

Profitability and Liquidity Management of Deposit Money Banks in Nigeria.

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ABSTRACT

The banking industry in Nigeria is quite competitive and the number of players in the Banking industry is relatively large. This makes the firms in the sector to continually create, implement, assess and improve on strategies so as to increase its profitability rate and have a sound liquidity management. In view of this, this study examined the profitability and liquidity management of deposit money banks in Nigeria using data for the period 1991 to 2020 and the Autoregressive Distributed Lag (ARDL) bounds testing approach. The study made use of Returns on assets and returns on equity as the dependent variable, interest rate, inflation rate, minimum rediscount rate, liquidity ratio, cash reserve ratio, and monetary policy rate as independent variables. The results indicated that profitability as a result of returns on assets and returns on equity is stable. It also shows that the coefficient of the intercept is positively signed and statistically significant and a unit increase in returns on assets and returns on equity variables would lead to a 14.01273 increase in the bank profitability. Furthermore, all the variables are also statistically significant with INT, CRR, MDR, LR, and MPR having a positive relationship with returns on assets and returns on equity while INF have negative relationship. Based on the results obtained, the study recommended that more areas of reforms that will help qualify more Nigerian banks for profitability should be given adequate attention

Keywords: Profitability, Liquidity management, Deposit money Banks, Economic growth.

JEL Classification: E4, F43, G21, O4.

Contribution / Originality: The study uniquely employs the Autoregressive Distributed Lag (ARDL) bounds testing approach (1991-2020), to examine profitability and liquidity management of deposit money banks in Nigeria. The study made use of Returns on assets and returns on equity as the dependent variable, interest rate, inflation rate, minimum rediscount rate, liquidity ratio, cash reserve ratio, and monetary policy rate as independent variables. The results indicated that profitability as a result of returns on assets and returns on equity is stable.

INTRODUCTION

The unique role of banks as engine of growth in any economy has been widely acknowledged. Banks occupy central position in the country's financial system and are essential agents in the development process. The intermediation role of banks can be said to be a catalyst for economic growth as investment funds are mobilized from the surplus units in the economy and made available to the deficit units. By intermediating between the surplus and deficit units within an economy, banks mobilize and facilitate efficient allocation of national savings, thereby increasing the quantum of investments and hence national output. Banks as financial intermediaries provide avenue for people to save incomes not expended on consumption. It is from the savings accumulated that they extended credit facilities to the entire economy through savings and investment. To perform their role effectively deposit money banks (DMBs) have to be adequately liquid. This implies that the survival of deposit money banks depends largely on its liquidity, because illiquidity being a sign of imminent distress can easily erode the confidence of the public in the banking sector hence sound liquidity is inevitable.

It is for this reason; governments of countries through their apex bank and other relevant authorities formulate reform policies and programme for banking industry (Olagunju, Adeyanju, & Olabode 2011).

Liquidity and Profitability can be likened to two central forces with contradictory objectives which at all times threaten to pull the bank apart. Practically, profitability and liquidity can be used as objective indicators of not only commercial banks, but all profit-oriented organizations, (Eljelly, 2004). The shareholders are interested in the profitability of banks because it determines their returns on investment, Depositors are concerned with the liquidity position of their banks because it determines the ability to respond to their withdrawal needs. The tax authorities are interested in the profitability of the banks in order to determine the appropriate tax obligation, (Adebayo, Adeyanju & Olabode 2011).

The intervention of Government in the banking sector to resolve distress crises led to the various reform programme and policies. Such as the Banking Act of 1969 and the establishment of Nigeria Deposit Insurance Corporation (NDIC) in 1988 and liberalization policy in 1986 which re-introduced banks with foreign equity. Systematic distress resurfaced in the Nigerian banking industry again between 1989 and 1998 leading to a number of distress syndromes. The alarming rate of distress scourge in the banking sector between 1997 and 2003 gave birth to the banking sector reform of July 6, 2004 of which consolidation is one of the 13-point reform agenda (Hamman, 2004). The Central Bank of Nigeria requested all deposit banks to raise their minimum capital base from about US\$15 million to US\$192 million by the end of 2005. In the process of meeting the new capital requirements, banks raised the equivalent of about \$3 billion from domestic capital markets and attracted about \$652 million of FDI into the Nigerian banking sector.

Despite the various policy efforts and the attempts to improve the performance of deposit money banks in Nigeria, a look at the banking industry still showed that the industry return on equity declined from 27.35% in 2004 to 10.6% in 2006, while return on asset declined from 3.12% to 1.61 within the same period. Non-performing credits grew from N316 billion in 2004 to N357 billion in 2005 representing an average of N337 billion in the pre consolidation era. In the post-consolidation era, it was N222 billion in 2006, N388 billion in 2007, N464 billion in 2008 and N620 billion in 2009 (Okafor 2012). By 2012, Industry equity capital decreased by 14.45% from N220.21 billion in December 2011 to N188.39 billion in 2012. Then reserves decreased marginally by 2.21% from N2, 266 billion in 2011 to N2, 216 billion in 2012. The industry total loans stood at N8.15 trillion in 2012, an increase of 12.10% over the N7.27 trillion reported in 2011. The industry recorded a profit-before-tax of N525.34 billion in 2012, representing a significant improvement over the loss of N6.71 billion reported in

2011. Non-interest income on the other hand dropped by 31.92% from N845.66 billion to N575.75 billion (NDIC annual report, 2012).

In addition, only 10 banks were declared sound, 63 satisfactory, 8 marginal and 9 unsound in 2001. However, in 2002, there was an improvement. The number of sound banks was 13, the satisfactory banks were 54, marginal were 13 and unsound were 10. The sound banks reduced to 11, the satisfactory banks were 53, and marginal were 14 and the unsound banks reduced to 9 in 2003. After the consolidation specifically in 2006 and 2007, the Sound banks were 4, Satisfactory 17, Marginal 2, and Unsound 1 (NDIC annual report, 2011). The total credit was N2, 840.10 billion and N5, 250 billion respectively in 2006 and 2007. Also, the banks' Non performing credit was N225.08 billion and N387.99 billion; ratio of non-performing credit to shareholders' funds was 22.5 and 23.98; and Profit before tax was N181.04 billion and N397.75 billion. The banks' non-performing credits to total credit ratio was as high as 88.35% with an average capital to risk weighted assets ratio of 11.74% (Cowry Research Desk, 2009).

It was further revealed that there was a quantum leap in the proportion of Reserves to total liabilities as it increased from 0.96% in 2010 to 10.35% in 2011. Total assets increased by 17.31% from N18.66 trillion in 2010 to N21.89 trillion in 2011. In 2012, all the banks, except one met the stipulated minimum capital adequacy ratio (CAR) of 10.0% and industry liquidity ratio at an average of 63.9% against the prescribed minimum of 30.0%. The asset quality of banks improved substantially as it declined to 3.47% at 2012 which was below the threshold of 5.0% (NDIC annual report, 2011).

The paper is structured into five sections. After this introductory section, section two reviews related literature. The methodology is discussed in the third section. Section four comprises results and discussion of findings, and finally, section five draws' conclusions based on the findings and recommends the way forward.

THEORETICAL FRAMEWORK AND EMPIRICAL LITERATURE REVIEW

Concept of Profitability

Profitability is ability of a company to use its resources to generate revenues in excess of its expenses. In other words, this is a company's capability of generating profits from its operations. Aburime (2008), profit means the difference between the revenue generated from sale of output and full opportunity cost of factors used in the production of that output. While Isomocos (2003), saw profitability as the ability of a bank to generate income which surpasses its liabilities. The issue of profitability is a continuous issue that a bank has to consistently face. In essence, it is concerned with the level of income that must be received by a bank in order to cover operating costs and make surplus.

