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the two countries' stock indices and gold spot. Outcome of the study confirmed the Existence of volatility hedge potential for the two countries stock indices from gold Spot. The outcome provided a wider implication for the Nigerian banking stock index especially given its remarkable appreciation in recent time.

Determinants of Bank Failure in Nigeria: An empirical Investigation By Prof. Haruna Mohammed Aliero and Paul Ache

This study investigates the determinants of bank failure in Nigeria from 1970-2013. It uses Autoregressive Distributed Lag (ARDL) approach in the analysis and further examines the extent to which these determinants lead to bank failure in Nigeria. The study found that there is significant long run relationship between bank failures and exchange rate, interest rate, capital adequacy ratio, and non-performing loans and liquidity ratio, but an insignificant relationship with inflation in Nigeria.

REVIEW OF DEVELOPMENTS IN THE FINANCIAL SECTOR IN THE FIRST AND SECOND QUARTERS OF 2017

1.0   INTRODUCTION

The financial sector recorded remarkable developments in the first half of 2017. Most of these were partly due to policies made by the Monetary Policy Committee (MPC) of the Central Bank of Nigeria (CBN) and broad-based initiatives of Federal Government to engender real sector growth. This chapter presents these developments and how they affect the economy, especially the financial sector. After the introduction in section one, Section 2 presents international economic developments. Section 3 discusses domestic macroeconomic and financial developments while Section 4 reviews developments in the capital market and Section 5 presents exchange rate dynamics. Movement in foreign exchange reserves is discussed in Section 6 while Section 7 reviews CBN circulars pertaining to deposit taking financial institutions and mobile payment operators.

2.0   INTERNATIONAL ECONOMIC DEVELOPMENTS

Growth outcomes in the first half of 2017 was generally stronger than expected, due to firmer domestic demand growth in advanced economies and China as well as improved performance in other large emerging market economies. The global economy grew by 2.8% and 3.2% in the Q1 and Q2 of 2017, respectively, compared to 2.6% growth recorded in Q4, 2016.

Oil price and other commodities prices declined in the first half of 2017, as against the earlier increase in Q4, 2016. Core inflation in most advanced countries and emerging markets, however, remained stable. Long term bond yields in advanced economies rebounded in Q2 from earlier contraction in Q1. Equity prices also remained strong as markets continued to be more optimistic about corporate earnings.

Exchange rate and capital flows in Q4, 2016 reversed in the first half of 2017. The U.S. dollars appreciated by over 6% in the last half of 2016, but depreciated by around 3.5% in real effective terms since Q1 2017. In contrast, the Euro appreciated by around the same percentage in this period while it weakened in the last two quarters of 2016. Also capital flows into emerging markets have increased in the first half of 2017 as against notable decline recorded in late 2016.

Generally, global growth momentum is weighed down by medium-term downside risks. However, some upside risks, such as the cyclical rebound of economic activities in Europe where the political risk has diminished and depreciation-induced export-led growth in US-trading partners, boosted global growth. Many downside risks are hinged on monetary policy normalization in some advanced economies, policy uncertainties in US over regulatory and fiscal issues, and Euro-zone post-Brexit arrangement; inward-looking policies and trade protectionism; as well as rising geopolitical tensions and other shocks emanating from weak governance and corruption.

3.0   DOMESTIC ECONOMY AND FINANCIAL DEVELOPMENTS

The Nigerian economy, like any other economy in the world, is not immune to the effects of global economic developments due to trade, financial and other linkages. As a result, there were several changes in many sectors of the economy, especially the financial sector. Some of these developments were direct effects of external sector events while others were due to policy responses by relevant government authorities. This section presents the developments with emphasis on the financial sector.

3.1   CBN Monetary Policy Committee Meetings

The MPC met in January, March and May, 2017 in the period under review. The Committee maintained contractionary monetary policy stance with Monetary Policy Rate

(MPR) kept at 14% and Cash Reserve Ratio (CRR) at 22.5% as some of the steps taken to improve price and foreign exchange-rate stability.

3.2 Gross Domestic Product (GDP)

GDP recorded a growth rate of 0.55% in Q2 of 2017, in contrast to negative growth in the previous five quarters. Figure 1 presents year-on-year GDP growth rates and shows that the economy emerged from recession in Q2, 2017. The emergence from recession was partly driven by improved price of crude oil from $46.39 per barrel in February to $52.94 per barrel in April, and improved productivity in the nonoil sector which grew by 0.7% and 0.41% in Q1 and Q2, 2017, respectively. Also, indicators of domestic economic activities such as Purchasing Manager Index (PMI) and Composite Economic Index of Economic Activities (CIEA) showed that economic activities were on significant increase in Q1 2017 and heralded positive GDP growth in Q2 2017.

Figure 1: GDP growth (Q1 2016 - Q2 2017)
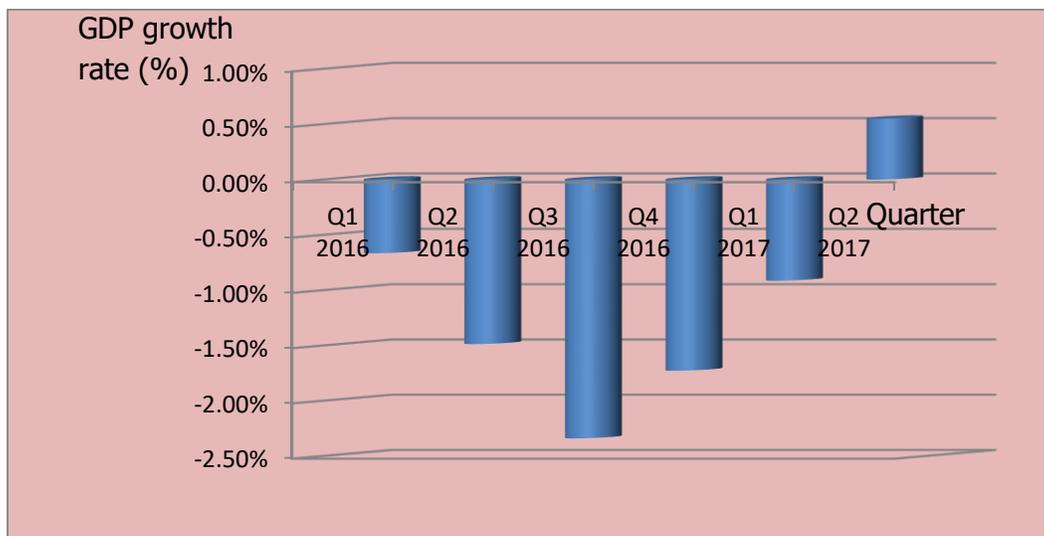
Source: National Bureau of Statistics

The Fairly stable and higher levels of oil production also contributed to the promising economic performance in Q2 2017. Oil production was estimated to have averaged 1.84 billion barrels per day (bbpd) in Q2 2017 as against 1.69 bbpd in Q1 2017. That, combined

with improving oil price, led to 1.64% year-on-year and 7.52% quarter-on-quarter growths. Nonoil sector growth of 0.72% and 0.45% in Q1 and Q2, 2017 respectively, also contributed to overall economic growth in Q2 2017.

It is expected that current growth momentum will be sustained. There are expectations that, implementation of the 2017 Economic Recovery Growth Plan (ERGP) will further strengthen growth and generate employment in the future.

3.3   Inflation

Headline inflation declined, as shown in figure 2, from 18.55% in Q4 2016 to 17.24% and 16.10% in Q1 and Q2, 2017, respectively. Core inflation moderated to 14.75% and 12.46% in Q1 and Q2, 2017, respectively, from 18.05% in Q4 2016. The MPC attributed the moderation to partly relative stability of exchange rate. The moderation could also be attributed to increasing economic activities and the engendered increase in supply of goods and services in the domestic markets.

Figure 2: Inflation rates (Q2 2016 – Q2 2017)
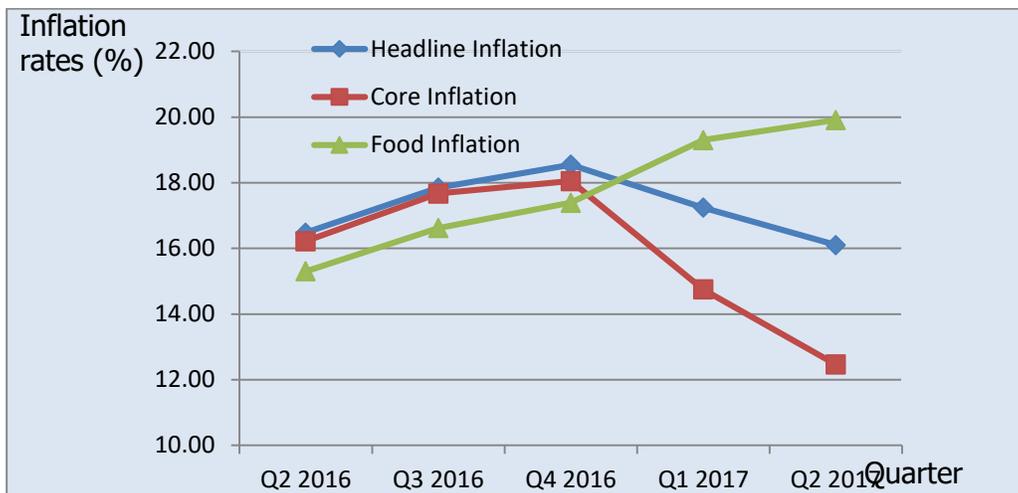
Source: Nigeria Bureau of Statistics

Food inflation however rose from 17.39% in Q4 2016 to 19.30% and 19.91% in Q1 and Q2, 2017, respectively. That was largely attributed to insecurity in the North East and other seasonal farming effects.

3.4   Money Supply and Rates

Broad money supply (M2) declined by 5.83% and 1.59% in Q1 and Q2, 2017, respectively from ₦23.34 trillion in Q4 2016. Narrow Money supply (M1) shared a similar growth trajectory. It declined by 10.06% and 0.71% in Q1 and Q2, 2017, respectively, against expansion by 12.60% in Q4 2016. Contraction in money supply stocks in the first half of 2017 was connected with the contractionary monetary policy stance of the CBN.

Net Domestic Credit (NDC) grew by 1.08% and 0.26% in Q1 and Q2, 2017, respectively, compared to 2.58% in Q4 2016. The marginal growth in net credit derived mainly from net credit to government which grew by 26.31% and 2.80% in Q1 and Q2, 2017, respectively. Credit to private sector shrank by 3.26% and 0.31% in the same period. The figures suggest that credit to private sector was crowded out by credit to government over the periods.

During the period under review, money market interest rates fluctuated with the level of liquidity in the banking system. Figure 3 shows that average Inter-Bank Call Rate and Open-Buy-Back (OBB) Rate closed at 13.46 % and 29.57% respectively at the end Q2 2017, as against 10.39% and 7.35% in Q4 2016. Maximum lending rate also rose from 28.55% in Q4 2016 to 30.94% in Q2 2017. Increase in the rate reflected the contractionary monetary policy effects.

Figure 3: Money Market Rates (Q2 2016 - Q2 2017)
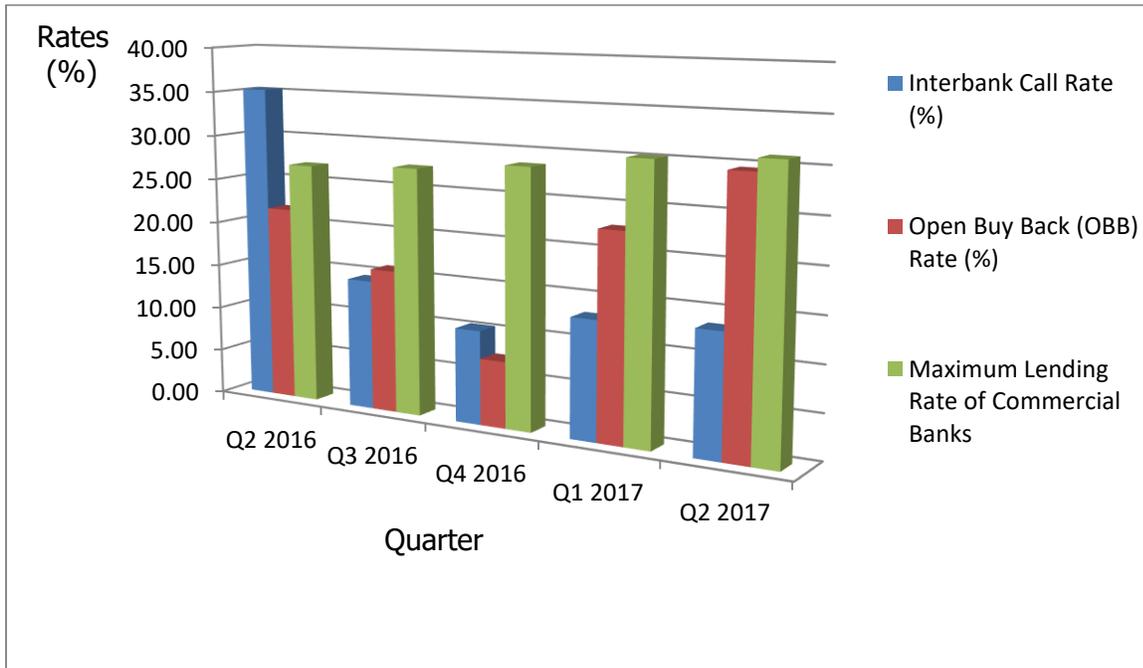
Source: CBN

4.0   CAPITAL MARKET

The Nigerian Stock Exchange All Share Index (ASI) rose by 29.79% from 25,516.34 in Q1 2017 to 33, 117.48 in Q2 2017. That contrasted with a negative growth of 5.2% in Q4 2016. Similarly, the equities market capitalization rose by 29.71% from ₦8.83 trillion in Q1 to ₦11.45 trillion in Q2 2017; against the 5.0% negative growth in Q4 2016. The performances signal economic recovery as the indicators were on the decline in Q4 2016.

