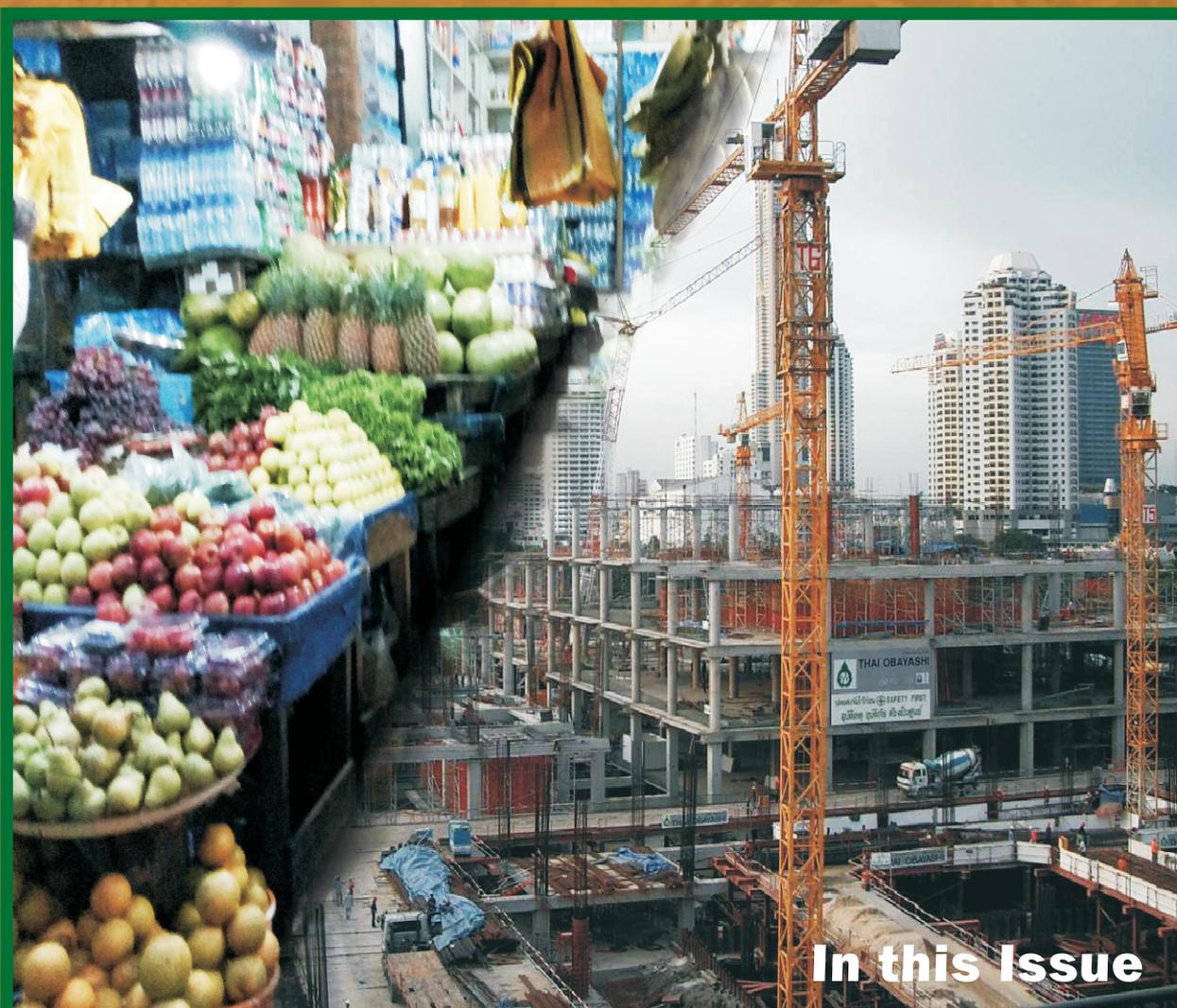


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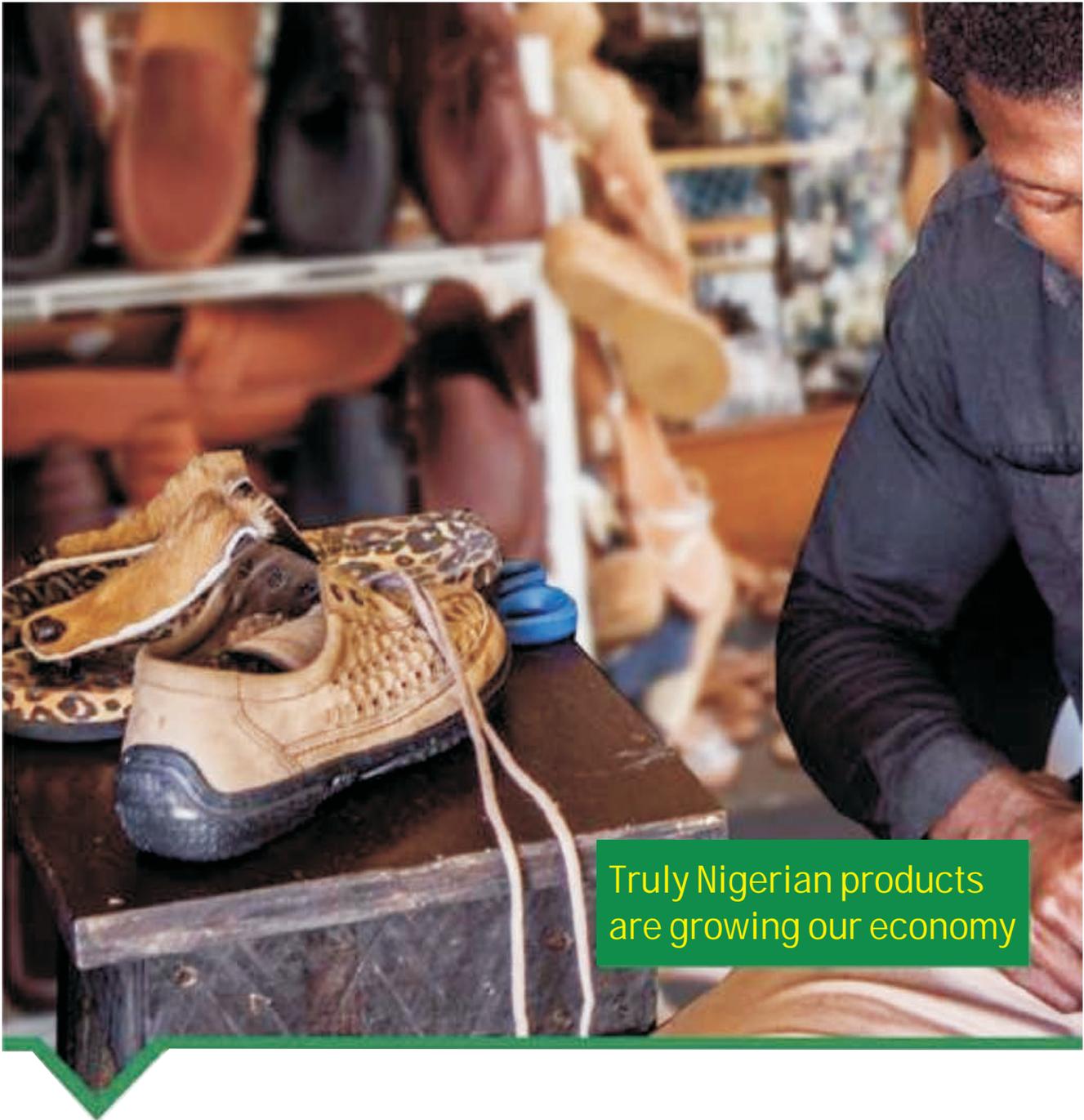
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A STUDY ON THE IMPACT OF MONETARY POLICIES ON NIGERIAN PROPERTY MARKET



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well as international oil price. Secondary data from the Central Bank of Nigeria (CBN) statistical bulletin were analysed using the multivariate regression model. The findings showed that in the long term monetary policy rate has significant impact on loan advanced to the real estate sector. It was recommended that with the importance of the real estate sector in an economy, the CBN should engage property professionals in gathering reliable property market data to be considered in the formulation of monetary policies.

Keywords: Property market, Real estate loans, Monetary policy rate,

Abstract

The authority responsible for formulating monetary policies in Nigeria has focused more on the oil and gas sector while other sectors such as the property sector have not been given their deserved attention with regards to monetary policies formulation. Hence, this study examined the impact of monetary policy rate on the Nigerian property market. It was revealed that the key economic indicators that are relevant to the real estate sector include interest rate (monetary policy instrument), GDP (gross domestic product), exchange rate (monetary policy instrument), inflation rate as

1.0 Introduction

Over the years, the Nigerian economy has undergone various level of restructuring to ensure, functionality, better governance, economic strength, and solutions to its many challenges while enabling better harnessing of opportunities. These have had impact on almost every sector of her economy, including the real estate sector. However, as with all the economies of the world, the fundamental objective of every nation is how to achieve economic growth and development (Shuaib, Ekeria & Ogedengbe, 2015). Such aspirations in the property sector cannot be overemphasized because of its major role in the lives of the people.

In order to achieve this fundamental objective, various policies and programmes are pursued which sometimes bring along with them shocks and disturbances both internally and externally.

After Nigeria's independence, development planning had a broad scope, encompassing government policies introduced to achieve national economic objectives, such as accelerated growth and higher levels of average material welfare (Metz, 1991). Of greatest importance to the Nigerian economy as would be to any other economy are the fiscal, and monetary policies (Ajisafe and Folorunso, 2002; Eze&Ogiji, 2013).