In the context of this study, profitability is captured by the return on Assets (ROA) and Return on Equity (ROE). ROA reflects the ability of bank assets to generate profit whereas ROE indicates the returns to shareholders on their equity and equals. ROA times the total assets-to-equity ratio.

Concept of Liquidity management

Liquidity management refers to the planning and control necessary to ensure that the organization maintains enough liquid assets either as an obligation to the customers of the organization so as to meet some obligations incidental to survival of the business or as a measure to adhere to the monetary policies of the central bank.

Liquidity management defined by Central banks as the framework, set of instruments, and the rules that the monetary authority follows in managing systemic liquidity, consistent with the ultimate goals of monetary policy (Bhattacharyya & Sahoo, 2011). In this study, liquidity management refers to policy guidelines by the CBN to ensure, maintain and sustain adequate liquidity level in deposit money banks. The foregoing definitions reveal that liquidity ratio (LQ), loan-to-deposit ratio (LD), cash reserve ratio (CRR), and monetary policy rate (MPR) are classified as indicators of liquidity management.

Theoretical framework

The Shiftability theory

The shiftability theory of bank liquidity was propounded by H.G. Moulton in 1918 who asserted that if the commercial banks maintain a substantial amount of assets that can be shifted on to the other banks for cash without material loss in case of necessity, then there is no need to rely on maturities. This theory posits that a bank's liquidity is maintained if it holds assets that could be shifted or sold to other lenders or investors for cash. This point of view contends that a bank's liquidity could be enhanced if it always has assets to sell and provided the Central Bank and the discount Market stands ready to purchase the asset offered for discount. Thus this theory recognizes and contends that shiftability, marketability or transferability of a bank's assets is a basis for ensuring liquidity. According to this view, an asset to be perfectly shiftable it must be immediately transferable without capital loss when the need for liquidity arises. This is particularly applicable to short-term market investments such as treasury bills and bill of exchange which can be immediately sold whenever it is necessary to raise funds by banks. But in a general crisis when all banks are in need of liquidity, the shiftability theory requires that all banks should possess such assets which can be shifted on to the central bank which is the lender of the last resort. However, the shiftability theory has the following weaknesses;

1. Mere shiftability of assets does not provide liquidity to the banking system. It entirely depends upon the economic circumstances.
2. A single bank may have shiftable assets in sufficient quantities but if it tries to sell them when there is a run on the bank, it may adversely affect the entire banking system.
3. If all the banks simultaneously start shifting their assets, it would have disastrous effects on both the lenders and borrowers.

Empirical Literature Review

Returns on Assets of deposits money banks

Ogunleye (2020) examined the effect of interest rate policy on the profitability of financial institutions in developing economies, using time series data from Nigeria between 1990 and 2018. Employing an autoregressive distributed lag (ARDL) model, the study found that the monetary policy rate (MPR) and lending rate exerted a positive and significant impact on banks' return on assets (ROA) and return on equity (ROE). The study concluded that moderate monetary tightening enhances banks' profitability by widening interest margins and improving resource allocation efficiency.

Samuel and Ijeoma (2021) investigated the relationship between interest rate spread and bank profitability in Nigeria from 1995 to 2019, using panel data from ten commercial banks and a fixed-effects model. The results revealed that a wider interest rate spread significantly improved banks' ROA and ROE, indicating that higher lending rates relative to deposit rates enhance profitability. The authors recommended effective interest rate management to sustain bank performance and financial stability.

Adeleke and Yusuf (2022) analyzed the influence of monetary policy instruments — including the cash reserve ratio (CRR), minimum rediscount rate (MRR), and liquidity ratio — on bank performance in Nigeria between 1990 and 2020. Using a vector error correction model (VECM), their findings showed that CRR and MRR had positive and significant long-run effects on bank profitability, suggesting that effective liquidity control strengthens banks' operational efficiency and profitability under tight monetary regimes.

Mishkin (2016), although primarily a theoretical work, provided extensive empirical evidence from developed and developing economies on how monetary policy transmission mechanisms affect bank performance through the interest rate, credit, and balance sheet channels. Mishkin's findings emphasized that the interest rate channel

remains the most direct means through which monetary policy adjustments influence bank profitability and overall financial stability.

The study by Darush Yazdanfar, Peter Öhman (2016), examined the impact of trade credit as a funding source on profitability among small and medium-sized enterprises (SMEs) in Sweden. A large cross-sectional panel data set covering 15,897 Swedish SMEs in five industry sectors from 2009 to 2012 was analyzed using several statistical techniques. The study provides empirical evidence that the use of trade credit significantly and negatively affects firm profitability, indicating that SMEs with lower accounts payable are more profitable. Furthermore, liquidity level and firm size are positively related to profitability, while firm age is negatively related to profitability.

While Olalere, Ahmad, and Kamil (2017), examined the bank-specific and macroeconomic determinants of banks profitability in Nigeria analyzing audited financial reports of selected sixteen (16) commercial banks over the period of 2010 to 2015 making up to 96 observations. The study identified that existing studies are sketchy in developing economies even though many studies have emerged in developed economies. The bank profitability is measured by return on assets and return on equity as function of bank-specific and macroeconomic determinants. Using the balanced panel data set, the empirical results of the study showed that capital adequacy and liquidity have a positive and significant effect on bank profitability.

Yüksel et al. (2018) carried out research to isolate the determinants of the profitability of banks in 13 countries from the former Soviet Union. The annual data that spanned the period from 1996 to 2016 was examined by considering panel regression using GMM. The study found that the value of loan, NIM and output growth were significant factors impacting on profitability. The findings show that, the NIM and economic growth had a strong positive link with profitability. The study made recommendation that post-Soviet countries banks' need to consider means by which their banks NIM can be increased.

Muraina (2018) examined the variables that influenced profitability of DMB's in Nigeria from 2008-2016. Data for the analysis was sourced from fourteen DMB's that were quoted in the NSE. The study adopted ROA as the proxy for profitability, while the regressor variables where; capital adequacy, credit risk, and inflation. The findings from the study show that while CAD had a positive, but significant effect on profitability, credit risk had a negative significant impact on profitability.

In a similar study Almaqtari, Al-Homadi, Tabash and Farhan (2018) examined what determined commercial bank profitability in India. The analysis utilized data from a balanced panel that covered the period 2008 to 2017 for a total of 6 Indian commercial banks. In this study Indian commercial bank profitability was represented by, ROA and ROE, and size of bank, assets quality, CAD, liquidity, operating efficiency, deposits, leverage, assets management, and the numbers of branches were used as other factors that were bank specific. The summary findings show that the size of bank; the number of bank branches, ratio of assets management, operational efficiency, and leverage ratio are the major bank specific factors that influence bank profitability in India as depicted by the ROA. Factors that are considered bank specific were; bank size, assets management ratio, assets quality ratio, and liquidity ratio; which all had significant and positive effect on ROE. The inflation rate, rate of exchange, the rate of interest, and demonetization were seen to have a serious effect on ROA. The results for the ROE; the macroeconomic factors excluding demonetization all have a major effect on the on the ROE.

Yao, Harris and Tariq (2018) found that in Pakistan, bank profitability is a product of size, increased solvency, financial structure, cost of operation, productivity of labour, market power, and economic growth. The nexus linking size of banks to profitability was an inverted U-shaped. The study adopted the Herfindahl–Hirschman Index in order to measure the effect of market power and the results show a confirmation of the Structure Conduct Hypothesis. The other factors such as; quality of credit, operational efficiency, development of the banking sector, inflation, and industry concentration had a significant but negative link to bank profitability. The study also found that during transition; the profitability of banks was lower. The findings showed Pakistan's specialized banks (SB) generated bigger net interest margin (NIM) than the total number of the remaining commercial banks.