5.0   EXCHANGE RATE

During the quarters under review, the average Naira exchange rate remained relatively stable at the inter-bank segment of the foreign exchange market. The rate at the parallel market declined. Figure 4 shows that exchange rate at the interbank market was ₦305.22/US$ in Q4 2016, and closed at ₦306.40/US$ and ₦305.72/US$ in Q1 and Q2 2017, respectively. Exchange rate at the parallel market continually fell from ₦455.26/US$ in Q4 2016 to ₦366.25/US$ in Q2 2017, showing some form of convergence to the interbank rate.

Figure 4: Exchange Rates of Naira (Q2 2016- Q2 2017)
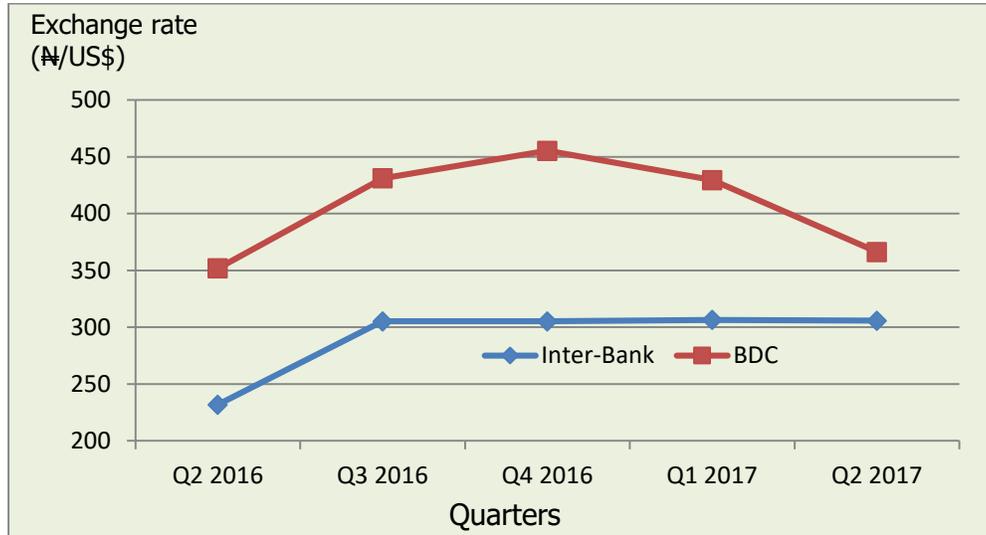
Source: CBN

6.0   FOREIGN RESERVE MANAGEMENT

Gross official reserves consistently improved in the first half of 2017, rising by 11.1% and 1.14% in Q1 and Q2, 2017, respectively. Figure 5 shows that the improvement in the Reserves position in 2017 started from growth of 13.37% in Q4 2016, marking departure from decline in previous quarters. The movement in Reserves appeared to be driven by oil price changes, as Reserves started to grow positively when the oil price rose above $50 per barrel in Q4 2016. However, the growth slowed down over the last three quarters as oil price closed at $47.42 at end of Q2 2017.

Figure 5: Foreign Exchange Reserves (Q2 2016- Q2 2017)
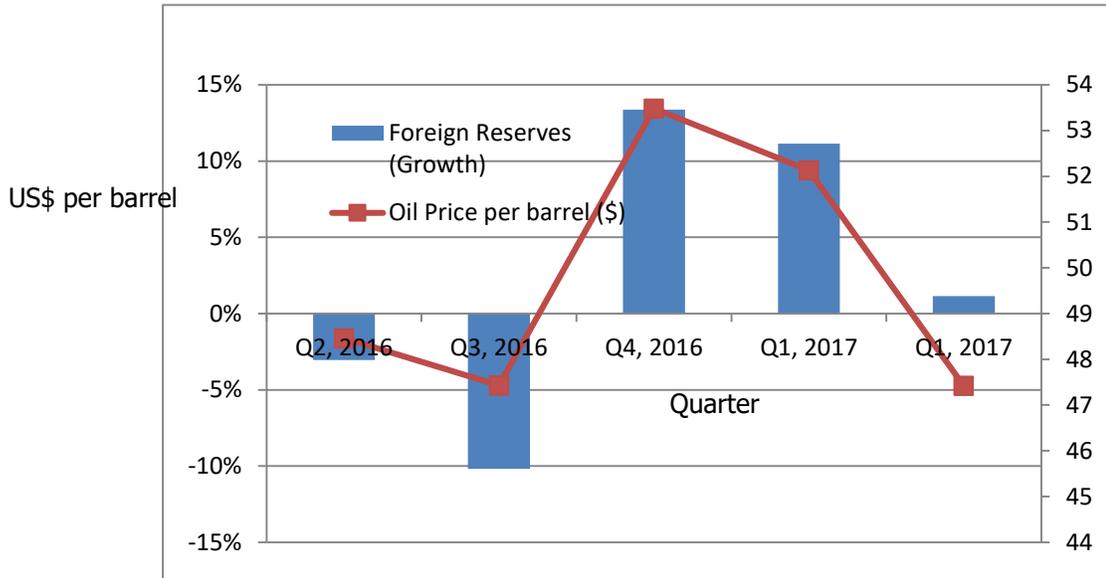
Source: CBN

7 CBN CIRCULARS

The CBN issued many Circulars and Guidelines in the period under review.

7.1 Circular to Banks and Other Financial Institutions on Virtual Currency (VC) Operations in Nigeria

The CBN, in the circular referenced **FPR/DIR/GEN/CIR/06/010** and dated 12th January, 2017, alerted the banks and other financial institutions on the risks inherent in Virtual Currency transactions and directed them to desist from engaging in VC, put in place effective AML/CFT controls and report suspicious transactions by customers who are VC exchangers to the Nigerian Financial Intelligence Unit (NFIU). The circular posits that VCs are not legal tenders in Nigeria and institutions transacting in them do so at their own risk.

7.2 Payment Of Annual License Renewal Fee Through Electronic Channels

In the circular **FPR/LAD/CON/BDC/01/006** dated January 16, 2017, the CBN informed all Bureau De Change and Finance Companies to timely comply with annual licensing renewals policy and pay the fees into designated accounts with the CBN through Real-Time Gross Settlement (RTGS).

7.3 Exposure Draft On "The Guidelines For Direct Debit Scheme And Bill Payments In Nigeria"

The CBN in the circular **BPS/PSV/GEN/CIR/01/001** dated January 30, 2017 informed banks, other financial institutions, service providers and the general public of the release of the exposure drafts of the "The Guidelines for Direct Debit Scheme" and "Bill Payments in Nigeria" for comments.

The Guideline supersede the previous Guidelines for Direct Debits issued by the CBN. The Draft, amongst others, recognizes the existing and emerging multi-channel options (Online platforms, Instant Payments etc.) applied for Direct Debit instructions in Nigeria.

7.4 Exposure Draft On "The Guidelines On Instant (Inter-Bank) Electronic Funds Transfer Services In Nigeria"

The CBN in the circular **BPS/PSV/GEN/CIR/01/003** dated February 3, 2017 released an exposure draft on "the guidelines on instant (inter-bank) electronic funds transfer (EFT) services in Nigeria" for comments in furtherance of its mandate of development of the electronic payments system in Nigeria.

The Guideline prescribed standards to guide the provision and implementation of instant EFT services in Nigeria and stipulated procedures geared towards the enhancement of the soundness of instant EFT services, while adequately protecting the interests of instant EFT customers and operators. The Guideline also provided minimum operational

standards and streamlined the operations of the various Instant EFT platforms operating in Nigeria.

7.5   **Circular On Nationwide Implementation Of Cashless Policy**

In the circular ***BPS/DIR/GEN/CIR/04/001,*** the CBN informed banks on the cashless policy review which occurred at the bankers' committee held on 8th February, 2017. In the Circular, Charges on deposits were re-introduced, Rates of deposit and withdrawal charges were reviewed effective from 1st April, 2017, depending on the category of states and 40:60 sharing of income generated between CBN and the banks. Also, existing exemptions remain sustained for government accounts, embassies, NGOs and banks were also advised to enlighten customers, train staff and communicate through media on cashless policy and e-payment options available.

7.6   **Circular to All Banks on Regulatory Guidelines for the   Redesigned Credit Risk Management System (CRMS) for Commercial, Merchant and Non-Interest Banks**

The CBN, in a circular referenced FPR/DIR/GEN/CRM/06/012 and dated 27th February, 2017, released a new Guideline on rendition requirements of CRMS reports regarding loan disbursement by Commercial, Merchant and Non-Interest Banks. The Guideline stipulated that the rendition requirement came into effect on 21st of February, 2017 when the system became operational, and that any breach of the requirement from 3rd April, 2017 would be appropriately sanctioned.

7.7 Immediate adoption of examiners' recommended provision and audit adjustment by the OFIs

In a circular referenced ***OFI/DIR/CIR/GEN/17/070*** to all Other Financial Institutions, the CBN directed the boards of each OFI to immediately pass into their ledgers, all necessary entries i.e. audit adjustment and/or examiners' recommended provision in the latest examination report and the same should also be reflected in the next monthly

report sent to the CBN. Adoption must be on immediate receipt of report by the board, failure of which will attract appropriate sanctions as applicable to the type of OFI.

7.8 Guidelines for the Regulation and Supervision of Non-Interest (Islamic) Microfinance Banks in Nigeria

The CBN issued a guideline in a circular referenced ***FPR/DIR/GEN/CIR/06/016*** with respect to the regulation and supervision of Non-Interest (Islamic) MFBs in Nigeria. The Guideline was developed to provide a common playing field between the conventional and non-interest MFBs as well as address issues covering the operations of Non-interest Financial Institutions (NIFIs); and drive financial inclusion by integrating to the formal sector, individuals, organisations and communities not covered by the conventional MFBs.

7.9 Guide to charges by banks and other Financial Institutions

In its effort to address the gap in the Guide to Bank Charges issued in 2013, the CBN in the circular referenced ***FPR/DIR/GEN/CIR/06/017*** released a reviewed Guide, which addresses the charges on various products and services that banks, other financial institutions and mobile payment operators offer to their customers. The reviewed Guide replaced the 2013 guide and took effect from May 1, 2017.

7.10 Circular to All Deposit Money Banks, Other Financial Institutions and Mobile Payment Operators on Guide to Charges by Banks and Other Financial Institutions

The CBN, in a Circular referenced FPR/DIR/GEN/CIR/06/017 dated 21st April, 2017, provided a Guideline on charges on various product and services that banks, other financial institutions, and mobile money operators offer to their customers. The Circular required these financial institutions to present any other product, services and/or charge not covered by the guideline to the Central Bank of Nigeria for prior written approval.

7.11 Letter to all Other Financial Institutions (OFIs) on rendition of returns on Anti-money Laundering and Combatting of Financial Terrorism (AML/CFT)

In its efforts to address the low level of submission of the above mentioned returns, the CBN in a circular referenced **OFISD/DIR/CIR/GEN/17/28**, reiterated the various types of returns, frequency and deadline of submission and a remainder of sanctions to be attracted upon failure to comply with the directive issued in the circular **FPR/DIR/CON/BOF/01/036** dated August 12, 2012.

7.12 Data Exchange Agreements with at Least Two Licensed Credit Bureaux in Nigeria

In a circular referenced **OFI/DIR/CIR/GEN/17/151,** the CBN drew attention of OFIs to the penalties attracted for non-compliance with the provisions of circular **BSD/DIR/GEN/CIR/04/014** of April 30, 2010 and circular **BSD/DIR/GEN/LAB/06/051** of November 14, 2013, which required all OFIs to establish Data Exchange agreements with Credit Bureaux, obtain credit reports prior to granting any facility, periodically determine each borrower's current exposure to the financial system and submit credit information on all customers, staff and directors to Credit Bureaux respectively.

The Central Bank also advised the OFIs to include a disclosure clause in the terms and conditions of account opening packs to obtain consent for continuous credit information sharing with Credit Bureaux.