In the opinion of Johnson (2015) monetary and fiscal policies are closely related, but Ajisafe and Folorunso, 2002; Adejo and Mobolaji, 2010; Eze and Ogiji, 2013, were of the view that both are distinct and have different profound effects on the economies of nations where they have been used so far. According to Kamm and Chivunga (2010), government fiscal and monetary policies will have a critical impact on the future of sectors such as housing (real estate) , which has been a recipient of public investment.

In reality, government macro-economic policies require a mixture of both fiscal and monetary policy instruments to stabilize an economy because none of both can cure all the problems in an economy without the other (Shuaib et al., 2015).

For instance, a combination of good economic management strategies supported by good public policy initiatives have resulted in the growth of the real estate sector of Dubai's economy over the years (Falade-Obalade and Dubey, 2014). They further stated that it has led to the real estate sector contributing about 22.5% of the GDP of United Arab Emirates, which happens to be the biggest of such contributions from a single source. Whereas Nigeria's real estate sector contribution to GDP is about 7.5% (National Bureau of Statistics, 2015). Hence, the impact of macro-economic policies on the real estate sector cannot be overemphasized.

Fiscal policy deals with macroeconomic levers of power which include budgets, debts, deficit and state spending (Johnson, 2015). Fiscal policy is one of the major economic stabilization weapons that involves measures taken to regulate and control the volume, cost and availability as well as direction of money in an economy to achieve some specified macroeconomic policy objective and/or to counteract undesirable trends in the Nigerian economy (Shuaib et al., 2015). These policy instruments cannot be left to the market forces of demand and supply to decide. Hence government has to intervene through them. The weapons or instruments of fiscal policy include increase (or decrease) in aggregate desired expenditure, tax policy, as well as budgetary policy.

On the other hand, monetary policy, the main focus of this paper, is the process by which monetary authority of a country, generally the Central Bank, controls the supply of money in the economy through the regulations of interest rates, (lending and foreign exchange rates etc.) in order to maintain price stability and achieve high economic growth (www.wikipedia.org). By fixing interest rates, the central bank indirectly equally controls access to credit and inflation rates in the economy.

Monetary policies are effective only when economies are characterized by well developed money and financial markets like developed economies of the world (Abata, Kehinde and Bolarinwa, 2012). This is where a deliberate change in monetary variable influences the movement of many other variables other sectors of the economy, including the property sector.

While monetary policies itself cannot provide infrastructure, it can boost local production (and enhance development of properties) by increasing availability of long-term credit to the real sector (including the real estate sector) and by lowering interest rates (Ononugbo, 2012).

In order to show the relationship between residential properties and monetary policies, Xu and Chen (2011) argued that house price booms are usually preceded by periods of easing monetary policies. However, if not properly managed, the boom may eventually become a

burst.

In view of the foregoing, taken together, fiscal and monetary policies create an investment environment (Johnson, 2015). That is, investment environment for every sector of the economy including the health, manufacturing, oil and gas, education, as well as the real estate sector etc.

The real estate market, also known as the property market can be described as a set of submarkets where property rights are traded (Dugeri, 2011). The trading may be in form of sales, purchase or lease for monetary returns. Unlike other forms of formal markets that have specific dealing locations, the property market has no central dealing location. Nevertheless, property markets are identified according to their geographical character.

According to Nguyen (2015), the four main factors that influence the property market are demographics, interest rates, the health of an economy and government policies. "Understanding the key factors that drive real estate market is essential to performing a comprehensive evaluation of a potential investment" Nguyen (2015). Hence, the fiscal and monetary policies (government policies) of a nation both play vital roles in determining the "health" or performance of the country's property market. Thus, the effects of government policies in the form of monetary policy rate (MPR) on the performance of Nigeria's real estate sector present a problem for investigation.

As a result of its great investment potentials and globalization, the Nigerian property market has attracted some foreign direct investments but its potentials are still far from being harnessed. Hence, Babawale (2008) is of the view that the Nigerian property market though with great potentials like similar markets in several emerging economies in Africa, has not benefitted from internationalized property investment and remains poorly researched.

Without adequate research and with increasing inability to forecast or measure the performance of the real estate market, property investment will remain unattractive to investors, especially

the foreign investors. Dugeri (2011) is however of the view that although the market is adjudged immature, it still exhibits potentials to emerge from its current status. However, he argued further that it must be given the needed fillip through a well articulated mix of land use and property taxation policies. As well as through monetary policy instruments, such as interest (bank lending) rate and foreign exchange rates. It is assumed that the higher the interest rate, the less favourable terms you will get for loans from banks.

For the property market, the required evaluation and empirical analyses of the performance of the sector can be carried out with data and indices that are available from monetary policies of the national government on the sector. For instance "property market observers/stakeholders in Asia look forward to policy makers and experts for clues about how the market will perform" (Holt, 2015). This may however be necessary, if one considers that part of the problems of the housing bubbles that resulted into the recent global recession was actually caused by ineffective management of fiscal and monetary policies on residential property market in the United States of America.