Djalilov and Piesse (2019) documented the impact of regulation on bank efficiency by utilizing system GMM via a dynamic panel regression for 21 former Eastern bloc countries spanning 2002–2014. The findings from the system GMM estimation shows that the restriction of bank activity actually improves the efficiency of banks in these countries that make up the study population. But the results from dynamic panel quantile reveal that the impact of regulation was different in the separate quantiles. The conclusion from this study provides a major policy implication as regards the impact of transition countries banking regulations.

The study by Batten and Vo (2019) did inquire into the factors that impact on bank profitability in Vietnam for the period that spanned from 2006 to 2014. The study adopted a number of econometric methods to evaluate the sourced data; the findings of the study show that, the size of the bank, capital adequacy, risks, expenses, had impact on profitability. The findings also show that the characteristics of the banking sector and the non-bank-specific variables affect bank profitability. But the direction of causal links; where similar when assessed based on profitability measures that were examined.

However, efficiency ratio has a negative and significant effect on bank profitability. With regards to macroeconomic variable, GDP growth also has a positive and significant impact on banks profitability. The empirical results of the study suggested that banks can improve their profitability through increasing capital and liquidity, decreasing operating cost with conscious effort to maintain transparency in their operations. In addition, a good economic environment for financial institutions foster increase in bank profitability.

Liquidity Ratio of deposit money banks

The study by Zelalem Borena Bono (2020) titled "Determinants of Bank Liquidity and Its Impact on Bank Profitability in Ethiopia using the wo-stage least square (2SLS) balanced panel estimation method from 2014–2019. The empirical result of the first equation of the study reveals that bank profitability, foreign exchange availability, and real GDP growth have positive significant impact on bank liquidity while net loan and advance has a negative significant impact on bank liquidity. The empirical result of the second equation depicts that bank liquidity has positive effect on bank profitability even if it is insignificant but total non-interest income and expectation have a positive significant effect on bank profitability.

The study by Helmi Hamdi, Abdelaziz Hakimi (2019), The aim of this paper was to define the optimal level of liquidity and to investigate its impact on the overall bank profitability. To achieve these goals, a large sample of 127 countries over the period 2005–2015 was used. The Panel Smooth Transition Regression (PSTR) as econometric approach was performed. Empirical results showed that the optimal level of liquidity that affects bank profitability is 24.18% for high income countries and 40.45% for low - and middle-income countries. Findings also indicated that credit risk decreases significantly at the level of profitability of the two groups of countries.

Asif Hussain Samo, Hadeeqa Murad (2019), in the study titled "Impact of liquidity and financial leverage on firm's profitability—an empirical analysis of the textile industry of Pakistan". Through quantitative approach, pooled panel regression and descriptive statistics models were used by taking annual data of Pakistan's textile sectors from 2006 to 2016. Secondary data were gathered from financial statements of the firms. The results revealed that there is a positive relationship between liquidity and profitability and negative relationship between financial leverage and profitability. The results for liquidity measuring Current Reserve revealed positive strong impact on ROA and the financial leverage measuring Debt on Equity ratio showed negative but not strong impact on ROA. The other part of result concluded that there is a positive strong impact of Current Reserve on ROE too and Debt on Equity has a negative impact on ROE.

The study by Ali. (2015) titled "The effect of liquidity management on profitability in the Jordanian commercial banks". This research seeks to investigate the effect of the liquidity management on profitability in the Jordanian commercial banks during the time period (2005–2012). The empirical results showed that there was a positive effect of the increase in the quick ratio and the investment ratio of the available funds on profitability, while there were a negative effect of the capital ratio and the liquid assets ratio on the profitability of the Jordanian commercial banks.

Mahmoud Al-Rdaydeh, Ali Matar, Odai Alghzwai (2017) analyzed the effect of credit and liquidity risks on profitability of conventional and Islamic Jordanian Banks. The paper investigated the influence of financial risks on the profitability of banks in Jordan (Islamic and conventional) for the period between 2006 and 2015. Profitability was measured in this study by return on assets (ROA) and return on equity (ROE), while the financial risks were reflected by liquidity and credit risks. The study employed panel data regression to test the hypotheses. The results illustrated a substantial influence of credit risks on both ROA and ROE for the Islamic as well as the conventional banks. The association between liquidity risk and ROE were found to be insignificant for the Islamic and conventional banks. The influence of liquidity risk on ROA was significant for the Islamic and conventional banks.

Bothale Molefe, Paul-Francois Muzinduts(2016) study analysed the effect of capital and liquidity management on profitability in five leading South African banks during the period 2004 to 2014. A co-integration panel analysis was used to test for the effect of the liquidity indicators on profitability. The empirical results showed that there is no long-run relationship between banks' profitability and liquidity and capital management. For the short-run, capital ratio was found to have significant positive effect on banks' profitability; whereas liquidity does not have an effect on banks' profitability. This study also revealed that the proxy used as measurements of profitability tends to affect the relationship between banks' profitability and liquidity and capital management. It was concluded that capital adequacy is considered to be the most effective tool to ensure the safety and soundness of South African financial institutions.

RESEARCH METHODOLOGY AND MODEL SPECIFICATION

Research design

The paper employed quasi-experimental research design. This design is used to establish the fundamental relationship between the dependent variable and the independent variables. The study also employed both descriptive and analytical methods in its analysis.

Model specification

The model for the study captures the relationship between profitability and liquidity management of deposit money banks in Nigeria. The model was anchored on the shiftability theory of bank liquidity which was propounded by H.G. Moulton (1918). This theory posits that a bank's liquidity is maintained if it holds assets that could be shifted or sold to other lenders or investors for cash. This point of view contends that a bank's liquidity could be enhanced if it always has assets to sell and provided the Central Bank and the discount Market stands ready to purchase the asset offered for discount. Thus, this theory recognizes and contends that shiftability, marketability or transferability of a bank's assets is a basis for ensuring liquidity. theory. The model is stated thus:

$$ROA = f(LR, INT, INF, MDR, CRR, MPR, ROE) \quad (3.1)$$

$$ROE = f(LR, INT, INF, MDR, CRR, MPR, ROA) \quad (3.2)$$

Where:

ROA = Returns on Assets

ROE = Returns on Equity

INT = Interest rate

INF = Inflation rate

MDR = Minimum Rediscount Rate

LR = Liquidity Ratio

CRR = Cash Reserve Ratio

MPR = Monetary Policy Rate

This is as depicted in equation 3.3 and 3.4 which in a more explicit and log linear or econometric form can be expressed as:

$$ROA_t = \beta_0 + \beta_1 LR_t + \beta_2 INT_t + \beta_3 INF_t + \beta_4 MDR_t + \beta_5 CRR_t + \beta_6 MPR_t + \beta_7 ROE_t + \varepsilon_t \quad (3.3)$$

$$ROE_t = \beta_0 + \beta_1 LR_t + \beta_2 INT_t + \beta_3 INF_t + \beta_4 MDR_t + \beta_5 CRR_t + \beta_6 MPR_t + \beta_7 ROA_t + \varepsilon_t \quad (3.4)$$

Where:

ε = Stochastic error term

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7 > 0$ = the apriori expectation is positive values

There are however some limitations due to the paucity of data from CBN, it became difficult and almost impossible to obtain data to cover the period under review as most of the data for some variables specified were virtually not available.

DATA PRESENTATION AND ANALYSIS RESULTS.