7.13 Exposure Draft on the Framework for Licensing, Regulation and Supervision of Private Asset Management Companies in Nigeria

Further to the developments in the Nigerian banking industry, which necessitated the need for the licensing of Private Asset Management Companies (PAMCs), the CBN developed and released an exposure draft of the Framework for the licensing, regulation

and supervision of the PAMCs. The framework defined PAMCs, its scope of activities for PAMCs, licencing requirements, ownership and board composition, corporate governance, et cetera. The objectives of the framework are to:

i. assist the regulatory authorities in promoting soundness and stability of the Financial System,

ii. create a vehicle to acquire eligible assets of banks, Other Financial Institutions (OFIs), and Banks In-Liquidation,

iii. create an alternative source of liquidity for banks and OFIs,

iv. provide a platform for restructuring acquired eligible assets of banks, OFIs and banks in-liquidation,

v. minimize the systemic consequences of delinquent assets on banks and banks in-liquidation and;

vi. Allow private institutions to complement the role of AMCON.

7.14 Exposure Draft On The Regulatory Framework For Bank Verification Number (BVN) Operations And Watch-List For The Nigerian Financial System

In furtherance to its mandate for the development of the Nigerian Electronic Payments System, the CBN in a circular referenced **BPS/DIR/GEN/CIR/04/005** dated July 3, 2017, released the exposure draft on the Regulatory Framework for Bank Verification Number (BVN) operations and watch-List for the Nigerian financial system for review and comments by stakeholders. The Framework provides the Standard Operating Guidelines and Framework on Watch-list (for confirmed fraudulent banks' customers) for the Nigerian Financial System, while also identifying the participants and their roles in the BVN operations. The objectives of the Regulatory Framework are to:

- Clearly define the roles and responsibilities of stakeholders,

- define the Bank Verification Number operations in Nigeria,

- outline the process/operations of the watch-list and;

- Define access, usage and ownership of the BVN data, requirements and conditions.

FINANCIAL CONDITION AND PERFORMANCE OF DEPOSIT MONEY BANKS (DMBs) IN THE FIRST AND SECOND QUARTERS OF 2017

BY

RESEARCH POLICY & INTERNATIONAL RELATIONS AND INSURANCE AND SURVEILLANCE DEPARTMENTS

1.0 Introduction

During the periods under review, the Nigerian economy recorded a mixed performance for the two quarters. In Q1 2017, there was a slight improvement in crude oil production and prices, improved FX supply to end-users as a result of the new foreign exchange policy introduced by CBN, declined Headline inflation (year-on-year) by 0.94% to 17.78%, while the GDP had a negative growth rate of 0.52%. In Q2 2017 on the other hand, there was a similar growth pattern in most of the indices except GDP growth rate, which had a positive value of 0.55%, a figure that showed the economy was out of recession. Notwithstanding inflation and interest rate remained high, structural constraints such as high cost of energy and transportation negatively influenced production and prices.

Despite the enumerated challenges that faced the economy in Q1 and Q2, 2017, the DMBs still recorded growths in Total Assets of 1.96% in Q1 2017, while, Loans and Advances to Customers, declined marginally by 1.60%. Similarly, Loans and Advances to Banks decreased by 14.49%. On the Liabilities side, Total Deposits from Customers which constituted 59.64% of the Industry Total Liabilities decreased by 1.11%, while Shareholders' Funds increased by 8.66%.

Total Industry Assets recorded a marginal decrease of 0.15% from Q1 to Q2, 2017. Similarly, Investment Securities Held to Maturity declined by 12.73%. On the Liabilities side, Total Deposits from Customers which constituted 58.52% of the Industry Total Liabilities decreased by 2.02% Shareholders' Funds declined by 18.50%.

The rest of the paper comprises of three sections. Section Two presents the Structure of Assets and Liabilities; Section Three assesses the financial condition of insured banks; and Section Four is conclusion.

2.0   STRUCTURE OF ASSETS AND LIABILITIES

During the quarters under review, the Total Assets of the industry increased by ₦0.591trillion or 1.96% from ₦30.151 trillion in Q4 2016 to ₦30.742 trillion in Q1 2017, and decreased marginally by ₦0.45 trillion or 0.15% from ₦30.742 trillion in Q1 2017 to ₦30.697 in Q2 2017.

The increment in Q1 2017 could be attributable to the increase in Financial Assets Held for Trading, Investment Securities Available for Sale and Other Assets. The decrease in Q2 2017 could be attributed to the decline in Net Loans & Advances to Customers, Investment Securities Held to Maturity, Investment in Securities Available for Sale and Investment in Subsidiaries & Associates.

On the Liabilities side, Total Deposits from Customers had the highest component with 59.64% of the Industry Total Liabilities in Q1 2017.Similarly, Total Deposits had the highest component with ₦17.964 trillion. The structure of the industry's Total Assets and Liabilities for Q1 and Q2 2017 are presented in Table 1 and Charts 1A and 1B.

TABLE 1: Structure of Banks' Assets and Liabilities for Q1 and Q2 2017

Assets	Q1 2017 (%)	Q2 2017 (%)	Liabilities	Q1 2017 (%)	Q2 2017 (%)
Cash Balances	1.58	2.10	Deposit from Banks	3.73	4.57
Balances with Banks & Central Bank	19.26	20.29	Deposit from Customers	59.64	58.52
Loans & Advances to Banks	0.95	1.28	Financial Liabilities Held for Trading	0.19	0.27
Loans & Advances to Customers	46.54	44.99	Borrowings	8.84	9.44
Financial Assets Held for Trading	3.78	4.22	Debt Instrument	3.51	4.11
Investment Securities: Available for Sale	9.44	9.23	Other Liabilities	10.87	12.29
Investment Securities: Held to Maturity	7.36	6.43	Shareholders' Fund	13.22	10.79
Assets Pledged as Collateral	2.46	2.47			

Investment in Subsidiaries & Associates	1.06	1.05		-	-
Property Plant and Equipments	2.84	2.92			
Other Assets	4.72	5.00			
Asset Classifies as Held for Sale & Discontinued Operations	0.01	0.02			
Total	100.00	**100.00**	**Total**	**100.00**	**100.00**

Source: NDIC

Chart 1B: Structure of Banks' Assets For Q1 and Q2 2017
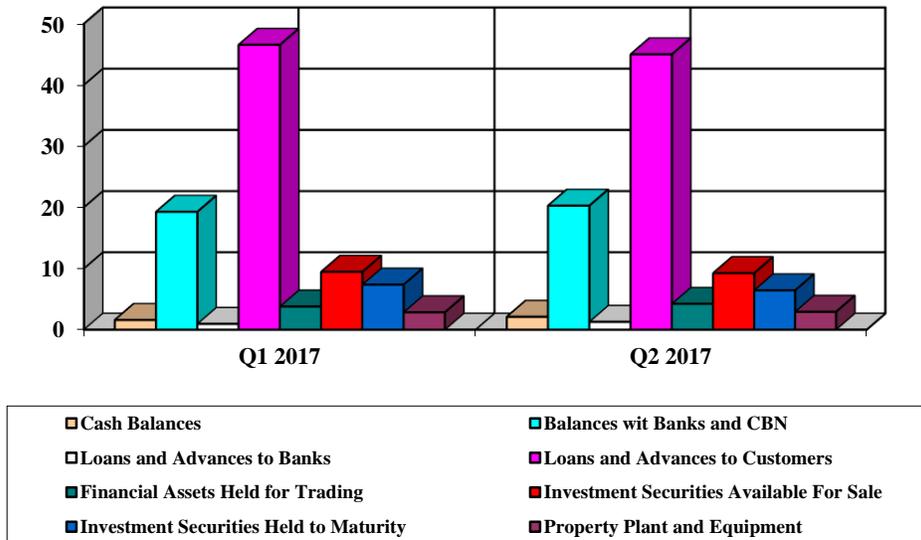
Source: NDIC

Chart 1B: Structure of Banks' Liabilities For Q1 and Q2 2017
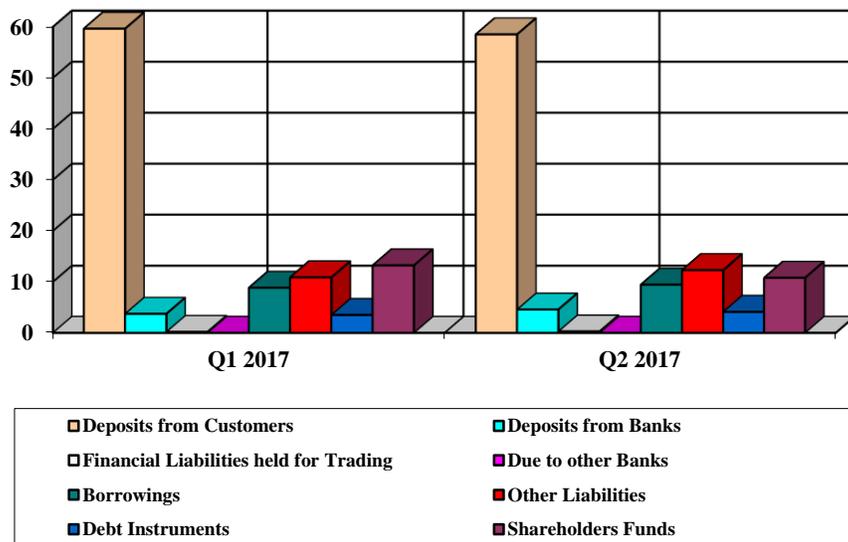
Source: NDIC

As can be seen from the Tables and Charts, on the Asset side, Loans and Advances to Customers had the highest component of 44.99% in Q2, and 46.54% in Q1, 2017. That represents a decrease of 3.49%. Balances with Banks & Central Bank had the second highest component with 20.29% and 19.26% in Q2 and Q1, 2017, respectively.

Furthermore, Investment Securities: Available For Sale accounted for 9.23% and 9.44%, Investment Securities: Held to Maturity accounted for 6.43% and 7.36% and Loans and Advances to Banks accounted for 1.28% and 0.95% for Q2 and Q1, 2017, respectively.

On the Liabilities side, Total Deposits from Customers had the highest component with 58.52% in Q2 and 59.64% in Q1, 2017. That showed a slight decrease of 2.02% over 59.64% in Q1 2017. Shareholders' Funds accounted for 10.79% in Q2 and 13.22% in Q1, 2017. Other Liabilities accounted for 12.29% and 10.97% for Q2 and Q1, 2017, respectively. Financial Liabilities Held for Trading had the lowest component of 0.27% in Q2 2017 and 0.19% in Q1 2017.

3.0   ASSESSMENT OF THE FINANCIAL CONDITION OF DMBs

3.1 Capital Adequacy

The banking industry Capital to Risk Weighted Assets Ratio (CAR) decreased from 14.78% as at the end of Q4 2016 to 12.92% as at the end of Q1 2017. Similarly, as at the end of Q2 2017, the CAR declined further from its Q1 value to 11.51% in Q2 2017.

At the end of Q1 2017, four (4) out of the twenty-five (25) banks in operation could not meet the minimum CAR requirement of 10% and 15%, for national and international banks, respectively. At the end of Q2 2017, five (5) banks could not meet the minimum requirement. The increasing levels of required provisions for credit losses, operating losses, and declining profits due to economic downturn among other factors could have precipitated the erosion of the industry capital base.

Table 5 and Chart 5 depict the CAR position of the industry for Q1 and Q2, 2017.

TABLE 5: Indicators of DMBs Capital Adequacy Position for Q1 and Q2 2017

Capital Adequacy Indicator	Period	
	Q1 2017 (%)	Q2 2017 (%)
Capital to Risk weighted Assets Ratio	12.92	11.51
Capital to Total Asset Ratio	9.19	7.32
Adjusted Capital Ratio	14.44	13.94

Source: NDIC

3.2 Asset Quality

Total Credit, which represented the bulk of the earning assets, decreased slightly by 0.69% from ₦16.258 trillion in Q4, 2016 to ₦16.146 trillion in Q1 2017. Out of the Industry Total Credits (TCs) of ₦16.146 trillion, Impaired Credits amounted to ₦2.184

trillion, representing 13.53% of TCs. That was an increase over the Impaired Credit ratio of 10.31% and absolute figure of ₦1.677 trillion recorded in Q4 2016. Similarly, in Q2 2017, Total Credit decreased slightly by 1.70% from ₦16.146 trillion in Q1 2017 to ₦15.871 trillion in Q2 2017. Out of the TCs of ₦15.871 trillion in Q2, Impaired Credits amounted to ₦2.387 trillion, representing 15.04%. That was an increase over the Impaired Credit Ratio of 13.53% recorded in Q1 2017.

During the periods under review, the Impaired Credit ratio of 13.53% in Q1 and 15.04% in Q2, 2017 both exceeded the maximum threshold of 5% prescribed by the CBN. The Q1 and Q2, 2017 Asset Quality indicators are shown in Table 2 and Chart 2.