However, in Nigeria, due to dearth of research and analyses on these economic indices that drive the property market, the proper assessment of the market by various stakeholders especially investors will be challenging. Similarly, government will find it difficult to know the impact of its policies on the sector.

It is against this backdrop that this paper has arisen to study the impact of Central Bank of Nigeria's monetary policy rate on Nigerian real estate sector from 2010 to 2016. The study purpose will be achieved by (i) identifying the monetary policies that have been in operation in Nigeria during the study period, (ii) investigating the extent such policies have been focused on / directed at the real estate sector, and (iii) to examine the effects of the policies on the real estate market.

2.0 Nigerian Real Estate Sector

Nigerian real estate sector has been greatly influenced by laws, policies as well as institutions in which it is meant to thrive overtime. Land ownership right, right of way over land, leasing rights which usually come with limits all through to mortgage rights on property; all have one form of influence or the other on the usage and benefits accruable from a real estate investment.

In 1978, the military government sought to unify the various administrative laws that existed in different parts of Nigeria by promulgating the Land Use Decree which later became the Land Use Act after it was enshrined in the Constitution. This Act remains the chief land administration law in Nigeria till the present moment and it is difficult to amend because it has been enshrined in the Constitution.

The Act makes land administration by government to be easier as well as the acquisition of land for public purposes. Nevertheless, the Land Use Act has its own challenges which need to be addressed.

For instance, there is still a clear divide as to the ease by which property is registered in Nigeria, which is important in measuring the ease of doing business. According to the Nigerian Bureau of Statistics Report (2015), northern states of Gombe, Borno, Zamfara, Kano and Jigawa are the top five easiest to register property in Nigeria, while the southern states of Rivers, Osun, Ogun, Ondo and Oyo are most difficult. Furthermore, the Report stated that access to finance remains a constraint to real estate development in the country. Less than 1% of private sector lending from Deposit Money Banks (DMBs) is for mortgages, and other sources of longer term lending represent less than 11% banks' balance Sheet. Similarly, international investors remain reluctant to invest in the country's real estate market due to the currency risk eminent in its foreign exchange market (Okoye, 2016) amongst other push factors.

Currently, a growing number of real estate developers in Nigeria are, increasingly, jittery with the crippling impact of the economic recession that has hit the real estate market hard with low demand, over supply, falling prices resulting in

properties that have remained unsold or unoccupied for a long period (CBN, n.d.). Furthermore, developers of residential houses are worse hit than their commercial counterparts, because residential properties have a higher sensitivity to economic downturn than commercial properties. This is buttressed by the fact that the global recession of 2007/2008 was triggered by the activities in the mortgage sector of the United State of America (USA) economy.

The falling trend is same in the real estate sector across major cities of the country, including Lagos, Abuja and Port Harcourt. In Lagos for instance, demand is weak, residential property prices have come down by as much as 40 per cent, and vacancy rate has increased by 72 percent between January 2015 and June 2016 (CBN, n.d.). This is the situation especially in the high income property market of Ikoyi, Victoria Island etc.

Worthy of mentioning is the fact that Nigeria presently has a huge housing deficit of more than 17 million units, which property investors can take advantage of, and equally benefit from the huge and increasing population of the country. Mortgage rates of commercial banks currently ranges from 18% - 30% .In a bid to develop the mortgage sub-sector of the real estate sector. The Nigerian Mortgage Refinance Company (NMRC) was established (licensed on February 18, 2015) with the main objective of making affordable housing available to Nigerians. It promotes home ownership while deepening the primary and secondary mortgage sectors of the economy.

According to Rewane (2016) the key economic indicators that are relevant to the real estate sector include interest rate (monetary policy instrument), GDP (gross domestic product), exchange rate (monetary policy instrument), inflation rate as well as international oil price. These economic indicators equally determine the performance of the real estate sector. However, the major drawbacks of the sector in Nigeria include; issues of property titling, bureaucracy challenges faced by property investors, ineffective demand from consumers due to lack of capital , ignorance about mortgages, over protection of lessee by the laws, lack of

adequately developed mortgage sector, unstable foreign exchange policies amongst others. Nevertheless, in spite of the several challenges being faced by the real estate sector, it remains one of the sectors that have done quite well in Nigeria (Okoro, 2014), and one sector of the Nigerian economy with a bright future (Chagoury, 2016).

2.1 Monetary Policy Regime in Nigeria (2011-2014)

In Nigeria, the two major phases of monetary policy regime are (i) the pre-SAP (Structural Adjustment Programme) period and (ii) the period since the introduction of SAP. Before the introduction of SAP in 1986, the CBN's monetary policy framework placed emphasis on direct monetary policy control, while it relied and continue so, on indirect approach based on the use of market instruments such as the interest rates in monetary management in the second period.