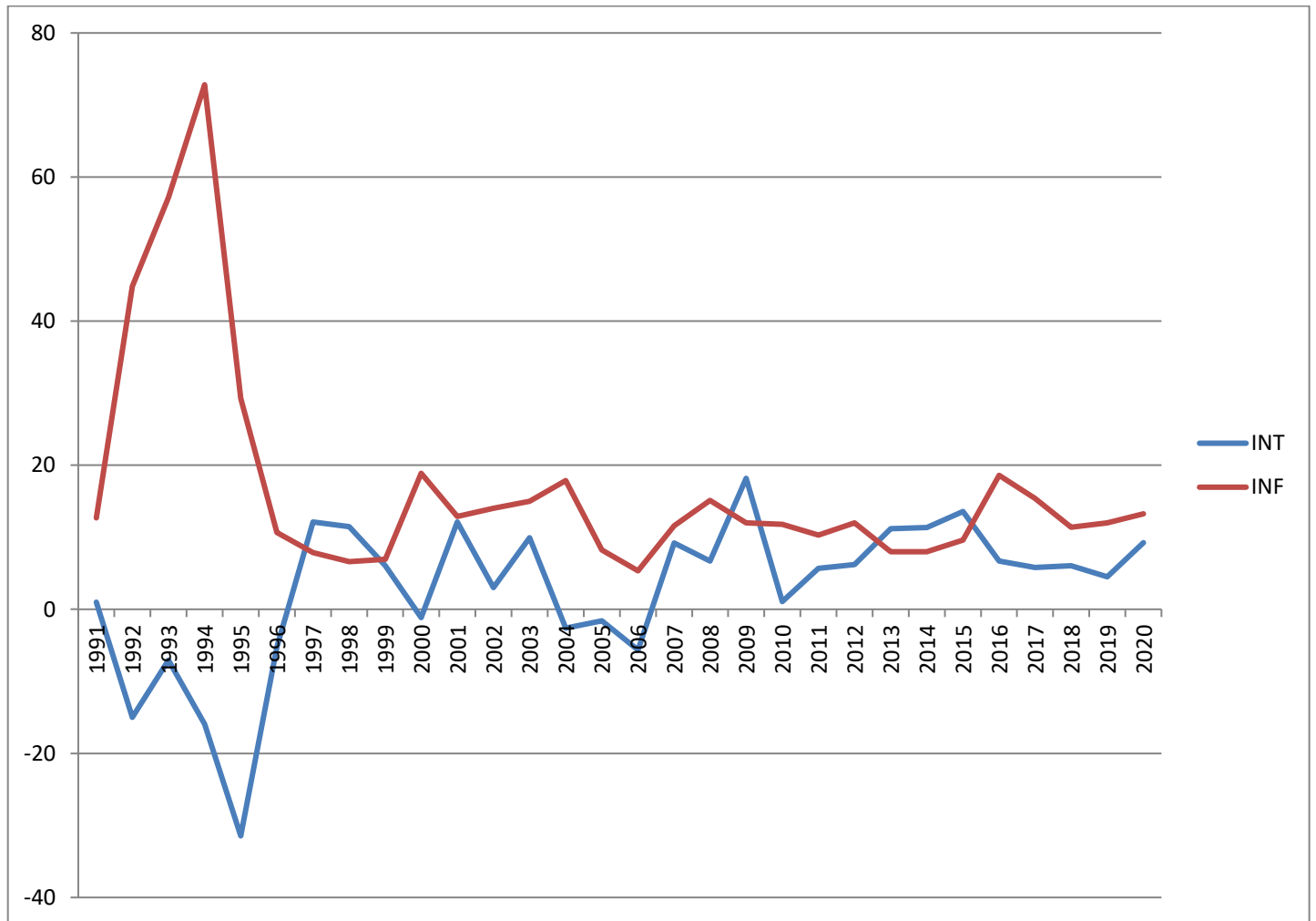
Data presentation

Trend analysis of inflation and interest rate in Nigeria has become a source of concern to both the Government and members of the public. It is therefore obvious to state that the tide of rising inflation trend can only be controlled if certain policies and actions by both government and public entity authorities are religiously executed (Philip, 1999). Okere and Sanni, (2005) said it has become one of the perennial problems that has plagued the nation especially in the late 80's and 90's. According to him, the trend shows four (4) major episodes of high inflation in excess of 30 percent characterized (especially during the SAP era) by wage increase which created a cost-push effect. Some of the factors often adduced for this inflation is the drought in the northern part of Nigeria which destroyed agricultural produces and pushed up the cost of agricultural food items, a significant proportion of the average consumers' budget; worsening terms of external trade among others. The experience indicates an excess monetization of oil exports revenue which might have given the inflation a monetary character reaching the peak at 40 percent in 1991. At that time, the government was under pressure to devalue her currency from debtor groups like the IMF. The expectation that devaluation was imminent fueled inflation as price adjusted to the parallel rate of exchange. Over the same period, excess money growth was about 43 percent and credit to government had increased by over 70 percent (Okere & Sanni, 2005), and (Ogunbiyi & Funsho, 2010 and Osunkwo, 2021). The third high inflation episode started in the last quarter of 1987 and accelerated through 1988 and 1989. This episode is related to the fiscal expansion that accompanied the 1988 budget. Though, initially, the expansion was financed by credit from the CBN, it was later sustained by increasing oil revenue that was not sterilized. In addition, with the debt conversion exercise, through which debt for equity swaps took place, external debt was repurchased with new local currency obligation.

The fourth inflationary episode occurred in 1983 and persisted through the end of 1997. Though inflation gathered momentum towards the tail end of 1993, it reached 80% by the end of 1997, the highest rate since the 1980s and by the end of 1997, it was above 70%. As with the third inflation period; it coincided with a period of expansionary fiscal deficit and money supply growth. The authorities found it too difficult to contain the growth of the private sector domestic credit and bank liquidity and by the end of 1992, money supply growth was 70%. The trend continues on a swinging note up to 1999 when Nigeria became a democratic nation and the rate currently stood at 13.25 percent in February 2020 (CBN, 2020).

The best course is a stable inflation rate, to avoid uncertainty and rash actions. The value for Real interest rate (%) in Nigeria was 6.05 as of 2018. As the graph below shows, over the past 48 years this indicator reached a maxim