TABLE 2: Asset Quality Indicators in Q1 and Q2, 2017

Details	Quarters	
	Q1 2017 (%)	Q2 2017 (%)
NPL Ratio to Total Loans	13.53	15.04
Provision for NPL to Total Loans	56.20	70.08
NPL to Shareholders' Funds Ratio	43.84	61.01

Source: NDIC

Chart 2: Indicators of Insured Banks' Asset Quality For Q1 and Q2, 2017

Legend:
- Non-performing Credit to Total Credit
- Provision for Non-performing Loans to Total Non-performing Credit
- Non-performing Credit to Shareholders' Funds
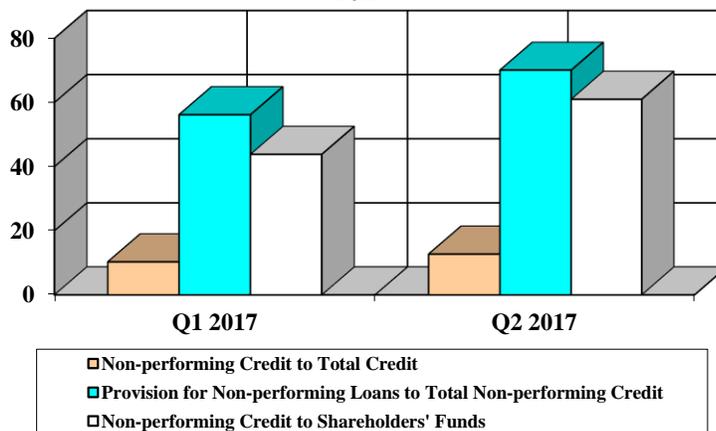
3.3 Earnings and Profitability

In Q1 2017, the Banking Industry recorded a Profit Before Tax (PBT) of ₦186.155 billion as against a profit of ₦74.160 billion recorded in Q4, 2016. That improvement is attributable to an increase in Net Interest Income by 59.45% from ₦285.111billion in Q4 2016 to ₦454.606 billion in Q1 2017 and a decline in Operating Expenses from ₦389.163 billion in Q4 2016 to ₦370.818 billion in Q1 2017. Similarly, Return on Assets (ROA) improved from 0.25% in Q4 2016 to 0.61% in Q1 2017. Return on Equity (ROE) also improved from 2.00% in Q4 2016 to 3.21% in Q1 2017.

Also, the Banking Industry recorded a PBT of ₦183.661 billion in Q2 2017 as against ₦186.155 billion recorded in Q1 2017. That represented a decrease of 1.34% or ₦2.494 billion and is attributable to a substantial decline in Net Interest Income from ₦454.606 billion to ₦431.773 billion and an increase of 7.40% in Operating Expenses from ₦370.818 billion to ₦398.254 in Q1 and Q2, 2017 respectively. Similarly, ROA and ROE fell slightly from 0.61% and 3.21% in Q1 to 0.40% and 2.85% in Q2, 2017, respectively. The Q1 and Q2, 2017 Earnings and Profitability indicators are shown in Table 3 and Chart 3.

Chart 3: Insured Banks' Earnings and Profitability For Q1 and Q2 2017
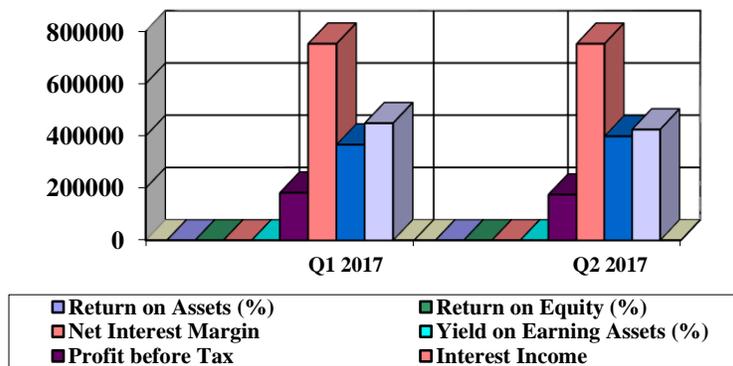
TABLE 3: **DMBs Earnings and Profitability Indicators in Q1 and Q2 2017.**

Parameters	Q1 2017	Q2 2017
Return on Assets (%)	0.61	0.40
Return on Equity (%)	0.03	0.83
Net Interest Margin	0.02	0.68
Yield on Earning Assets (%)	0.02	0.02
Profit Before Tax (N' billion)	182,230	175,153
Interest Income (N' billion)	752,419	752,136
Operating Expenses (N' billion)	366,216	398,253
Interest Expense (N' billion)	304,041	327,856
Net-Interest Income (N' billion)	448,378	424,280

Source: NDIC

3.4 Liquidity Profile

In Q1 2017, Average Liquidity Ratio (ALR) of the Banking Industry increased slightly from 43.93% in Q4, 2016 to 45.36% in Q1 2017. Also, the Net Credit to Deposits ratio decreased from 87.29% in Q4 2016 to 76.15% in Q1 2017. That can be attributed to a decrease in Net Credit from ₦16.183 trillion in Q4 2016 to ₦13.962 trillion in Q1 2017. In the Q2 2017, the ALR increased significantly from 45.36% in Q1 2017 to 65.85% in Q2 2017. The ALR and other figures are shown in Table 4 and Chart 4.

During the periods under review, (5) five banks fell below the 30% threshold in Q1 2017, while three (3) banks fell below the 30% threshold in Q2 2017.

TABLE 4: Indicators of Insured Banks' Liquidity Profile for Q1 and Q2 2017.

Parameters	Quarters	
	Q1 2017 (%)	Q2 2017 (%)
Average Liquidity Ratio	45.36	65.85
Net Credit to Deposit Ratio	76.15	80.47
Inter-bank taking to Deposit Ratio	4.52	2.45
No of Banks with Liquidity Ratio below the prescribed minimum	5	3

Source: NDIC

Chart 4: Indicators of Insured Banks' Liquidity Profile For Q1 and Q2 2017

□ Average Liquidity Ratio (%)
□ Net Loans to Deposit Ratio (%)
□ Inter-bank taking to Deposit Ratio (%)
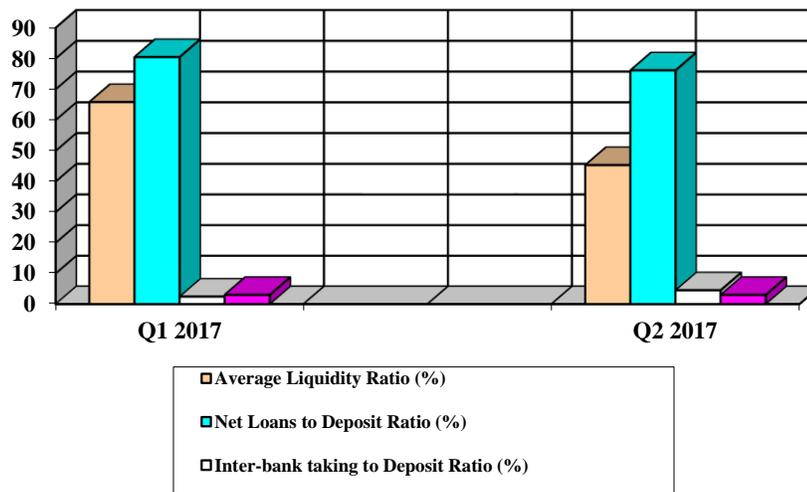
3

4.0 Conclusion

Considering the fact that the DMBs average liquidity and capital adequacy ratios were above the prescribed threshold indicated that the banking industry remained stable and sound, though the harsh economic environment under which it operated impinge negatively on their asset quality.

Equity Market Hedge Potentials: Evidence from Nigeria and Malaysia

Suleiman Tahir

Abstract

Despite the importance of the equity market in providing capital investments, not much has been achieved in terms of identifying a hedge instrument for the associated market risk. This paper examined the potential for volatility transmission between Nigerian stock index and gold spot and made a comparative assessment of gold spot in providing the Nigerian and Malaysian stock markets with a volatility hedge. Diagonal BEKK multivariate GARCH model was applied to examine volatility transmission between the two countries' stock indices and gold spot. Outcome of the study confirmed the existence of volatility hedge potential for the two countries stock indices from gold spot. The outcome provided a wider implication for the Nigerian banking stock index especially given its remarkable appreciation in recent time.

1.   Introduction

Stock markets normally have a dominant influence on the economy of a country, this is largely due to their position in capital market investments. On the other hand, the Nigerian banking sector has in recent years become an important source of the country's stock market capitalisation (Tahir, Adegbite & Guney, 2016). Tahir et al. (2016) have found stock market indices of both Nigeria and Malaysia to have reacted positively to banking sector recapitalization. In spite of this development not much attention has been paid to identifying a risk hedge for the Nigerian stock market index and by implication the banking subsector index. A number of empirical studies examining interdependence between stock market return and gold spot have suggested various interesting outcomes. Studies in Mensi, Beljid, Boubaker and Managi (2013); Thuraisamy, Sharma and Ahmed (2013); Ciner, Gurdgiev, and Lucey (2013); Sadorsky (2014); Arouri, Lahiani and Nguyen (2015) are among few others recently added to the growing list of literature in the area.

Arouri et al. (2015) specifically focused on understanding volatility spillover between gold spot and the Chinese stock index using multivariate GARCH approach. The study found evidence of volatility spillover between gold prices and stock prices, the result thus suggested stock index volatility hedge from gold spot. Ciner et al. (2013) have found gold spot to provide safe haven against exchange rates in the UK and US and suggested the commodity as having a monetary asset role. Sadorsky (2014) examined potential for increased diversification of investment portfolio and found gold spot to jointly provide countries with stock markets safety. Given the focus of the preceding studies, expanding investigations of specific equity market's interdependence with gold spot may provide further alternative. Thus, the objectives of the current paper is to contribute to the existing literature in two major ways.

First, the current paper's objective is to examine volatility transmission between the Nigerian stock index and gold spot. Arouri et al. (2015) have found evidence of volatility transmission between the Chinese stock index and the gold spot, but we are yet to see similar endeavour in the Nigerian instance. In addition to doing this, further dimension of the current paper will examine the stock market's activities in relation to the gold spot, an approach which will measure wider implication for the economy. This could be as intermediated through the health of the banking sector, which provides a further means to address the dependence of the economy on the banking sector. Thus, the essential element of studying risk and return which is central to Markowitz's mean-variance theory (Markowitz, 1952) and largely linked to the stock market activities is relevantly extended to understanding the effect of gold price on the stock market volatility. Also, this will have implications for attaining a hedge potential for stock market's price volatility. Empirical process in Ciner et al. (2013) has already suggested gold spot as having the potential in providing investment safety. Another implication here will be to check the potential of the gold spot to provide the Nigerian banking stock subsector index with a volatility hedge.

The second objective of this paper is to examine a comparative potential of gold spot in providing different stock markets with volatility hedge. Despite the rich blend of preceding studies looking into how gold spot affect the stock markets, doing this in the context of different countries stock indices is yet to be fully realised. For instance, the application of gold spot interdependence with the stock market returns of developing economies is not much covered. Again, expanding such investigation to simultaneously include gold spot together with the equity returns of another country looking into investment alternative has not been achieved. By jointly studying the dynamic relationships of emerging markets stock prices with other commodities, Sadorsky (2014) provided the necessary common ground to seek the understanding of how gold spot could jointly provide countries with stock markets safety. Therefore, by jointly examining the Nigerian and Malaysian stock indices, this paper hopes to achieve a comparative analysis of the two countries stock indices reaction to gold spot.

Therefore, the focus of this paper is to have a broad application of gold spot interdependence with equity market indices. Broadly speaking, the investigation here will focus on understanding volatility transmission between gold spot and stock market returns and examination of the outcome to see if such information could provide a useful means of hedging stock market indices. Ciner et al. (2013) has provided us with evidence of gold spot providing a hedge potential for stock market among other tested assets. Also, the empirical process in Smales (2014) utilised the information flow inherent in the gold futures market as a source of explanation for traders selling and buying positions. These outcomes are aimed to be extended in this paper by examining the case of Nigerian and Malaysian stock indices, while highlighting the potential implications for the Nigerian banking sector recently seen making substantial contribution to the country's stock market capitalisation. In addition to this section, the remainder part of the paper is organized to include; a review of related literature which scrutinized the existing studies in the area for the purpose of expansion, methodology and model section which

presented the model of estimation, data section which explain the choice of investigated variables, data analysis and results section presented the studies' findings, lastly implication and conclusion section analysed the findings and offered relevant suggestions.

2. A Review of Related Literature

The main concerns for a capital market investor are risk minimisation and guaranteeing efficient return. However, the problem of return volatility makes the associated risk issue of enormous concern. These related issues are central to the mean-variance efficiency consideration of Markowitz (1952), an issue which Sharpe (1964) effectively tried to solve with the Capital Assets Pricing Model (CAPM). To this date, the essential element of studying risk and return is largely linked to stock market activities, and this interest has been extended in several studies. Karolyi (1995) when estimating the volatility transmissions between the United States and Canada, highlighted the implication of such study for the asset pricing. Also, Smales (2014) utilised market information, specifically news sentiment to determine returns in gold futures market. However, despite the contributions of the extant studies, there is an apparent need for the understanding of wider economic implications of stock index and gold spot spillover, particularly in the way it may provide hedge for stock index volatility and by implication for the banking subsector index.