Over time, the framework of formulating and implementing monetary policy in Nigeria has undergone tremendous transformation in line with the evolving financial environment. The major developments include the shift from direct control to market-based approach to monetary management, and the switch by the CBN since 2002 from short-term (one-year) to medium-term (two-years framework in the conduct of monetary policy. This is aim at freeing monetary policy from the problem of time inconsistency and minimizing over-reaction due to temporary shocks

2.1.1 MP Regime (2011)

According to the CBN (www.cbn.gov.ng) it achieved significant progress in the restoration of stability in the financial sector by the end of December 2010. Consequently, in the first half of 2011, the basis of monetary policy was the promotion of price stability in the economy. Domestic inflation remained high in the first half of 2011 due to the rise in international oil and other commodity prices, as well as the high spending necessitated by the general elections of that year. In addition, AMCON operations in stabilizing the banking sector as well as bail out to

banks during the crisis period of 2009 were equally contributory factors. The CBN reported that it employed the Monetary Policy Rate (MPR) to anchor short-term interest rates, and to rein-in inflation expectations. Open market operations (OMO) supported by reserve requirements and discount window operations remained the major instruments of monetary policy in the second half of 2011. At the end of the year, while private consumption stood at \$270.9, GDP was \$414.1 and inflation at 10.9% (Rewane, 2016).

2.1.2 MP Regime (2012)

In 2012, the monetary policy environment was characterized by continuing threat of inflationary pressures against the backdrop of decreasing trend in output growth. Other key concerns in the year were, narrowing the spread between the lending and deposit rates, sustaining a stable exchange rate for the naira, creating a buffer for the external reserves, sustaining stability in money market rates, and mitigating the impact of the continued slowdown in global economic activities on the domestic economy. In view of these multi-dimensional challenges, monetary policy during the period focused on deploying the mix of appropriate instruments to deliver on price stability. In addition, the slow pace of recovery in the advanced economies, the reduced growth momentum in the emerging economies and the prolonged financial crises in the Europe region were some of the key considerations that defined the thrust of monetary policy in the period, according to the CBN. The Bank continued with its tight monetary policy approach, which commenced in the third quarter of 2010, using the MPR as the signaling interest rate to affect money supply and rein-in inflation expectations. OMO continued to be used as the main instrument of monetary policy. According to Rewane (2016) at the end of the period, the private consumption declined to \$269.8 against that of 2011, GDP grew to \$414.1 while inflation rose to 12.24%.

2.1.3 MP Regime (2013)

The CBN reported that monetary policy in 2013 was aimed primarily at sustaining the already moderated rate of inflation which was achieved in the first half of 2013. The fall in inflation rate from

8.4% at end of June 2013 to 8.0% at end of December 2013 is evidence of the effectiveness of the CBN policy. Besides, the monetary policy also aimed at limiting pressure on the exchange rate, boosting the external reserves position, sustaining stability in the money market and reducing the spread between lending and deposit rates. The MPR was the principal instrument used to control the direction of interest rates and anchor inflation expectations in the economy. The other intervention instruments included OMO, Discount Window Operations, Cash Reserve Ratio (CRR) and foreign exchange Net Open Position (NOP). Rewane (2016) reported that private consumption increased to \$375.4, GDP increased to \$515, and inflation fell to 8.52%, at the end of the period.

2.1.4 MP Regime (2014)

The CBN reported that in 2014, its monetary policy was focused on achieving the objective of price and exchange rate stability. Hence, it sustained its tight policy stance with a view to ensuring that electioneering spending did not result into unimaginable inflationary rate. Inflation remained within single digit, and fluctuated between 7.7 and 8.5 per cent. The exchange rate experienced significant pressure especially during the second half of the year due to certain factors. The financial market was generally stable for the year under review, although, significant fluctuations were noticed towards the end of the year. Policy instruments such as the MPR, OMO, CRR, NOP were deployed to achieve price and financial system stability, with a view to boosting investor confidence and reduce concerns about declining foreign exchange reserves. The year ended with private consumption rising to \$420.2, GDP increasing to \$568.5 while inflation fell to 8.06%.

However, a successful monetary policy is a function of certain fundamental imperatives, which include relevant legal and regulatory framework, deep and broad financial market, good understanding of monetary transmission lag, availability of timely and accurate data and information for the monetary authorities.

2.2 The Effect of Monetary Policy on the Real Estate Sector

Olowofeso et al. (2012) opined that central banks often rely on movement in house price indices to monitor households borrowing capacity, their debt burden, and the effects of these on aggregate consumption, for monetary policy formulation. Furthermore, Sousa (2007) discovered that monetary policies contractions usually have a large and negative impact on housing prices which equally affect residential output. In their study, Oni, Emoh and Ijase (2012) submitted that money supply in an economy is significantly affected by the money market indicators and, by implication, the funds available to the real estate sector.