Figure 1: Trend analysis of inflation and interest rate



Where **INF** = Inflation rate

INT = Interest rate

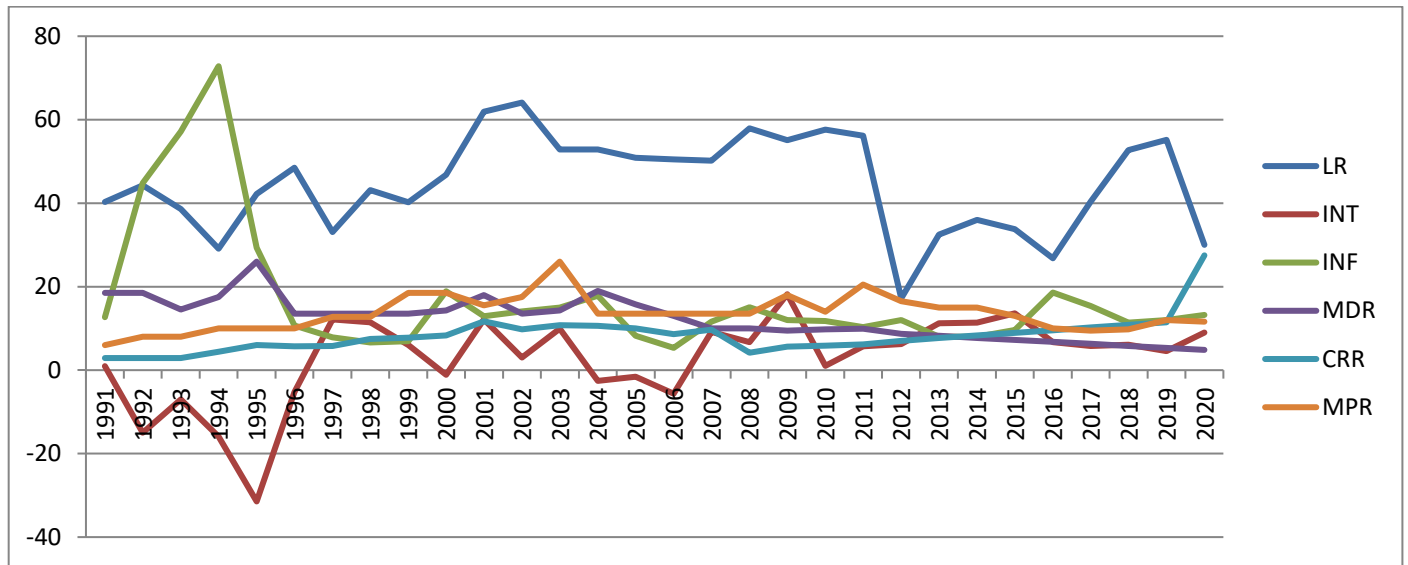
Source: Authors computation.

Trend analysis of exogenous variables used in this study

The graph below shows the trend in movement in inflationary rate, interest rate, liquidity ratio, the minimum rediscount rate, cash reserve ratio and monetary policy rate of the Central Bank of Nigeria. As evidenced from the literature, a cursory look at inflationary rates shows that it reached its peak of 72 percent in 1994 after the much visible fluctuations. The increasing trend continued up to 44.5 percent in 1994, 57.2 in 1995, 57.0 in 1996 and 72.8 in 1997 which could be tagged as the highest ever witnessed by the economy. The logical explanation is evidence in the literature. On the other hand, interest rate maintained a persistent but minor fluctuations increase until it reached its peak at 42 percent in 2010. This may not be unconnected from the recent global financial crises that found its way into the economy. As a matter of controlling money in circulation, the liquidity ratio seems not to have a definite movement pattern. This is evidenced from the fact that its usage is at the mercy

of situational circumstances. The cash reserve ratio and the minimum rediscount rate show onward similar movement with liquidity ratio.

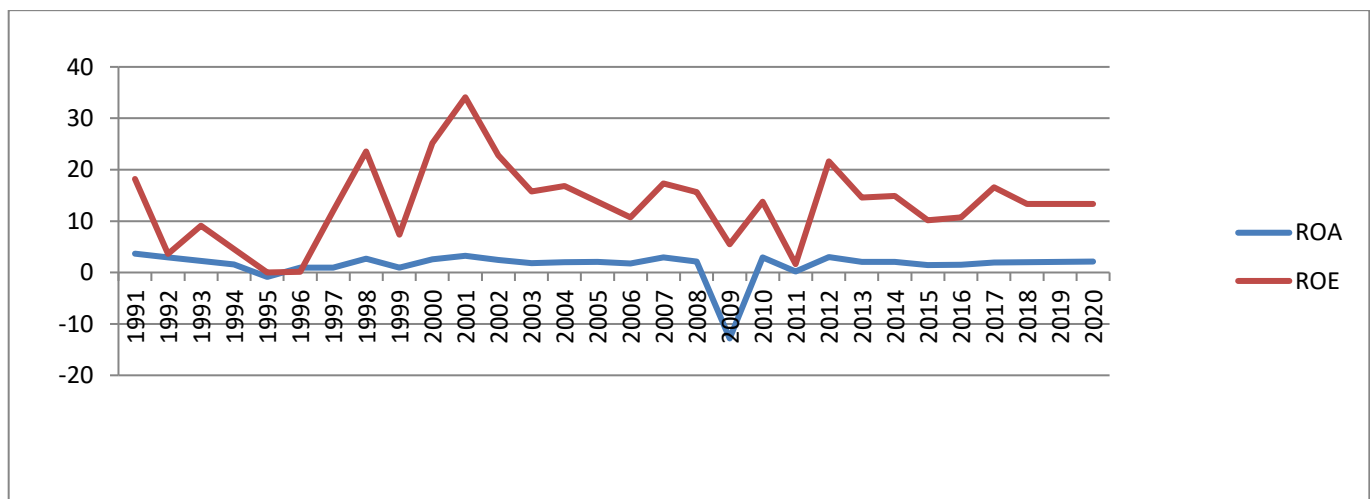
Figure 2: Trend of exogenous variables used in this study



Source: Authors computation

Trend analysis of Returns on assets and returns on equity in Nigeria

Figure 3: Returns on assets and returns on equity in Nigeria



Source: Authors computation.

Unit root test

The Augmented Dickey Fuller (ADF) and the Phillip-Peron (PP) test which is the unit root test was carried out on the variables.. The result as presented in table 4.2 shows that ROA, ROE, LR and MPR are stationary at level with values of -5.755355, -3.746712, -2.998654 and -3.052420 respectively. The other variables where stationary at first difference. This is so because their estimated values of INF, MDR and CRR of -5.734119, -3.895423, -2.775473 respectively were greater than the critical values at 1 percent, 5 percent and 10 percent as the case may be at 1st difference.

The result of Phillip-Peron (PP) test proves and confirmed the result produce by the ADF unit root test. The estimated values are greater than the critical values at 1 percent, 5 percent and at 10 percent levels as the case

may be. Since the variables are integrated of different orders, i.e I(0) and I(1), the study adopted the autoregressive distributed lag model (ARDL) in the analyses.

Table 4.2 Unit root test

Augmented Dickey Fuller (ADF) test				Phillips Perron (PP)		
Variables	Level	1 st Difference	Order of integration	Level	1 st Difference	Order of integration
ROA	-5.755355	-	I(0)		-	I(0)
ROE	-3.746712	-	I(1)			
LR	-2.998654	-	I(0)	-2.998654	-	I(0)
INT	-2.272436	-4.569045	I(1)	-2.849859	-	I(0)
INF	-2.234197	-5.734119	I(1)	-2.336252	-5.845132	I(1)
MDR	-1.868452	-3.895423	I(1)	-1.537286	-20.54893	I(1)
CRR	0.550177	-2.775473	I(1)	0.769793	-2.974723	I(1)
MPR	-3.052429	-	I(0)	-2.966235	-	I(0)

Critical Test Value

Level		1 st Difference	
1% level	-3.679322	1% level	-3.769597
5% level	-2.967767	5% level	-3.004861
10% level	-2.622989	10% level	-2.642242

Source: Authors computation using E-views 10.

ARDL Long Run Estimation of the Model

Equation 1 result

The result of table 4.5 shows that a one percent increase in Liquidity ratio (LR) leads to an increase in Returns on assets by 0.039889 percent. The result also shows that a one percent increase in inflation rate would lead to a 0.002472 percent decrease in Returns on assets. The result likewise shows that a one percent increase in interest rate leads to a 0.002321 percent increase in Returns on assets Similarly, a one percent increase in Minimum discount rate would lead to a 0.001572 percent increase in Returns on assets. Also, a one percent increase in Cash reserve ratio (CRR) leads to a 0.000299 percent increase in Returns on assets. But a one percent increase in Monetary policy rate (MPR) leads to a decrease of Returns on assets by 0.005872 percent. From the result, it shows that they follow theoretical expectations. The R-squared value of 0.853535 shows that the model has a good fit of about 85.35 percent of the total variations in the dependent variable, the Durbin-Watson statistics value of 1.986661 shows that there is no issue of autocorrelation in the variables.