Studies focusing on the relationship between stock price and gold spot are in the increase, Agyei-Ampomah, Gounopoulos and Mazouz (2014); Degiannakis, Filis, and Kizys (2014); Arouri et al. (2015); Kang, Ratti and Yoon (2015) are among few others . For instance, Arouri et al. (2015) have found evidence of volatility transmission between the Chinese stock index and the gold spot. In the same vain, Agyei-Ampomah et al. (2014) have found gold to be useful hedge of stock price volatility. A possible deduction here could focus on understanding if investing in gold spots could provide an alternative to stock market investments. This is given the empirical study in Tully and Lucey (2007) focused on the interdependence between gold price and stock market behaviour. Roache and Rossi

(2010) examined gold as an investment alternative by analysing the responses of other commodities' prices associated with bad news in relation to gold, especially during economic downturn. Understandably, the analysis focused on gold providing other commodities with the necessary hedge, as gold is perceived to be the deposit of last resort. Empirical evidence in Ciner et al. (2013) suggested that gold spot could be used as safe haven for exchange rate and can also have monetary policy role. The essential element here is that of inferring alternative investment potential.

Using a multivariate GARCH approach, Malik and Ewing (2009) have found a potential for cross-market hedging when they investigated volatility transmission between oil prices and Dow Jones equity sectors and claimed to have found evidence in support of cross-market hedging. Their approach of single market focus is limiting and should be expanded in the direction of cross-country context and also to look at gold spot in place of oil price. This is particularly given the approach in Sadorsky (2014) which paid attention to the financial integration between countries with the potential for investment diversification. Thus, it is essential to investigate volatility transmission between stock indices of similar jurisdiction against gold spot and a further dimension to the development will be an examination of the outcome to see if such information could provide a useful hedging for stock index volatility. Baur and Lucey (2010) have attempted something similar when they examined the potential of gold providing stock indices of US, UK and Germany with volatility hedge, but we are yet to witness such a study in the context of developing countries like Nigeria and Malaysia.

Although extant studies have covered the interdependence between gold spot and stock markets of other countries (Tully & Lucey, 2007; Mensi et al., 2013; Thuraisamy et al., 2013; Arouri et al., 2015), still not much has been achieved in terms of studying the impacts of such interdependences on the stock market returns of developing economies. Jointly examining different counties situation will create an avenue to contrast the ability

of different economies stock markets reaction to gold price changes, particularly as we know that countries are endowed with different economic characteristics. For instance, Nigeria as a developing economy has a different mode of stock market development as compared to another developing country like Malaysia. While the Malaysian economy has a better developed stock market with wider sectorial capitalisation, the country parades a smaller size economy compared with Nigeria. Nigeria with a population of over 180 million is a bigger economy with potentially broader activities than Malaysia. Thus, given this diverse nature of the two countries' economies, their stock markets could be examined for a potential variety of reactions to changes in gold spot. Hence, the essential elements of business activities and health of the different economies under stock indices and gold price changes could be understood by this means.

3.   Methodology and Model

Given the current paper's target of examining volatility transmission between stock indices and gold spot, the empirical process being adopted is the multivariate GARCH model of diagonal BEKK first proposed by Engle and Kroner (1995). The BEKK model is applied because of its ability to restrict the parameter space volatility while remaining sufficiently flexible in data generating process (positive definite parameterisation).

The diagonal BEKK model presentation typically begins with the specification in equation (1) below:

$$H_t = B_0^{\wedge'} B_0 + B_i^{\wedge'} \varepsilon_{(t-i)} \varepsilon_{(t-i)}^{\wedge'} B_i + C_j^{\wedge'} H_j^{\wedge'} C_j \qquad (1)$$

Where; B_0 = n x n symmetric parameter matrices. B_i and C_j = n x n unrestricted parameter matrices. The model specification in equation (1) has a dynamic feature that enables the conditional variances and covariance to influence each other, again requiring estimation of smaller number of parameters. This enables the model to meet the restriction condition of the parameterisation, where $p = q = 1$. In its practical implementation, the BEKK is normally applied given a diagonal representation which avoids complications related to large parameterisation, as specified below.

$h_{(11,t)} = a_{01} + a_{11} \varepsilon_{(1,t-1)}^2 + \beta_{11} h_{(11,t-1)}$ (2a)

$h_{(12,t)} = a_{02} + a_{22} \varepsilon_{(1,t-1)} \varepsilon_{(2,t-1)} + \beta_{22} h_{(12,t-1)}$ (2b)

$h_{(22,t)} = a_{03} + a_{33} \varepsilon_{(2,t-1)}^2 + \beta_{33} h_{(22,t-1)}$ (2c)

Where; $h_{(11,t)}$ and $h_{(22,t)}$ = conditional variances for the different series, here stock index and gold prices. Each represents the GARCH process used in assessing the impact of one series shock on the volatility of itself. $h_{(12,t)}$ = conditional covariance equation. This could simultaneously assess the effect of the shocks and volatility impact on both series, thereby capturing the impact of cross volatility or volatility spillover between the two series of gold price and stock market return, as against the one direction test exhibited by the conditional variance process.

a_{01}, a_{02} and a_{03} = are the constant coefficient matrices testing the mean return of the different series, given as indefinite matrices. $a_{(11}$) 〖,a〗 $_{22}$ and a_{33} = coefficient matrices for the series ARCH terms, given as diagonal matrices. β_{11}, β_{22} and β_{33} = coefficient matrices for the series GARCH terms, also given as diagonal matrices. All coefficients capture the level of impact of the shocks being measured. Here, the restriction imposed based on the parameters B_i and C_j in equation (1) above will see $a_{22} = a_{11}* a_{33}$ and $\beta_{22} = \beta_{11}* \beta_{33}$ in equations (2a) and (2c), resulting into the covariance coefficients in equation (2b). ε_1^2 and ε_2^2 = unexpected volatility or shock, capturing the effect of news on each model or series and seen as a direct effect of shock. $\varepsilon_{(t-1)}^2$ = past volatility news or shock. $\varepsilon_{(1,t)} \varepsilon_{(2,t)}$ = cross effects of news, as originated from any of the series and affecting the other, seen as indirect effect of news.

4.   Data Presentation

The applied data in this paper is from Gold spot (GLD), the closing prices of Malaysian stock index (MAS) and Nigerian stock index (NIS). All data are in daily (weekdays) frequencies beginning from March 1996 to November 2016, translating to over 20 years daily observations and were accessed from the Thomson Reuters Datastream. The stock

indices and gold spot used is the Standard and Poor's index whose choice was based on wider application in the extant literature, see Mensi et al. (2013) for evidence of past application. Stock market indices are being applied against the stock market returns approach in the existing literature given that the chosen BEKK model in this study allow for the freedom to make such choice. This logic is against other Multivariate GARCH modelling processes which assume returns are generated by conditionally heteroskedastic underlying factors. The Nigerian data is applied being the primary country of interest in this paper, whereas the Malaysian data is being applied to get a contrasting view of the study outcome. Thus, for common comparison and generalisation, data for the Malaysian stock market is also employed.

Further justification for the countries of choice in this research is that both Nigeria and Malaysia have experienced banking sector recapitalisation in recent time. This has led to extensive capital market borrowing activities by the countries' banks (Sufian, & Habibullah, 2013; Tahir et al., 2016). Again, like Nigeria, Malaysia is a developing country with a stock market that is at similar age of development. This combination is purposely intended to give room for comparative analysis of the different countries' equity markets reaction to gold spot, thus creating an avenue for broader comparison. However, in as much as we draw a motivation to jointly examine the different countries given their similar economic situation, we will create an avenue to control for the ability of the different economies reaction to different situations. For instance, we have already seen how Nigeria as a developing economy can have a different mode of stock market development as compared to Malaysia. Thus, the choice of the two countries is due to their status of being at similar level of economic development and other close characteristics.

Gold spot is applied to capture the alternative investment avenue and for consideration of a commodity which may not be serially correlated with stock return. The applied data were equally chosen with specific consideration of their ability to fit into the empirical model specified in the above empirical section and also to adequately provide for the

research contribution in this paper. For instance, to address the question relating to finding volatility transmission between gold spot and stock market indices, both Malaysian and Nigerian stock indices are employed. Extant studies have approached the issue of data selection based on the research questions being answered. Basher and Sadorsky (2006) applied the closing stock index of selected emerging stock markets and world stock index. Thus, significant consideration was paid to the data type in extant studies. Preceding studies have applied gold spot and a mixture of different stock market indices. See additional examples in Tully and Lucey (2007), Mensi et al. (2013) and Thuraisamy et al. (2013), Arouri et al. (2015).

5.   Data Analysis and Results

The applied data in this paper will be analysed in their natural log form. This is partly to help address the issue of applied variables being not near to normal distribution and also, the different datasets being far apart from each other in absolute values. The data analysis begins with preliminary analysis within which the applied data series' descriptive statistics and correlation matrix are reported. Tables 1 and 2 below present the results for data series descriptive statistics and correlation matrix. Table 1 presents descriptive statistics of variables in our data sample. All data series seems generally stable given the range of deviation from minimum to maximum. Again other indicators like probability values are significant.

Table 1: Variables Descriptive Statistics

Series	Mean	Median	Maximum	Minimum	Std. Dev.	Probability
GLDt	6.0511	6.2338	7.0044	5.0066	0.6253	0.0000
MASt	5.6797	5.7784	6.2829	4.8653	0.3996	0.0000
NISt	10.0506	10.1168	11.1030	8.5933	0.5343	0.0000

In Table 2 it can be seen that all variables in the dataset are significantly correlated. For instance, the relationship between gold spot (GLDt) and that of Malaysian stock index (MASt) returned a coefficient of 0.9324 which is highly significant. This means that both gold spot and the Malaysian stock index move together in the same direction.

Table 2: Variables Correlation Matrix

	GLDt	MASt	NISt
GLDt	1.0000		
MASt	0.9324*	1.0000	
NISt	0.6645*	0.6769*	1.0000

*indicates statistical significance

The main data analysis is construed given relationships which measures interactions between; gold spot against Nigeria stock index and gold spot against Malaysian stock index. The process examined the conditional mean, variance and covariance between gold spot and Nigerian stock index and gold spot and Malaysian stock index. Table 3 reports the data series conditional mean. Given the level of significance of coefficients in the conditional mean equations of the data series, we have established them as being mean efficient. This signifies that, given gold spot influences in the considered countries, stock market returns are at the efficient level, as the conditional means are significant in each case.

Table 3: Conditional mean

Estimated Equation	Coefficient	Std. Error	z-Statistic	p-Value
$⟦NIS⟧_t = α\_01$	10.0435	0.0021	4672.0346	0.0000
$⟦GLD⟧_t = α\_03$	6.1185	0.0059	1038.2210	0.0000
$⟦MAS⟧_t = α\_01$	5.8519	0.0016	3640.9138	0.0000
$⟦GLD⟧_t = α\_03$	6.4776	0.0021	3104.1200	0.0000

Estimated relationships are based on equation (2a and c); $⟦Δly⟧_t = α\_01$, where α_01=Indefinite matrix. **indicates significance at 1% and *indicates significance at 5%. Turning to examining volatility transmission among the tested variables, Table 4 below presents the summary of conditional variance and covariance of our data series. Panels A and B in column 1 of the Table presents series' interactions between gold spot and stock indices of Nigeria and Malaysia respectively. In all instances of conditional variance and covariance equations we have the coefficients' z-statistics written in parenthesis. The

observed z-statistics relating to the GARCH 1 (Nigerian stock index series) and GARCH 2 (gold spot series) in Panel A returned significant relationships. Also, in Panel B, the GARCH 1 (Malaysian stock index series) and GARCH 2 (gold spot series) returned significant relationships in all instance. Thus, we can conclude given the level of significance in all the conditional variance coefficients of the series' equations, that the conditional variances of each series has influence on itself. Hence, the effect of volatility in the gold market and both of the examined stock markets has self-impact.

The coefficients significance measured by the z-statistics in conditional covariance equation (h12,t) are applied in measuring volatility transmission between stock indices and gold spot. In Table 4, we have conditional covariance coefficients in respect of the $α11$, $α22$ and $α33$ (ARCH terms coefficient matrices) in all relationships (Panels A and B) having significant z-statistics. Thus, there are volatility transmissions between the data series relationships characterised in Panel A (Nigerian stock index and gold spot) and Panel B (Malaysian stock index and gold spot). Again, the conditional covariance interactions of the GARCH terms ($β11$, $β22$ and $β33$) in all relationships seen from Panel A and B have significant z-statistics measure of their coefficient. Therefore, we can conclude that there is a volatility transmission between the data series relationships seen from Panel A and B. Consistent with past studies (e.g. Arouri et al., 2015) the outcome of this papers empirical process has confirmed the existence of volatility transmissions between the tested series and thus suggesting a hedge potential for the stock indices of the examined countries (Nigeria and Malaysia). Hence as Roache and Rossi (2010) found gold spot to be able to act as an investment alternative and the outcome in Ciner et al. (2013) which suggested gold spot could be used as safe haven, the outcome of the current paper has found the potential of volatility hedge in gold spot.