When the amount of money in circulation in an economy is much, and credit becomes cheap as a result of this, house prices tend to increase slightly as demand for houses also tends to increase. Similarly, a fiscal policy, be it reduction in tax payment or increased government spending, could affect residential property markets through increased overall demand for houses. It is against this backdrop that Taylor (2007) concluded that the housing bubbles in the United States which resulted in global economic recession were as a result of the ineffective management of the impact of fiscal and monetary policies on residential property market. It could also be the lack of awareness of such impact on real estate on the part of the national policy makers who would rather focus on other sectors of economy just as the Nigerian policy makers often focus more on the oil and gas sector.

In the Asia Pacific region, real estate analysis indicates that monetary policy, tax, regulations and underlying fundamental economic drivers such as demographics and urbanization have significant impact on property markets in the region (www.propertywire.com).

The research carried out by Xu and Chen in 2011 revealed that the Chinese government through the Chinese State Council adopted several monetary policies to control overheating home prices and also to reduce the risk of real estate bubble. The Chinese economy has been gradually transformed from a state-planning economy to a market-oriented economy over the last three

decades. However, unlike the Nigerian economy, in China, commercial banks are still primarily state owned or state holding which make monetary policy to play a pivotal role in controlling the supply of credit to the real estate sector. In similar vein, the Central Bank of Nigeria controls the privately owned commercial banks in Nigeria through its various rules and regulations. It may be appropriate to mention that China has fast emerged as another economic world power.

In Singapore, the major focus of monetary policy is to control inflation (Parrado, 2004). It is a forward looking policy rule that reacts to both inflation and output volatility. The country unlike Nigeria and South Africa (Verryne, 2012) uses its currency rather than interest rates, as a monetary policy tool to maintain a steady appreciation of its currency against major currencies including the US dollar. Consequently, promotion of price stability in every sector of the economy, including the property market, has been the basis for sustainable economic growth in Singapore.

The predictability of a property market through analysis of government policies and available property market data are essential for the decision making process of stakeholders in the property industry. As it may be possible to rightly analyse, evaluate, predict or forecast the property markets of matured markets such as the United States, Singapore, United Kingdom and Hong Kong (Dugeri, 2011), such may not be said of Nigerian property market.

In view of this, Waylort (n.d.) argued that there is considerable need for an econometric model of the property market which must include instrumental variables such as the fiscal policy instruments, federal housing program instruments, as well a monetary policy instruments. Furthermore, he argued that until such a model is constructed, generalizations about the relationship between these policy instruments and the behaviour of the property market can at best be termed "speculative". If not, according to Lime, McGreal & Webb (2006), "investors perception about the market will remain hinged on myths rather than empirical evidence".

3.0 Study Methodology

The manipulation of the quantity of money in the economy is the most influential instrument for monetary policy implementation (Chuku, 2009) and as earlier mentioned the major monetary instrument for controlling money supply and inflation in an economy is the interest rate otherwise known as monetary policy rate (MPR). MPR is the interest rate at which banks can borrow from the central bank, while the central bank equally influences the rate at which the banks can lend to companies and their customers. Consequently, due to the importance of MPR in controlling the quantity of funds in an economy and by extension funds that would be available for real estate investment (Oni et al., 2012), this study has focused on the impact of MPR as a monetary policy instrument on loans advanced by commercial banks to the real estate / construction sector during the period under review (2010–2016).

The real estate / construction loans (REL) were the dependent variable while the monetary policy rate (MPR) was the independent variable. Hence, we specified the following model:

$$REL_t = \psi_0 + \psi_1 MPR_t + \psi_2 PLR_t + \psi_3 DDGRT_t + \psi_4 EXCH_t + \mu_t$$

(3.1) The variable definitions and apriori expectations is presented in Table 3.1 below;

Table 3.1: Variable Definitions

Code	Variable	Measurement	Parameters	Apriori Expectation	Source
REL_t	Real estate /construction loans at time t	Deposit Money Banks' Sectoral Allocation of Credit	Dependent variable		CBN 4 th Qtr 2016 bulletin
MPR_t	Monetary policy rate at time t	CBN Lending rate to commercial banks	ψ_1	Negative	CBN 4 th Qtr 2016 bulletin
PLR_t	Prime lending rate T time t	Commercial banks lending rate to borrowers	ψ_2	Negative	CBN 4 th Qtr 2016 bulletin
$DDGRT_t$	Demand deposit growth rate at time t	Changes in demand deposits on monthly basis	ψ_3	Positive	CBN 4 th Qtr 2016 bulletin
$EXCH_t$	Exchange rate at time t	Official exchange rate of naira to 1 US dollars	ψ_4	Negative	CBN 4 th Qtr 2016 bulletin

Several studies on similar subject have used vector auto regressions (VARs) to examine the impact of monetary policy shocks on housing prices (Kuttner & Shim, 2012), but this study have utilized the multivariate regression model to analyse secondary data obtained mainly from the Central Bank of Nigeria (CBN) fourth quarter 2016 Statistical Bulletin.