The result shows that the variables are not statistically significant but have a positive long run relationship except that of Liquidity ratio (LR) which is positive and also statistically significant.

Table 4.5 ARDL long run estimate of Returns on assets

Dependent Variable: ROA				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LR	0.039889	0.011863	3.362563	0.0028
MDR	0.001572	0.001586	0.991123	0.3324

MPR	-0.005872	0.010600	-0.553976	0.5852
CRR	0.000299	0.000977	0.305633	0.7628
ROE	0.002123	0.006231	2.33240	0.3260
C	15.46816	0.253332	61.05893	0.0000
R-squared	0.853535	Mean dependent var		17.57506
Adjusted R-squared	0.831836	S.D. dependent var		0.265821
S.E. of regression	0.109007	Akaike info criterion		-3.452202
Sum squared resid	0.320830	Schwarz criterion		-3.223181
Log likelihood	28.23524	Hannan-Quinn criter.		-3.376288
F-statistic	39.33601	Durbin-Watson stat		1.986661
Prob(F-statistic)	0.000000			

Source: Authors computation using Eviews 10.

Equation 2 result

Table 4.6 shows that all the variables except Cash reserve ratio (CRR) and Interest rate (INT) are not statistically significant but have a long run positive relationship with Returns on equity. Minimum discount rate (MDR) and Inflation (INF) are negative but significant. This however satisfies and is line with *a priori* theoretical expectations.

Therefore, the result as shown in table 4.10 shows that a one percent increase in Liquidity ratio (LR) would lead to a 0.81987 percent increase in Returns on equity. Also, an increase in Cash reserve ratio (CRR) by one percent would bring about a 0.001838 percent increase in returns on assets. In the same way, a one percent increase in Monetary policy rate (MPR) would lead to a 0.0555 percent increase in returns on equity. Similarly, a one percent increase in interest rate would cause returns on equity to increase by 0.044790 percent. A one percent increase in minimum discount rate (MDR) and Cash reserve ratio (CRR) would cause Returns on equity to increase by 0.157884 and 0.79616 percent increase respectively. But a one percent increase in returns on assets rate will lead to a 0.006670 percent decrease in Returns on equity. In the same vein, a one percent increase in Inflation (INF) would cause Returns on equity to decrease by 0.071677 percent. This result conforms to the theoretical expectations. The result also shows that the R-squared value 0.966201 shows that the model explained 96.6 percent of the total variations in the dependent variable, leaving about 3.4 percent of the unexplained variable. This means that the model has a good fit. The Durbin-Watson statistics of 1.33 falls on the no auto-correlation region. The above thus shows that the percentage increase of payment channels has more effect and impact on Returns on assets than all the other variables.

Finally, comparatively, the result proves and shows that both returns on assets and returns on equity has impact and it is relevant in productivity and the stability of deposit money banks in Nigeria. This is seen in the value of LR, MDR, MPR, and CRR when Similarly, the Returns on assets relation is highly predictable in a statistical sense as can be seen by the goodness-of-fit statistics (R-squared and adjusted R-squared).

Table 4.6 ARDL long run estimate of Returns on equity

Dependent Variable: ROE				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LR	0.081587	0.015446	5.282090	0.0000
ROA	-0.006670	0.002151	-3.100990	0.0045
MPR	0.055529	0.008174	6.793547	0.0000
CRR	-0.001838	0.001592	-1.154885	0.2583
INT	0.044790	0.034411	1.301609	0.2065
MDR	0.157884	0.039796	3.967336	0.0007
INF	-0.071677	0.028918	-2.478672	0.0213

LOG(MPR)	0.079616	0.035143	2.265477	0.0337
C	13.81172	0.426367	32.39400	0.0000
R-squared	0.966201	Mean dependent var		17.58957
Adjusted R-squared	0.953910	S.D. dependent var		0.257015
S.E. of regression	0.055177	Akaike info criterion		-2.718832
Sum squared resid	0.066980	Schwarz criterion		-2.302513
Log likelihood	51.14189	Hannan-Quinn criter.		-2.583122
F-statistic	78.61293	Durbin-Watson stat		1.339262
Prob(F-statistic)	0.000000			

Source: Authors computation using Eviews 10.

Parsimonious Error Correction Model Results

The parsimonious result was arrived at by selecting the statistically significant variables and other concerned variables of the study and used in estimating the parsimonious error correction model. The results of the parsimonious error correction model for short run dynamics result is as presented in table 4.7 above shows that the Error Correcting term (ECM), in the model shows the speed of adjustment from short run equilibrium to the long run equilibrium. However, it should be noted that the greater the coefficient of the parameter, the higher the speed of adjustment of the model from the short run to the long run. The error correction model (ECM) is negatively signed and is statistically significant as expected by theoretical expectation. This shows that there is a dynamic adjustment from short run to long run. The coefficient of the ECM of 0.850488 shows that about 85 percent of the deviation from equilibrium was corrected each year. This thus shows that there is a fast speed of adjustment from the short run to the long run equilibrium.

The R-squared and adjusted R-squared of 0.995991 and 0.994596 respectively shows that the variables in the model explained about 99 percent of the total variations in the dependent variable. This can be explained by the changes in the independent variable and also leaving one percent for factors which were not captured in the model. This means that the model has a good fit. The Durbin Watson statistics value of 1.646475 falls within the critical region of no auto-correlation. Meaning that there is no issue of serial correlation among the residual in the model. It is also noted that the Durbin-Watson statistics value is greater than the R squared. Indicating that the result is not spurious, it is well behaved and can be used for policy decision in Nigeria.

The F-statistic value of 714.2468 is statistically significant. This indicates that all the independent variables in the model have a combined impact on the dependent variable. Thus, a high degree of linear association exists between the dependent and the independent variables.

The result indicates that the coefficient of the intercept is positive and statistically significant with a value of 14.01273. This means that in the absence of all the independent variables in the model, returns on assets will still increase by 14.01 percent. The result shows a positive relationship between Liquidity ratio (LR) and returns on assets. Thus, implying that a one percent increase in LR will cause an increase in Returns on assets by 0.047277. The variable is however significant in causing Returns on assets to increase.

The coefficient of Minimum discount rate (MDR) is negative and significant as posited by theoretical expectation. From the result gotten, it shows that a one percent increase in Minimum discount rate will cause a decrease in Returns on assets by 0.001164 percent. The reason behind this is that Minimum discount rate is not fixed but it fluctuates based on demand and the amount been offered by the Central Bank of Nigeria (CBN). Since Minimum discount rate is government controlled. Thus, Minimum discount rate has an inverse relationship with Returns on assets.

The coefficient of Cash reserve ratio (CRR) is positive and significant. Although the *a priori* theoretical expectation proposed a positive result. The result shows that a one percent increase will cause a 0.001502

percentage increase in Returns on assets. This means that Cash reserve ratio affects Returns on assets and causes it to be either stable or unstable.

The coefficient of Monetary policy rate (MPR) is also positive and significant. This is in line with a priori expectation as predicted theory. The result shows that a one percent increase will cause a 0.010020 percentage increase in Returns on assets. The positive estimate means that when there is an increase in Monetary policy rate, banks will rather have very few monies in their vault thus little money to give out as loans to investors and the public. However, the level of money that will be in circulation is dependent on how large the rate is.