Table 4: Conditional Variance and Covariance

Series Interactions	Equation	α01, α02, α03	α11, α22, α33	β11, β22, β33
1	2	3	4	5
Panel A:	GARCH1 (h11)	6. 8x10-5 (22.12)	0.9127 (5.78)	0.1092 (7.53)
Nigeria Stock Index and	Covariance (h12)	0.0001 (23.73)	0.9647 (5.88)	0.0841 (7.20)
Gold spot	GARCH2 (h22)	0.0003 (18.60)	1.032 (6.06)	0.0553 (6.77)
Panel B:	GARCH1 (h11)	0.0001 (26.95)	0.9062 (8.14)	0.1102 (8.91)
Malaysia Stock Index and	Covariance (h12)	5.1x10-5 (13.12)	0.9051 (8.13)	0.1113 (8.96)
Gold spot	GARCH2 (h22)	0.0001 (23.77)	0.9047 (8.12)	0.1118 (8.95)

Notes: h11 and h22 are conditional variances for the estimates with each representing the GARCH (1,1); h12,t is conditional covariance; α01, α02 and α03 are the constant coefficient matrices; α11, α22 and α33 are coefficient matrices for the ARCH terms; β11, β22 and β33 are coefficient matrices for the GARCH terms. Figures in parentheses are z-statistics which measures level of significance. All other non-substituted elements of the regressions are as defined in the model specification in equations 2a, 2b and 2c.

6.   Conclusion

This paper examined the potential for volatility transmission between Nigerian stock index and gold spot, the paper also made a comparative assessment of gold spot in providing different stock markets (Nigeria and Malaysia) with a volatility hedge. The overall outcome confirmed the existence of volatility transmission between gold spot and stock market indices of Nigeria and Malaysia, thus indicating a volatility hedge potential for the two countries stock indices from gold spot. This outcome is consistent with extant studies which found gold spot as suitable volatility hedge/safe haven (Roache & Rossi, 2010;

Ciner et al., 2013). The comparative assessment of volatility transmission between the Nigerian and Malaysian stock indices to gold spot is also suggestive of similar pattern of responses of the two countries stock indices to gold spot. However, the covariance transmission between the Nigerian stock index and gold spot seems to be more responsive than the one between the Malaysian stock index and gold spot. These varying outcomes should be expected given the different characteristics of the two countries' economies. In the case of Nigeria, the outcome is expected given that the country has a less developed stock market with a lot of room for expansion. This situation is different as compared to the case of Malaysia which has a better diversified economy with flourishing manufacturing and services sectors, this is in addition to the presence of other viable export commodities like palm oil and tin. This situation could explain why the Malaysian stock market return may not have responded to the gold spot the way the Nigerian stock index did.

The outcome of this study has wider implication on the economies of the examined countries, economic policy and further academic engagements. That is to say, in addition to providing hedging information for the examined countries stock markets, other sectors of the examined countries' economies can also benefit from the outcome of this study. For instance, the uncovered hedge potential of gold spot on the Nigerian stock index will be useful for hedging the banking subsector stock index of the country. This is given its remarkable appreciation in recent time, an achievement which led the subsector to becoming the biggest gainer of the market. Thus, the practical presence of the Nigerian banking sector as a financial intermediator could be better protected by taking advantage of the outcome in this study. Thus, policy makers and regulators of the Nigerian banking sector must focus on the identification of hedge mechanism capable of managing the volatility risk associated with the unusual growth of the country's banking subsector stock index which happened in resent time. In this regard, future studies in this area should be geared towards utilising banking specific variables in measuring the potential direct effect

of stock market volatility on the banking sector and its rising stock market investment. Hence, a further dimension here shall include wider business activity measured by stock indices. This could be as intermediated through the health of the banking sector, which provides a further means to address the dependence of the economy on the sector. Other extensions will be to assemble and study portfolio of other assets with gold spot included, this will be geared towards determining other assets capable of optimally hedging the volatility risk for banking subsector stock index.

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Determinants of Bank Failure in Nigeria: An empirical Investigation By Prof. Haruna Mohammed Aliero and Paul Ache

ABSTRACT

This study investigates the determinants of bank failure in Nigeria from 1970-2013. It uses Autoregressive Distributed Lag (ARDL) approach in the analysis and further examines the extent to which these determinants lead to bank failure in Nigeria. The study found that there is significant long run relationship between bank failure and exchange rate, interest rate, capital adequacy ratio, non-performing loans and liquidity ratio, but an insignificant relationship with inflation in Nigeria. On the direction of causality, the study found a bidirectional causal relationship between bank failure and, capital adequacy ratio and non-performing loans (NPL), while a unidirectional causal relationship was found between bank failure and exchange rate but shows no causal relationship between bank failure and, inflation and interest rate. The study therefore conclude that bank failure is mainly determined by capital adequacy ratio (CAR), exchange rate, interest rate and liquidity ratio in Nigeria, and that Non-Performing Loans (NPL) undermines financial sector thereby making the financial institutions vulnerable to failure. It is recommended that monetary authorities in Nigeria should ensure that all banks operating in the country comply with the CAR guideline to guard against sudden bank failure, and that financial institutions should make sure that all necessary checks prior to the advancement of credit such as adequate collateral and viable financial projection be dully carried out and satisfied in order to forestall the incidence of bank failure in Nigeria.

Key words: *Determinants, bank failure, Non-performing loans, CAR, ARDL, Nigeria*

1. Introduction

The problem of bank failure has gained prominence over the years as a result of the realization of the continuing importance of the banking sector to effective economic functioning, growth and development. The extent and depth of bank failure can be generalized or systemic in dimension. Generalized failure exists when its occurrence spread fast and cuts across in terms of the ratio of total deposits of failed institutions to total deposits of the industry. On the other hand, the problem may become systemic when its prevalence and contagious effects become endemic and pose threats to the stability of the entire system. Under this situation, public confidence in the system would

be completely eroded (Abdullahi 2002). It is therefore natural that issues surrounding the operations of banks, as well as their problems would resonate among scholars and researchers.

Statement of the problem

Though previous studies such as Waweru and Kalani (2009), Egbo (2012), Mayuku and Ohwofasa (2012), Ogude *et al* (2012) and, Calomiris and Mason (2003) were carried out to analyze and appraise bank failure, the major determinants of this failure were not exhaustively discovered and investigated, as the studies dwelt mainly on the impact and consequences of bank failure while paying little attention to enunciating the major determinants. Specifically, Calomiris and Mason (2003) analyzed the consequences of banking crisis on an economy, Demirguc-Kunt and Detragiache (1998) did an analysis of the determinants of banking crisis in developed and developing countries. The former emphasized on the consequences, and not the determinants of bank failure in the U. S. during the World Economic Recession of 1930 covering a period of 3 years which can be said to be too small for any study to come up with credible findings and make viable contributions. The latter had a scope that can also be said to be limited both in terms of the period and the number of banks captured in the study. Furthermore, the methods adopted by these studies also cast doubt on the validity of their findings as they used discrimant approach which relied on the probability of a failure occurring or not. On the other hand, Waweru and Kalani (2009) carried out a study on commercial banking crisis in Kenya pointing to the fact that Non-Performing Loans (NPL) accounted for the crisis thereby leading to failure. It is a fact that NPL could be a factor leading to bank failure, but it can certainly not be the only factor as advanced by the above study.

Furthermore, Egbo (2012) examined the universal basis for bank failure using Nigeria as a case study. Though this study is relevant to Nigeria's financial system, however, the findings cannot be said to be worthwhile as there was no stated clear-cut methodology.

Mayuku and Ohwofasa (2012), investigated the determinants and impact of bank distress/failure on Nigerian economy, the authors in the study, argued that macroeconomic variables such as inflation rate, real exchange rate, interest rate and GDP can best explain bank failure in Nigeria. However, as a rule of thumb, bank failure cannot be adequately examined without putting into consideration some bank specific variables such as Capital Adequacy Ratio (CAR), Liquidity and Non-Performing Loans (NPL). Similarly, Ogude *et al* (2012) carried out an appraisal of the impacts of bank failure on Nigerian economy. The study opined a negative impact between bank failure and Nigeria's economy but unable to unravel the factors leading to this failure. This current study however, is set to examine such factors that are assumed to be responsible for bank failures and the extent to which each one of them could explain bank failure. In achieving this objective therefore, the study is divided into five sections., including this introductory section. Section two reviews related literature, section three presents the methodology employed , section four presents the results while section five concludes and offers policy recommendations/ .

2.0 Review of empirical literature

Several empirical studies investigated bank failure and related issues but the concern of this study is on bank failure. Never the less, there are quite a number of studies on bank failure such as Mayuku and Ohwofasa (2012), Adeyemi (2011), Chete (2001), Kunt and Detragiache (1998), Adeyeye *et al* (2012) and Adebiyi (2012), which have touched on some determinants of bank failure. In reviewing literature for this study, the specific factors that determine bank failure were treated one after the other.

2.1. Inflation

Mayuku and Ohwofasa (2012) examined the determinants of bank distress and their effect on Nigerian economy from 1986 to 2011. The objective of the study was to identify the major determinants of bank distress in Nigeria a well as their impact on the economy.

It employed the use of Johansen model for co-integration and found that inflation which is one of the macro-economic variables plays a significant role in determining bank failure in Nigeria. The study found that inflation rate in the economy was a potent source of bank failure in Nigeria. In a different study, Demirguc-Kunt and Detragiache (1998) investigated major determinants of bank distress and attempted identifying features of failed banks in developing countries using multivariate logic econometric model and panel data. The study established that crises tend to erupt when the macroeconomic environment is weak, particularly when growth is low and inflation is high. Augmenting the above view is the study of Brenda *et al* (1997) which examined the determinants of banking system fragility, a case study of Mexico using survival analysis and quarterly data for 1991 to 1995. They found that the degree of soundness of banks or their probability of failure is determined by bank-specific factors as well as macro-economic conditions, such as high inflation, and the overall fragility of the banking system when systemic risk is present. In another study, Chete (2001) examined the role played by macro-economic variables in the Nigerian banking crises, with more emphasis on inflation, interest rate, exchange rate and liquidity ratio. The study employed discrete-time hazard model and logistic regression analysis. The study revealed that the process of financial liberalization contributed to banking sector fragility. By the same logic, the implied macroeconomic management mirrored by the inflation coefficient impacted negatively on banking sector soundness in a significant way.

2.2 Exchange Rate

Ogude *et al* (2012) examined bank distress determinants in Nigeria with particular emphasis on revealing the contributions of macroeconomic variables to the crisis. The study made use of multiple regression analysis with Error Correction Model (ECM) and the co-integration test indicated that the real exchange rate in the economy contributes to distress among Nigerian banks, though the extent of impact was shown to be non-significant. In a similar study, Chete (2001) examined the role played by macro economy

in the Nigerian banking crises using discrete-time hazard model and logistic regression analysis. The study showed that real exchange rate enhances bank fragility and consequently bring about crises in the financial sector. Though the real exchange rate played a lesser role on the probability of a banking failure, depreciation is adversarial to banking sector soundness.

2.3 Interest rate

Raulin (2009) analyzed the theory of linkage between monetary policies and bank failure in developing countries using specific data. It was revealed that increase in interest rates induces an increase of asymmetric information. An efficient bank should decrease its loan portfolio to deal with asymmetric information. The study showed that if the interest rate is so high to the extent that loan portfolio should be null there will be a banking crisis. According to the study, there is a threshold of interest rate which is referred to as a threshold of crisis, which the interest rate on the treasury bills should not exceed.

Kobir (2011) investigated the relationship between interest rates and financial performance of commercial banks in Kenya using multiple regressions and a time series data of 2006 to 2010. The findings of the study revealed that interest rates have an effect on financial performance of commercial banks in Kenya. The study used regression analysis to establish the relationship between interest rates and Return on Earnings (ROE). The results obtained from the study shows that there is a positive relationship between interest rates and financial performance of commercial banks in Kenya. It recommended that Banks should therefore prudently manage their interest rates to improve their financial performance. The analysis shows that the effect of interest rates on profitability is not significant in the short term for all the banks.

Englund (1999) analysed Swedish banking crisis, roots and consequences. The study used country specific data. The study revealed that subsequent crises resulted from a highly

leveraged private sector being simultaneously hit by three major exogenous events: a shift in monetary policy with an increase in pre-tax interest rates, a tax reform that increased after tax interest rates, and the ERM crisis. The study also indicated that combined with some overinvestment in commercial property, high real interest rates contributed to breaking the boom in real estate prices and triggering a downward price spiral resulting in bankruptcies and massive credit losses.

