests that was performed to show the Augmented Dickey-Fuller (ADF) unit root test result for the variables used in the study. It highlights the order of integration in all the variables. The results show that the p-value of the statistic is less than 0.05 meaning that the four variables are stationary at 5% significance level (integrated of order one 1(1)) respectively.

Table 3: ARDL Bounds Co-Integration Test Results

F-statistic	UPPER BOUND	LOWER BOUND	Remark
4.5877	2.56	3.49	Cointegrated

*p<0.05 *p<0.1

Source: Researcher

The table 3 shows the ARDL Bounds testing for Cointegration. From the result above, the computed F-statistic is 4.5877 which is greater than the lower bound value of 2.56 suggesting that the null of hypothesis of no cointegrating relationship is rejected. Thus there is cointegration in the ARDL model.

Table 4: Regression Output for The ECM Model

Dependent Variable; DFIE

Variable	Coefficient	Probability Values
D(FIE(-1))	-0.0796	0.4813
DKF	0.2169	0.0241
DMMF	-0.5140	0.0125

D(MMF(-1))	0.3687	0.0987
DMPR	-0.1829	0.1175
DCDF	0.3120	0.0069
DCDF(-1)	-0.3806	0.0033
ECM001	-0.9640	0.0000
C	0.2576	0.4114
R-squared	0.799976	
Adjusted R-squared	0.751695	
S.E. of regression	1.868648	

*p<0.05 **p<0.1

Source: Researcher

The above table 4 the regression output for the Error Correction Model. The variables in differenced form (DKF DMMF, DMPR DCDF) represent the shortrun relationship while the ECM001 captures the speed of adjustment from the short run to long run equilibrium. The p-values of the coefficient shows that all variables are statistically significant at the 5% level in the short run except for the coefficient of MPR. Thus, holding other factors constant, a unit increase in the Capital fund will lead to an average rise in the efficiency of financial intermediation by 0.2169 in the short run. Also, a unit rise in Money Market funds will lead to a decrease in efficiency of financial intermediation by 0.5140 in the short run and again, an increase in Consumer Deposit Fund will lead to an average increase in the efficiency of Financial intermediation by 0.3120. The coefficient of ECM which captures the speed of adjustment is statistically significant at the 5% level suggesting that about 0.96 of the discrepancy between the short run and long run is corrected per period of time.

Table 5: Autocorrelation Test Result

ITEM	F-STATISTIC	P-VALUE	REMARK
Residual	2.4063	0.1317	No autocorrelation

Source: Researcher

The table 5 shows the Breusch-Godfrey LM Correlation test for autocorrelation. The p-value of the F-statistic is 0.1317 which is greater than 0.05 suggesting that the residuals are not autocorrelated.

Discussion of Findings

The results of our empirical analysis regarding the effect of financial structure on the efficiency of financial intermediation in Nigeria is provided below;

The study shows that a unit rise in capital fund will raise the efficiency of financial intermediation in the long run. Therefore, the impact of aggregate capital funds on the efficiency of financial intermediation is seen to be positively significant in Nigeria. Muchiri, Muturi and Ngumi (2016) had previously found that equity capital has insignificant impact on bank performance in isolation but significant when considered with short-term funds. This study however identified long-term and short-term funding sources and extended to their impact on the efficiency in financial intermediation. Their finding is variance with that of this study, since we combined it with short term funds, using deposit fund as control variable.

It is expected that adequate capital aids banks carry out their operation efficiently however, despite recent recapitalization reforms in Nigeria's banking sector, capital remains inadequate, limiting efficiency. This suggests that there may be no limit to the capital a financial institution should have to achieve efficiency.

For money market funds, the study reflects that a unit increase in further accessing of money market funds leads to a decrease in the efficiency of financial intermediation, implying that impact of aggregate funds from money market facilities on the efficiency of financial intermediation is negatively significant though relevant to efficiency of financial intermediation only in the short run. This finding is in contrast with Amjed (2011) but agrees with Muchiri, Muturi and Ngumi (2016). The result of this study also reveals why profitable banks prefer to employ internally generated funds that is deposit funds rather than money market funds for short term debt financing. According to Nwosu and Hamman (2008), the existence of money markets facilitates trading in short-term debt instruments to meet short-term needs of large users of funds such as government, banks and similar institutions. It means we cannot over emphasize the importance of money market funds as a short term means of meeting pressing financial obligations. However, the study has shown that it might not be economically wise to rely significantly on it and will not lead to efficiency of the financial intermediation function in the long run because its effect is negative.

For monetary policy rate, result of the regression shows that MPR is not statistically significant and relevant to efficiency in financial intermediation, implying that the impact of monetary policy rate to efficiency in financial intermediation has no statistical evidence. MPR is only a tool for apex bank monetary policy regulations and does not statistically impact on efficiency of the FI in the long run, especially when it is increased.

CONCLUSION

The study examined the effect of financial structure on the efficiency of financial intermediation in the Nigerian banking sector from 1981 to 2020. The study concludes that while long-term funds (Capital fund) had significant impact on efficiency of financial intermediation in Nigeria, short term funds (money market facilities and MPR) does not. The study also concludes that MPR is not statistically significant to efficiency of financial intermediation. These findings align with previous empirical studies.

Following the results reported in the preceding section, the following recommendations are made.

i. Since capital funds has positive significant impact on the efficiency of financial intermediation, banks with dwindling capital bases should be quickly rescued by the apex bank or be instructed to increase their capital base to maintain efficiency. Also, there is a need to start the discuss on increasing of banks' capital base in Nigeria since some banks are already showing signs of dwindling capital base.

ii. On money market, this study proposes that in as much as banks may need to have credit lines opened in other banks for meeting of short-term obligations, in the long run there is a need to make every effort to stay away from borrowings in other banks. Rather efforts should be directed towards mobilization of cheaper savings and demand deposits that can be used for the same purpose.

iii. And for Monetary Policy Rate, the apex bank must maintain the lowest monetary policy rate to encourage financial institutions to lower deposit prices, thereby enhancing borrowing which leads to profitability as the spread between institution and borrower costs determines this, and in turn efficiency of the financial intermediation.

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