The coefficient of interest rate (INT), liquidity ratio (LR), and cash reserve ratio (CRR) is positive and significant. Thus, a one percent increase in INT, CRR, LR will cause Returns on assets to increase by 0.066501, 0.111215, and 0.031850 percent respectively. The coefficient of Inflation (INF) is significant but negative. Implying that a one percent increase in INF will cause Returns on assets to decrease by 0.036183 percent.

Table 4.7 Parsimonious Short Run Result

Dependent Variable: LOG(M)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(LR)	0.247277	0.003742	12.63464	0.0000
DMDR	-0.001164	0.000548	-2.124205	0.0446
DMPR	0.010020	0.003344	2.296111	0.0064
DCRR	-0.001502	0.001016	-3.479237	0.1526
LOG(INT(-1))	0.111215	0.015210	7.312062	0.0000
LOG(INF(-1))	-0.036183	0.010884	-3.324362	0.0030
LOG(ROE(-1))	0.031850	0.014471	2.900942	0.0380
ECM(-1)	-0.850488	0.064315	-15.54856	0.0000
C	14.01273	0.156117	89.75818	0.0000
R-squared	0.995991	Mean dependent var		17.57506
Adjusted R-squared	0.994596	S.D. dependent var		0.265821
S.E. of regression	0.019540	Akaike info criterion		-4.800429
Sum squared resid	0.008782	Schwarz criterion		-4.388190
Log likelihood	85.80686	Hannan-Quinn criter.		-4.663783
F-statistic	714.2468	Durbin-Watson stat		1.646475
Prob(F-statistic)	0.000000			

Source: Author's computation using Eviews 10.

Stability Test

The Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMSQ) tests were applied so as to examine the stability of the parameter after the ECM models were estimated. Figure 4a and 4b shows that both the CUSUM and CUSUMSQ statistics falls within the critical bound of \pm five percent level of significance. This plot indicates that the coefficients of the results been estimated are stable in the long run during the period 1991 to 2020 and that there exists a long run relationship between profitability and liquidity management in Nigeria. This thus implies that the coefficients are changing gradually.

Figure 4: CUSUM for bank profitability

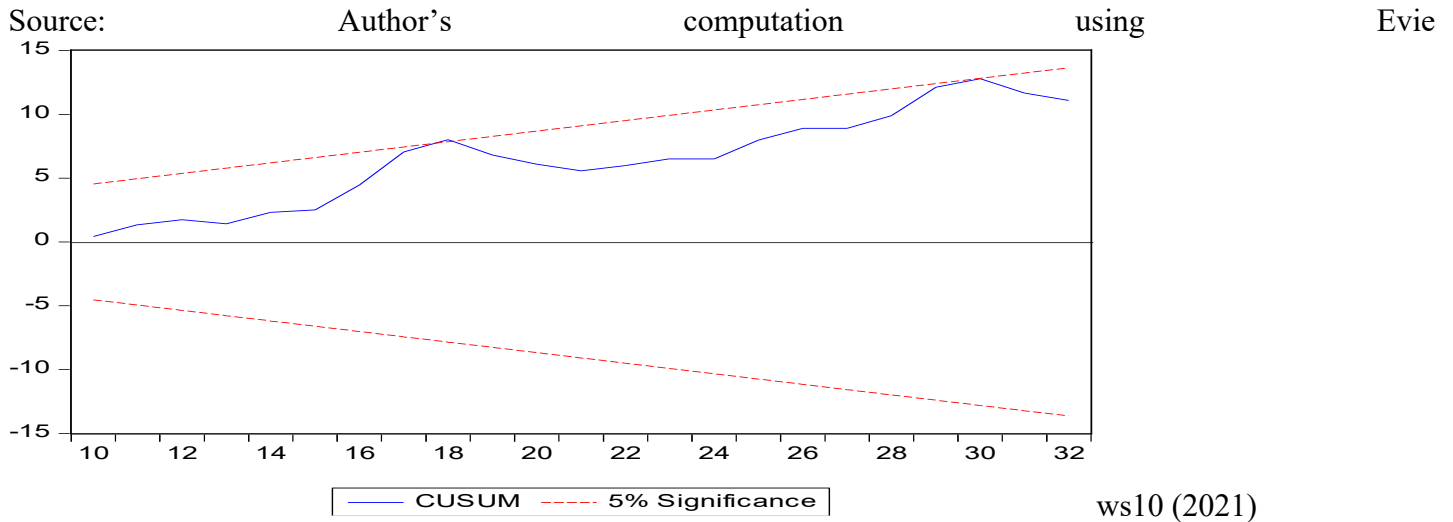
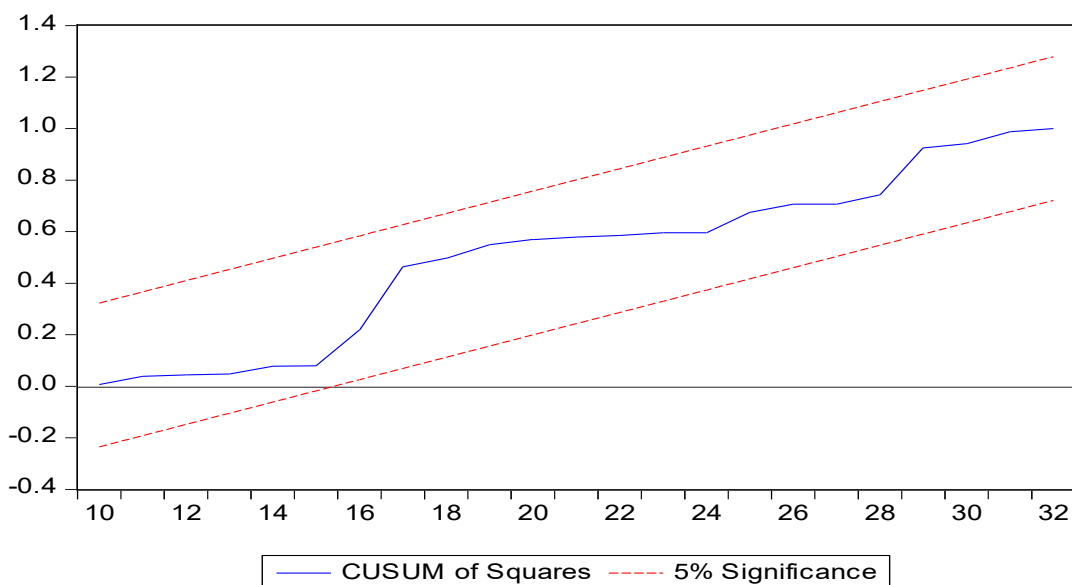


Figure 5: CUSUMSQ for bank profitability



Source: Authors computation using Eviews 10.

DISCUSSION OF FINDINGS

The study revealed that interest rate, cash reserve ratio (CRR), minimum rediscount rate (MRR), liquidity ratio (LR), and monetary policy rate (MPR) exert a positive and significant impact on banks' profitability, measured by return on assets (ROA) and return on equity (ROE) in Nigeria, while inflation rate has a negative effect on both profitability indicators.

The positive and significant impact of interest rate and MPR suggests that adjustments in monetary policy instruments directly influence banks' income through the interest rate channel. Higher policy and lending rates enhance banks' interest margins, leading to increased profitability (Ogunleye, 2020). Similarly, the CRR and MRR having positive effects indicate that monetary tightening encourages more efficient liquidity management and prudent asset allocation, which strengthen profitability in the long run (Adeleke & Yusuf, 2022).

The significant influence of the liquidity ratio implies that maintaining adequate liquidity enables banks to meet short-term obligations and support stable earnings, aligning with the liquidity–profitability trade-off theory. This demonstrates that Nigerian banks can simultaneously maintain liquidity and profitability when monetary policies are properly aligned.