Study hypothesis: CBN's monetary policy rate has no significant impact on loan advanced to the real estate / construction sector.

4.0 Data Analysis and Discussions

4.1 Trend Analysis

It is imperative that a trend analysis be conducted on monetary policy variables and the real estate / construction loans growth rate. The monetary policy variables examined are monetary policy rate (MPR), prime lending rate (PLR) and demand deposit growth rate (DDGRT) between the periods of January 2010 – December 2016 for the Nigerian economy. Figure 4.1 below shows the trend analysis of such variables.

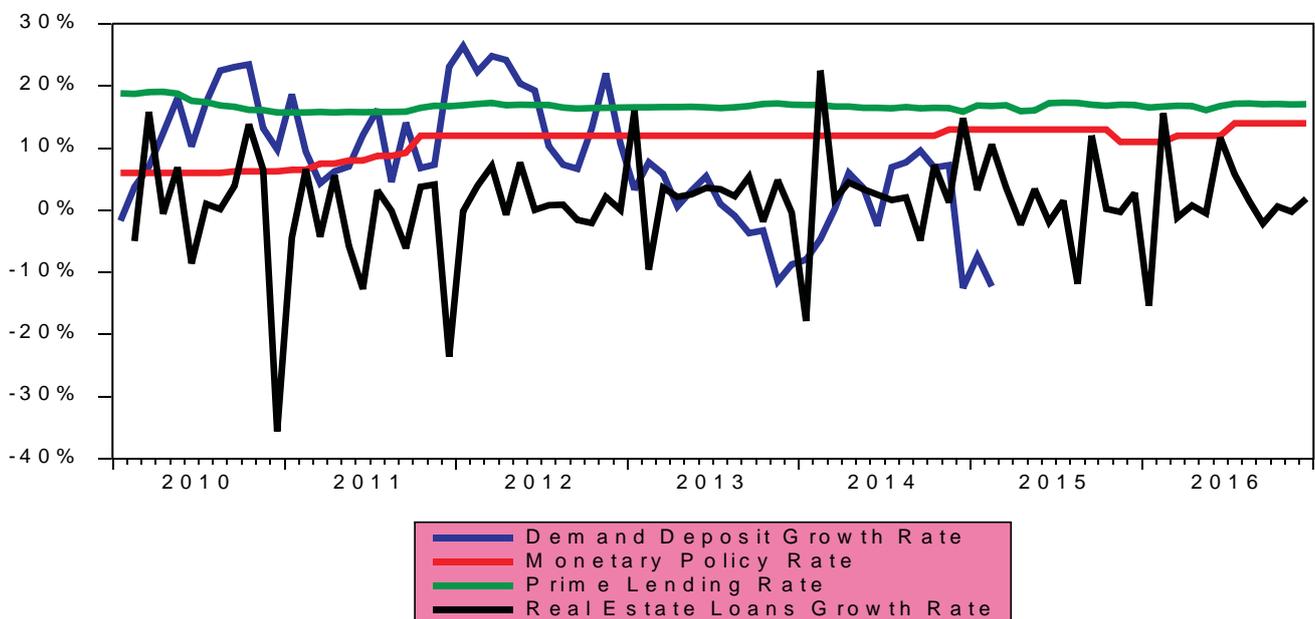


Figure 4.1: Monetary Policy Variables

Source: CBN 2016 4th Quarter Statistical Bulletin

Figure 4.1 above reveals that the monetary policy rate has relatively remained stable for the period under study with little deviations as real estate loans growth rate fluctuated around it. However, prime lending rate remained above the monetary policy rate throughout the period which is

expected, and the graph reveals that shocks that have been experienced in real estate and construction loans growth rate has not been triggered by shocks in prime lending rate. Put differently, prime lending rate has not triggered a shock in the real estate loans growth rate, a further confirmation of this using the impulse-response function was examined.

4.2 Descriptive Statistics

Table 4.1: Descriptive Statistics of the Variables

	Demand Deposit Growth Rate (%)	Exchange Rate (%)	Monetary Policy Rate (%)	Prime Lending Rate (%)	Real Estate & Construction Loans
Mean	8.010488	176.9943	10.94940	16.76889	842.0 billions
Median	7.131449	160.6772	12.00000	16.73669	771.0 billions
Maximum	26.45883	309.7304	14.00000	19.05416	1,420.0 billions
Minimum	-12.54730	150.0753	6.000000	15.72663	453.0 billions
Std. Dev.	9.914184	39.56637	2.525109	0.697833	284.0 billions
Skewness	-0.073920	2.384257	-1.053542	1.338024	0.582472
Kurtosis	2.453384	7.986249	2.641317	5.900602	2.080063
Jarque-Bera	0.828334	166.6049	15.98958	54.51154	7.711820
Probability	0.660891	0.000000	0.000337	0.000000	0.021154
Observations	62	84	84	84	84

Source: CBN 2016 4th Quarter Statistical Bulletin

Table 4.1 clearly shows the average of the variables used and the normality condition of each variable.