2.4 Capital Adequacy Ratio

Okezie (2011) investigated capital adequacy ratio as a predictor of bank failure in Nigeria. It employed time series data from 1991 to 2004 using Early Warning Systems (EWS) model. Autoregression and Granger Causality tests were employed to examine capital ratio as predictor of distress. The study revealed that capital adequacy ratio predicted bank distress significantly and the continued use of capital adequacy ratio in the prediction of bank distress was recommended by the study. The study also revealed that leverage capital ratio and the gross revenue capital ratio may be used to replace the risk-weighted capital ratio since they are simpler and may not be influenced by the ever changing risk pattern of the banks. Aspal and Nazneen (2014) on the other hand, empirically examined capital adequacy in the Indian private sector banks using time series data from 2008 to 2012. The study found that capital adequacy has an important bearing on the performance of banks. It further observed that the Indian private sector banks maintained a higher level of capital requirement than prescribed by Reserve Bank of India. Finally in the study, it was also found that Indian private sector banks have excessive funds to meet their obligations and have opportunity to give more advances to the public by protecting owner's stake and this will avert any possibility of a failure.

According to CBN (2009) on the assessment of the health of the banking sector in Nigeria using CAMEL parameters indicated that no bank was rated A, rather, the rating saw some banks at B, C, D and E given their CAR. The assessment also concluded that some banks

exhibited concerns with their inability to meet the stipulated capital ratio. The study recommended that in order to maintain a healthy banking sector, the minimum CAR should be maintained and the incidence of granting credit facility to unsecured sources be discouraged.

Ganiyu (2010) while examining perspectives on the Nigerian financial safety-net using a qualitative research method observed that the Nigerian banking industry witnessed steady and large scale deterioration in capital positions until 1998 when a large number of banks were closed. The study concluded that some banks were established with inadequate capital and failed to increase the capital base to meet the growth in their risk assets portfolio. It also concluded that soundness of banks rests with the board and management.

Meanwhile, Adeyemi (2011) in his study "bank distress in Nigeria, a consequence of capital inadequacy, lack of transparency and non-performing loans" employed both primary and secondary data and Chi-square method of hypotheses testing. He identified capital inadequacy, lack of transparency and huge non-performing loans as major causes of bank failure in Nigeria. These factors were examined and the extent to which they have been accountable for bank failure in Nigeria were determined. It was observed that these three variables combined dealt a serious blow to the banking sector in Nigeria thus, leading to the demise of some of these banks. It was also observed that aside these factors, there are other factors that may be accountable for bank failure in Nigeria, such as ownership structure, weak/ineffective internal control system, poor management among others. Choon *et al* (2013) investigate factors influencing failure among Malaysian commercial banks using panel data for 2003 to 2012 and multiple regression analysis. The study found that bank capital, bank size, non-performing loan ratio, gross domestic product, financial crisis and return on equity have significant effects on bank's liquid assets holdings. The study categorized the determinants into bank specific factors and

macroeconomic factors. According to the study, bank specific factors include Bank Size, Capital Adequacy, Profitability, Non-Performing Loans, while the macroeconomic factors include Gross Domestic Product, Inter-Bank Rate and Financial Crisis.

Furthermore, Wheelock and Wilson (1995) examined explain bank failure, deposit insurance regulation and efficiency using panel data, non-parametric linear programming framework and proportional hazard model to reveal that deposit insurance system membership increased the probability of failure, and that technically inefficient banks were more likely to fail than technically efficient banks. According to the study, weak capitalized banks, those holding few reserves, and those relying heavily on short-term borrowed funds ex ante, had a higher probability of failure than their more conservatively managed competitors. Furthermore, members of state deposit insurance system had a higher probability of failure than non-members, consistent with the hypothesis that insurance encourages banks to hold higher-risk portfolios than they otherwise would. The study then recommended that capital requirements of bank be strictly implemented and that financial institutions operate efficiently to forestall failure in the sector.

2.5 Non-performing Loans

Ganiyu (2010) while studying the perspectives on the Nigerian financial safety-net using qualitative analysis method revealed that a number of banks had poor credit policies and loan were granted without due regard to ability of the borrowers to repay. The study also found that several loans were granted without collateral. It therefore concluded that the above contributed to the large sum of Non-Performing Loans in the banking sector thereby making the institutions unsound. The study recommended unsecured advancing of credit be discouraged.

Rabeya (2014) examined the impact of Non-Performing Loans (NPL) on the profitability of state owned banks in Bangladesh using time series data of 47 state owned banks from

2006 to 2013 and a multiple regressions analysis. The study found that NPL as percentage of total loans of State Owned Banks was very high and they holds more than 50% of total NPLs of the banking industry and was also found to be one of the major factors influencing banks profitability and it had statistically significant negative impact for the study periods. The study also revealed that if the situation was not checked, it can plunge the entire banking sector in crisis due to a significant ratio of Credit/Default risk and Liquidity risk which will consequently lead to depositors' loss of confidence in banks and may be tempted to withdraw their deposits for fear of collapse of the banking sector.

Adeyanju (2014) studied code of ethics and professionalism; implication for bank failure in Nigeria using a well structured questionnaire and Pearson's Moment Correlation. He empirically investigated the various causes of Bank failure with particular emphasis on the need to enforce compliance by Banks with the Banking Code of Ethics and Professionalism (BCEP) in order to achieve standardized and efficient banking environment. The study discovered that factors such as insider's abuse on lending, lending to high risk borrowers, microeconomic instability, deficiency in bank regulation and supervision made significant contribution to failure of banks in Nigeria. The study also confirmed that many banks in Nigeria are not necessarily distressed due to unethical practices, but may be due to other means of mismanagement and abuse such as maintaining a high proportion of non-performing loans.

2.6 Liquidity

Natacha (2014) in studying the likely causes of Chicago bank failure in the great depression using Vector Error Correction Model (VECM) showed that banks' long-term investments in illiquid assets (especially mortgages) severely weakened their position when they came to face large withdrawals on their deposits. Though restricted to Chicago, these results reassert the role that liquidity issues played in the Great Depression, both on the liability and the asset sides of the balance sheet. More

specifically, they suggest that a solvent but ex ante less liquid bank is not necessarily healthy, and that liquidity risk management is just as important as credit risk management when the occurrence of bank runs cannot be completely excluded. In another development, Wu and Hong (2012) examined liquidity risk, market valuation, and bank failures. The study observed that systematic liquidity risk was the major predictor of bank failures in 2008 and 2009, while idiosyncratic liquidity risk played only a minimal role. To enhance the safety and soundness of the banking system, an effective liquidity risk management framework needs to target liquidity risk at both the idiosyncratic and the systematic levels.

Furthermore, Zuzana *et al* (2013) examined bank failure and excess liquidity in Russia utilized Excess Liquidity Creation Hypothesis (ELCH). The study showed that excess liquidity creation significantly increases the probability of bank failure. The study further suggested that the cost of bank failure can be reduced through an early identification of excessive liquidity creators and enhanced monitoring of their activities by financial authorities.

3.0 Methodology

Type and source of data

The study utilized secondary data in the form of time series spanning the period of forty three (43) years (1970-2013). sourced from the CBN Statistical Bulletin and the World Bank data base. As widely known, time series macroeconomic data are notably not stationary due to change in their time trend. As such, this study applies Augmented Dickey Fuller (ADF) test for stationarity to investigate unit root. This is to find out whether the series used are stationary or not.

In order to investigate the determinants of bank failure in Nigeria, this study employs Autoregressive Distributed Lag (ARDL) model as developed by Pesaran *et al* (2001). The model is a more robust econometric technique for estimating level relationship between a dependent variable and a set of independent variables that may not necessarily be integrated of the same order. ARDL model provides consistent estimation in the presence of a mixture of stationary and non-stationary series (Pesaran *et al.* 2001).

Variables measurement

The variables captured in the model for this study were measured as follows;

Dependent variable

The dependent variable used in the study as a proxy for bank failure is Financial Deepening in line with the study of Mayuku and Ohwofasa (2012). It is the ratio of money supply to GDP, and it also refers to liquid money. The more liquid money is available in an economy, the more opportunities exist for continued growth and a robust banking sector. It can also play an important role in reducing risk and vulnerability of the financial sector of the economy (Okoli 2009).

Independent variables: The study used six independent variables which are defined as below:

i. **Inflation**: Consumer Price Index (CPI) was used as a proxy for inflation in line with the study of Mayuku and Ohwofasa (2012).

ii. **Real Exchange rate**: This was measured by $\frac{nominal\ exchange\ rate \times domestic\ price}{foreign\ price}$ in line with the work of Chete (2001).

iii. **Real Interest rate**: This was measured by nominal interest rate minus inflation. That is, $\frac{(i-p)}{(1+p)}$ where, i stands for nominal lending rate and p stands for inflation similar with the work of Chete (2001)

iv. **Capital adequacy**: It was measured by Capital Adequacy Ratio (CAR) which evaluates the amount of a bank's core capital expressed as a percentage of its risk weighted asset It can be measured as $\frac{\text{Tier 1 capital} + \text{Tier 2 capital}}{\text{Risk weighted asstes}}$, where; Tier 1 capital is the core capital that includes equity, Tier 2 capital is the supplementary capital that include undisclosed reserves, revaluation reserves and hybrid instruments while Risk weighted assets are the loans in line with the study of Khalafalla (2013).

v. **Non-performing loan**: This was measured as a percentage of non-performing loans to total loan portfolio in line with Khalafalla (2013).

vi. **Liquidity**: This was measured by liquidity ratio in line with the study of Aremu (2011).

Autoregressive Distributed Lag Bound Testing Approach

The ARDL approach to co-integration analysis involves estimation of Unrestricted Error Correction Model (UECM). Hence the ARDL model for testing the relationship between bank failure and its determinants is stated as thus:

$$\Delta FDEP_t = \beta_0 + \sum_{t-1}^{m} \beta_1 \Delta FDEP_{t-1} + \sum_{t-1}^{m} \beta_2 \Delta INFL_{t-1} + \sum_{t-1}^{m} \beta_3 \Delta EXCH_{t-1} + \sum_{t-1}^{m} \beta_4 \Delta INTR_{t-1} + \sum_{t-1}^{m}$$

$$\beta_5 \Delta CAR_{t-1} + \sum_{t-1}^{m} \beta_6 \Delta NPL_{t-1} + \sum_{t-1}^{m} \beta_7 \Delta LIQ_{t-1} + a_1 FDEP_{t-1} + a_2 INFL_{t-1} + a_3 EXCH_{t-1} + a_4 INTR_{t-1} + a_5 CAR_{t-1} + a_6 NPL_{t-1} + a_7 LIQ_{t-1} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots$$

(3.1)

Where *m* is the optimum lag length which will be determine using Akaike Information Criteria (AIC) and Schwartz Information Criteria (SIC), Δ is difference operator, a_0 in each

equation represent the constant parameter of that equation, a_1 to a_5 also in each equation represent the coefficients of level lagged value of the explanatory variables captured in the model, while β_1 to β_7 are vectors of the coefficient of the first difference lagged values of the variables captured in the model.

Model specification

The basic model for this study is specified in equation (6) below. The model is a modification of Mayuku and Ohwofasa (2012).

$$FDEP_{t-1} = \beta_0+\beta_1INF_{t-1}+\beta_2EXC_{t-1}+\beta_3INT_{t-1}+\beta_4CAR_{t-1}+\beta_5NPL_{t-1}+\beta_6LIQR_{t-1}+\mu_{t-1} \ldots\ldots\ldots\ldots\ldots\ldots(3.2)$$

Where:

FDEP $\quad$ = Dependent variable

β_0 $\quad$ = Constant parameter

β_1-β_6 $\quad$ = Coefficient of independent variables

$FDEP_{t-1}$ $\quad$ = Lag value of financial deepening

$INFL_{t-1}$ $\quad$ = Lag value of inflation

EXC_{t-1} $\quad$ = Lag value of real exchange rate

INT_{t-1} $\quad$ = Lag value of real interest rate

CAR_{t-1} $\quad$ = Lag value of capital adequacy ratio

NPL_{t-1} $\quad$ = Lag value of non-performing loan

$LIQR_{t-1}$ $\quad$ = Lag value of Liquidity Ratio.

t $\quad$ = Lag value of other determinants of bank failure

μ $\quad$ = Error term

4.0 Results and Discussion

This section presents the results of the data so anlysed, it comprises of four components. The first is the result of unit roots test followed by bound test result and then integration result. The fourth and final is the discussion of results, which is further decomposed to discuss long run and short run relationships separately.

Unit Root Test

As a pre-condition for applying the ARDL/bound testing approach to cointegration and to ensure that none of the series is beyond integrated of order one i.e. I(1) testing for unit root became inevitable in this study. Giving the outcome of the unit root test, the above condition has been satisfied. For instance, the Augmented Dickey Fuller (ADF) and Philip Perron (PP) unit root test approaches applied show that at first difference, the financial deepening (FDEP) which is the dependent variable and a proxy for bank failure is stationary. This is because in absolute term, its actual value is greater than its critical values, which implies that the null hypothesis which says the series is not stationary is rejected for FDEP. Furthermore, though the results of ADF and PP was I(1) for the explanatory variables show that some of them were not integrated at the same order. For instance, inflation, interest rate and liquidity were integrated at level 1(0).