Conversely, the negative impact of inflation rate on ROA and ROE indicates that rising inflation erodes the real value of financial assets, increases operational costs, and weakens the purchasing power of borrowers, thereby reducing loan quality and profitability (Samuel & Ijeoma, 2021). This finding is consistent with Mishkin (2016), who noted that high inflation distorts financial intermediation and impairs the real returns of banks.

Overall, the findings highlight that while tight monetary policies enhance bank profitability through improved interest margins and liquidity control, persistent inflation undermines these gains. Policymakers must therefore maintain a balance between price stability and profitability objectives to ensure a sound and resilient banking system.

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

Summary of findings

This study was to examine the impact of returns on assets and equity on profitability of deposit money banks in Nigeria. The study used annual data that spanned from 1991 to 2020 and adopted the ARDL bounds testing approach and several estimation tests. Some of the test that was used includes the unit root test, cointegration test, Granger causality test, the ECM, CUSUM and the CUSUMSQ.

Previous literatures were reviewed in chapter two of the study and the result and conclusion of the study reviewed has a mixed result. Some studies stated that returns on assets and equity actually impact profitability in deposits money bank in Nigeria, while other studies however are of the opinion that returns on assets and equity has no impact on profitability in deposit money banks in Nigeria. This study was able to fill the research gap by examining at the same time the various components of returns on assets and equity and their impact on profitability and also using real data instead of proxies has been used by other studies.

Several findings were made in the conduct of this study. A summary of the findings is as stated. From the result of the analysis carried out, it shows:

Liquidity ratio, cash reserve ratio, monetary policy rate, and interest rate all have a significant and positive effect and are correctly signed. Minimum discount rate and inflation were negatively signed but statistically significant. This thus supports theoretical expectation. Though some studies exert that returns on assets and equity has a negative relationship with profitability but the result in this study proves otherwise. In comparing all the variables, it was discovered that the coefficient and statistical test of liquidity ratio (LR) have the greatest impact on profitability than the other variables included in the equation.

Profitability is stable given the high value of the fitness of the model as shown in the CUSUM and CUSUMSQ test. This is as a result of the modification in the returns on assets and equity due to interest rates and monetary policy, and the unpredictability of inflation.

Conclusion

This research study was carried out to examine the impact of returns on assets and equity on profitability of deposit money banks in Nigeria. The extant literature shows that returns on assets and equity has the influence of impacting profitability in deposits money bank in Nigeria. Liquidity ratio, minimum discount rate, cash reserve ratio, monetary policy, interest rate and inflation were used as variables in the research study. The study applied the Augmented Dickey Fuller (ADF) Test, the Phillip-Peron test, Auto-regressive Distributed Lag Bounds approach, Granger causality test and the Error Correction Model (ECM) regression analysis technique. An annual data that spanned through a period of thirty years from 1991-2020 was utilized. The Error Correction

Model (ECM) is correctly signed and statistically significant. The result from the parsimonious estimation shows that all the variables are statistically significant and positive while minimum discount rate and inflation are statistically significant but negative which satisfies the theoretical expectation. The result of the analysis keen on the relationship between returns on assets and equity on profitability implies that returns on assets and equity have a positive effect on profitability.

Policy recommendation

The following policy recommendations are made and are considered necessary based on the results of the findings of the study carried out:

1. The study recommends that more areas of reforms that will help qualify more Nigerian banks for profitability should be given adequate attention. The reforms can be; (1) increased capitalization, (2) further reduction in the banks' exposure to credit risk, (3) reforms on monetary policy innovation as well as the positive impact of operating a rate of exchange regime that is managed.
2. The CBN should consider increasing the minimum capitalization of banks in line with perceived Naira depreciation or an inflation rate spike. Where there is an adequate regulatory effort by the CBN, banks will become more efficient and that efficiency of their stock's performance will reduce volatility, which will boost investors' trust and participation in the bank equity and assets holding. But the decision by the CBN to increase the loan to deposits ratio to 60 percent in order for banks to lend to the real sector in 2019, might increase the credit risk exposure of deposit money banks; as this directive came with the penalty of a fine. Banks seem to have been investing their depositors' cash on less risky assets such as government securities.

REFERENCES

1. Aburime, T. U. (2008). Determinants of Bank Profitability: Macroeconomic Evidence from Nigeria.
2. Adebayo, O. A., Adeyanju, O. D., and O. S. Olabode (2011). "Liquidity management and Commercial Banks Profitability in Nigeria" *Research Journal of Finance and Accounting* Vol 2, No 7/8, 2011.
3. Adeleke, T., & Yusuf, K. (2022). Monetary policy and bank performance in Nigeria: An empirical analysis. *Journal of Banking and Finance*, 18(2), 55–68.
4. Alhassan, A.L. (2015). Income diversification and bank efficiency in an emerging market. *Journal of Managerial Finance*, (41), 1318 – 1335. doi: 10.1108/MF-12-2014-0304.
5. Almaqtari, F.A., Al-Homaidi, E.A., Tabash, M.I., & Farhan, N.F. (2018). The determinants of profitability of Indian commercial banks: A panel data approach.
6. Asif, H. S. and Hadeeqa, M. (2019). Impact of liquidity and financial leverage on firm's profitability – an empirical analysis of the textile industry of Pakistan: *Research Journal of Textile and Apparel* 23(4).
7. Batten, J., & Vo, X.V. (2019). Determinants of bank profitability: Evidence from Vietnam. *Emerging Markets Finance and Trade*, Taylor & Francis Journals, 55(60), 1417-1428.
8. Bhattacharyya, I., & Sahoo, S. (2011). Comparative Statistics of Central Bank Liquidity management, some insights. *Economic Research International*, 7(3), 75-89.
9. Botlhale, M. & Paul-Francois, M. (2016). Effect of Capital and Liquidity Management on Profitability of Major South African Banks.
10. Cowry Research Desk (2009). Nigerian banking report: Research Desk of Cowry Asset Management Limited (CAML) [Internet]. Retrieved from: www.cowryasset.com
11. Darush, Y. & Peter, O. (2016). The impact of trade credit use on firm profitability: empirical evidence from Sweden *Journal of Advances in Management Research* 13(2).
12. Djalilov, K., & Piesse, J. (2019). Bank regulation and efficiency: Evidence from transition countries. *International Review of Economics and Finance*, 64, 308-322.
13. Isomocos, O. F. (2003). Performance and the Profitability of a Firm
14. Mishkin, F. S. (2016). *The economics of money, banking, and financial markets* (11th ed.). Pearson.
15. Muraina, S.A. (2018). Determinants of listed deposit money banks' profitability in Nigeria. *International Journal of Finance and Banking Research*, 4(3), 40-56.

16. Ogunleye, T. O. (2020). Interest rate policy and financial sector profitability in developing economies. *African Economic Review*, 32(1), 77–92.
17. Osunkwo, E.C and Edame, G.E. (2021) Profitability and Liquidity Management of Deposit Money Banks in Nigeria. Calabar: University of Calabar, Department of Economics. Unpublished B.Sc (Economics) Research Project.
18. Samuel, U., & Ijeoma, N. (2021). Interest rate spread and bank profitability in Nigeria. *International Journal of Finance and Banking Studies*, 10(3), 112–128.
19. Yao. H., Haris, M., & Tariq, G.(2018). Profitability determinants of financial institutions: Evidence from banks in Pakistan. *Int. J. Financial Stud.*, 6(2), 53; Retrieved from <https://doi.org/10.3390/ijfs6020053>
20. Zelalem, B. B. (2020). Determinants of Bank Liquidity and Its Impact on Bank Profitability in Ethio