However, it shows that the other remaining explanatory variables were stationary at first difference. This is an indication that the null hypotheses which state that the explanatory variables are not stationary are thereby rejected. In summary, the unit root test has indicated that our dependent variable (i.e. FDEP) and the explanatory variables are stationary at I(1) and 1(0). This implies that none of the series is I(2). This is represented in table 4.1

Table 4.1: Unit Root Tests Results

Variables	ADF		PP	
	At Level	**At First diff.**	**At Level**	**At First diff.**
FDEP	-2.642188	-5.256084**	-2.592462	-6.355583**
INFL	-3.752617**		-3.407608**	
EXCH	-1.774217	-4.193486**	-1.740482	-6.200720**
INT	-5.638308**		-7.079029**	
CAR	-1.817725	-5.929817**	-1.929059	-6.814179**
NPL	-0.596616	-5.239999**	-0.594643	-8.398863**
LIQ	-3.623756**		-4.254109**	

Significant at 1% and 5%. (Values in parentheses are probability values)

Source: Author's computation

Bound Test for Cointegration Analysis

Bound Test for Cointegration among the variables captured in the model is required after Unit root test and Lag selection have been carried out. The Bound Test result shows that there exists a cointegration among the variables as the F-Statistics value of 4.0205 percent is greater than the critical value of upper bound of 3.9369 at 5% level of significance. This reveals that the null hypothesis which states that there is no cointegration among the variables is hereby rejected. The above analysis is represented in table 4.4

Table 4.2 Bound Test result

Asymptotic Critical Value for Rejecting Null Hypothesis		
Critical Value	At 5%	At 10%
Lower Bound	2.6872	2.1607
Upper Bound	3.9369	3.2744

F-Statistics 4.0205**. Significant at 5%

Source: Author's computation

From Table 4.2, it can be said that there is a strong cointegration among the captured variables. This is owing to the fact that at 5% level of significance, the F-statistics of 4.0205 is greater than the upper bound critical value of 3.9369.

Regression Results

Table 4.3: Result of Estimated Long-run coefficients (Dependent variable: FDEP)

Independent Variables	Coefficient	Std error	t-statistics	Prob.
INFL	0.83844	1.8750	0.44717	0.162
EXCH	-0.99545	2.1564	-0.46162	0.058
INTR	2.9083	5.6401	0.51564	0.000
CAR	13.0453	24.6629	0.52894	0.024
NPL	-0.097227	1.3016	0.074696	0.071
LIQ	0.11472	0.81874	0.14011	0.089
R-Squared	0.83817			
Adjusted R-Squared	0.80009			

Source: Author's computation

Having established the existence of cointegration among the variables, the long run relationship between bank failure (FDEP) and the explanatory variables has also been estimated using the ARDL approach with ARDL (1,0,0,0) specification selected based on

Akaike Information Criterion as represented in table 4.3 above. The result indicates that there exist positive long run relationships between bank failure and inflation but this relationship is not significant giving the probability value of 0.162, meaning that the null hypothesis which states that there is no long run relationship between bank failure and inflation cannot be rejected. In the same vein, the result indicates a negative and significant relationship between bank failure and exchange rate giving the p-value of 0.058, meaning that the null hypothesis which states that there is no long run relationship between bank failure and exchange rate is hereby rejected, contrary to the findings of Mayuku and Ohwofasa (2012). It can also be seen from the above table that a positive and significant long run relationship exists between the dependent variable (financial deepening) and, Capital Adequacy Ratio, interest rate and liquidity. From the table, it can be seen that the null hypothesis of no long run relationship is rejected giving their respective p-values of 0.024, 0.000 and 0.089. On the other hand, the result reveals a negative long run relationship between bank failure and Non-Performing Loans (NPL). This negative long run relationship is significant giving the p-value of 0.071. The table also shows the value of R-Squared which is the multiple coefficient of determination as well as the goodness of fit of the model. It indicates the extent to which changes in bank failure is explained by variation in the explanatory variables. From the table, the R-Squared stood at 0.83817 indicating that approximately, 84% of the variation in bank failure is explained by the joint influence of the explanatory variables. And only 16% variation is explained by other variables not captured in the model.

Table 4.4: Result of Estimated short-run coefficients (Dependent variable: FDEP)

Independent Variables	Coefficient	Std error	t-statistics	Prob.

ΔINFL	0.044783	0.031307	1.4304	0.161
ΔEXCH	0.02487	0.038591	0.64466	0.042
ΔINTR	0.15534	0.030547	5.0852	0.010
ΔCAR	0.69678	0.17661	3.9453	0.034
ΔNPL	-0.14385	0.077113	1.8655	0.070
ΔLIQ	0.0061272	0.039511	0.15508	0.071
R-Squared	0.69256			
Adjusted R- Squared	0.62022			

Source: Author's computation

Table 4.4 presents the estimated results of the short run relationship between bank failure and the explanatory variables. It can be seen from the result that in the short run, inflation which stood as 0.044783 is positively correlated to bank failure. But this relationship is insignificant giving their p-values of 0.161 which means that the null hypothesis which states that there is no short run relationship between bank failure inflation cannot be rejected. On the other hand, the result shows a positive and significant relationship between bank failure and exchange rate giving the p-value of 0.042. In the same dimension, the result also shows a positive and significant short run relationship between bank failure and liquidity ratio. Furthermore, the result reveals a positive and significant short run relationship between bank failure and capital adequacy ratio giving the coefficients of 0.69678. The p-value of 0.034 indicates the rejection of the null hypotheses which states that there is no short run relationship between them. It can also be seen that the R-Squared result stood at 0.69256. This implies that in the short run, 70% of the variation in bank failure is explained by the joint influence of the explanatory variables. The 30% of the variation is explained by other variables not included in the model.

4.5 Discussion of results

This study has empirically investigated the determinants of bank failure in Nigeria from 1970-2013. Giving the outcome of our unit root test which shows a mixture of integration order [i.e. I(0) and I(1)] among the variables captured in the model, bound testing approach to cointegration with an autoregressive distributed lagged model became necessary in the estimation procedure, as it is the only approach that is capable of providing consistent estimation when variables are integrated of different orders. The discussion of results will be in three folds; first, would be the long run relationship between bank failure and the explanatory variables. Second would be the short run relationship and lastly, we would look at the direction of flow among the variables.

a. Long run relationship between bank failure and the explanatory variables

To begin with, the ARDL bound testing approach confirmed the existence of cointegration between the explained variable (financial deepening) which is a proxy for bank failure and the explanatory variables. This is in line with the study of Ogude *et al* (2012). The ARDL estimated results shows crystal clear that there exist positive and significant long run relationship between bank failure and most of the explanatory variables. For instance, in the long run, inflation, interest rate, capital adequacy ratio and liquidity ratio have positive impact on bank failure. But in the case of inflation, the relationship cannot be said to be significant giving the probability value of 0.162. This means that an increase in any of the aforementioned variables except inflation leads to a robust and viral financial sector thereby forestalling the occurrence of a failure in the financial sector. This is consistent with the findings of Mayuku and Ohwofasa (2012) and Demirguc-Kunt and Detragiache (1998).

Furthermore, it can also be deduced from the result that there exist negative and significant long run relationships between financial deepening and, exchange rate and Non-Performing Loans (NPL). It reveals that the rate of depreciation of the naira is adversarial to banking sector soundness. This is in line with the findings of Chete (2001) but contrary to the findings of Ogude *et al* (2012) and Mayuku and Ohwofasa (2012). More so, the negative

long run relationship between financial deepening and NPL shows that a negative change in NPL depletes financial deepening which invariable makes the financial sector more vulnerable to shocks thereby leading to bank failure in line with the findings of Adeyemi (2011).

b. Short run relationship between bank failure and the explanatory variables

From the estimated results of the ARDL bound testing model, there exist a positive but insignificant short relationship between bank failure and inflation. However, the result shows a positive and significant relationship between financial deepening and exchange rate. This implies that an increase in the value of naira brings about a formidable financial sector. On interest rate and financial deepening, the result shows a positive and significant relationship giving the p-value of 0.010. This reveals the fact that the process of financial liberalization may have contributed positively to banking sector which is consistent with the study of Chete (2001). The result also reveals a positive and significant short run relationship between Capital Adequacy Ratio (CAR) and financial deepening. This is an indication that capital adequacy serves as the bedrock of the financial sector. It also implies that a unit increase in capital adequacy of banks leads to 69% increase in financial sector soundness thereby reducing cases of failure. This is consistent with the findings of Adeyemi (2011). In addition, the result shows an expected negative and significant short run relationship between Non-performing Loans (NPL) and financial deepening. Giving the p-value of 0.070, a unit decrease in the NPL leads to 14% decrease in financial sector soundness which will logically leads to the collapse of financial institutions. This is also consistent with the findings of Adeyemi (2011). On liquidity ratio, the ARDL short run coefficient shows a positive and significant relationship with financial deepening. This means that on the short run, liquidity ratio contributes positively to financial sector soundness.

5.0 Summary, Conclusion and Recommendations

Summary

This study was carried out to empirically investigate the determinants of bank failure in Nigeria with a view to contributing to the ongoing debate on the issue. In doing this, data were sourced from the statistical bulletin of the Central Bank of Nigeria (CBN) and World Bank, and were subjected to both descriptive and econometrics analyses. The result of the descriptive analysis showed that series were appropriately normal. On the other hand, the econometrics analysis which began with testing for stationarity of the variables indicated that inflation, interest rate and liquidity were stationary at level values, while financial deepening, exchange rate, capital adequacy ratio and non-performing loans were stationary at first difference. The above led to the adoption of ARDL model bound testing approach to cointegration. The results of the study are summarized as follows:

i.   There is insignificant long run and short run relationships between bank failure and inflation.

ii.   There is significant long run and short run relationships between bank failure, exchange rate, interest rate, capital adequacy ratio, non-performing loans and liquidity ratio.

iii.   There is a negative long run relationship between bank failure and exchange rate

iv.   There is a negative long run and short run relationships between bank failure and Non-performing Loans (NPL).

v.   There is a unidirectional causal relationship between bank failure, liquidity and exchange rate. Here, exchange rate and liquidity have causal effect on bank failure; while on the other hand, bank failure has no causal effect on exchange rate and liquidity.

vi.   There is a bidirectional causal relationship between bank failure and, capital adequacy ratio and non-performing loans (NPL). This means that all of these variables have causal effect on bank failure and vice versa.

vii. There is no causal relationship between bank failure and, inflation, and interest rate, meaning that there is no causal effect between bank failure, inflation, and interest rate vice versa.

Conclusion

From the above findings, it can therefore be concluded that inflation is not part of the major determinants of bank failure in Nigeria. Rather, the cause of bank failure is mainly determined by

Capital Adequacy Ratio (CAR), exchange rate, liquidity and Non-performing Loans (NPL) based on their relationships and causality. Furthermore, giving the negative relationship as well as the causality between bank failure and non-performing loans, it can be concluded that Non-Performing Loans (NPL) leads to the degradation of the financial sector thereby making the financial institutions vulnerable to failure. Following the same logic, the negative long run relationship between bank failure and exchange rate reveals that a decrease in the value of the country's currency has negative effect on the soundness of the financial sector. This can, in the long run, bring about the disappearance of some financial institutions. In addition, giving the non-causal relationship between interest rate and bank failure, it can be concluded that interest rate has no effect on bank failure in Nigeria.

Recommendations

It is very clear from the above that Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), exchange rate, and liquidity ratio are the major determinants of bank failure in Nigeria. In trying to make any recommendation however, one must first recognize the fact that in Nigeria government at several times since the 1990s banking crisis has been taking bold step to curtail further recurrence. Some of the bold steps taken include the bank consolidation exercise and the establishment of Asset Management Company of Nigeria (AMCON), as well as the routine inspections of banks (on-site and off-site) being done by the monetary authorities. Never the less giving the findings of this study, it will

not be out of place to suggest for intensification of the current measures that are already in place.

Furthermore, giving the negative role of Non-performing Loans (NPL) in the viability and sustainability of the financial institutions, it can be recommended that high NPL in banks be discouraged. In addition, financial institutions should make sure that all necessary checks prior to the advancement of credit such as adequate collateral and viable financial projects be dully carried out and satisfied. This will ensure that only credit worthy customers are recommended for loans, thereby reducing the incidence of loan default in banks. Insider dealings and favouritism in loan approvals should also be avoided. In addition, the decrease in the value of the nation's currency which played a negative role in the soundness of the financial system as revealed by this study should be watched, so that, a favourable and stable exchange rate is maintained. The liquidity ratio as important as it is should be closely monitored so that banks do not fall into the problem of illiquidity.

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