The result of the probability clearly shows that Demand Deposit Growth Rate is normally distributed as the null hypothesis of normal distribution is not rejected given that the probability is greater than 5% while the probability of real estate and construction loans growth rate, monetary policy rate, prime lending rate and exchange rate are less than 5%. The decision is based on the null hypothesis of normality distribution and the alternative

hypothesis, hence null hypothesis is accepted for probability values greater than 5%.

Consequently, the null hypothesis: "CBN's monetary policy rate has no significant impact on loan advanced to the real estate / construction sector", is rejected.

4.3 Correlation Test

A correlation test using Pearson Product Moment Correlation is conducted to examine the degree of relationship associated with monetary policy tools and real estate and construction loans. The result of the test is presented in Table 4.2.

Table 4.2: Correlation Test Result

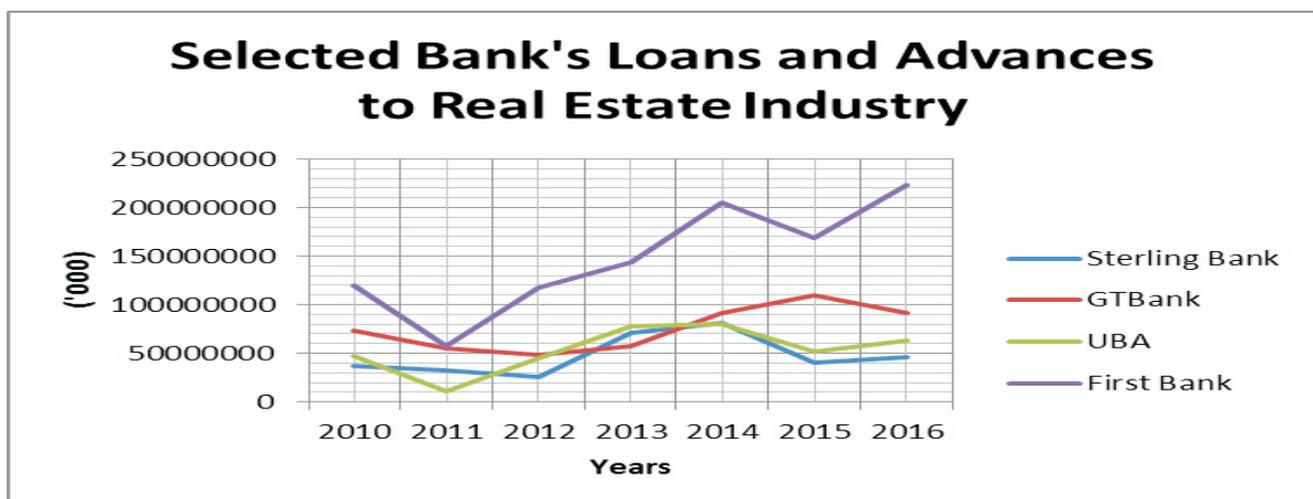
	Demand deposit growth rate	Exchange rate	Monetary Policy Rate	Prime Lending Rate	Real Estate and Construction Loans
Demand deposit growth rate	1.0000	-0.4983	-0.3272	0.0001	-0.3661
Exchange rate		1.0000	0.6817	-0.1902	0.3480
Monetary Policy Rate			1.0000	-0.2213	-0.2430
Prime Lending Rate				1.0000	0.1585
Real Estate and Construction Loans					1.0000

Source: CBN 2016 4th Quarter Statistical Bulletin

It can be seen that from Table 4.2, there is a weak relationship between real estate and construction loans and advances given by deposit banks and the monetary policy rate, although the negative relationship expected was true. Also, there is a weak positive relationship between real estate and construction loans and advances given by deposit banks and exchange rate, prime lending rate but negative with demand deposit growth rate.

In this section, we carefully examined selected bank's contribution of loans and advances given to the real estate/construction sector. The banks are UBA (United Bank for Africa), First Bank, GT Bank (Guarantee Trust Bank) and Sterling Bank for the period 2010 to 2016.

4.4 Selected Bank's Loans and Advances Given to the Real Estate & Construction Industry



Source: CBN 2016 4th Quarter Statistical Bulletin

Figure 4.2: Selected Bank's Loans and Advances to Real Estate/Construction Industry

From Figure 4.2, it can be seen that First bank gave out the highest volume of loans to the real

estate/construction sector for the whole period, while Sterling Bank gave out the least. Also, GT Bank gave out considerably minimum out of the total. A further confirmation of this is presented in Figure 4.3 below.

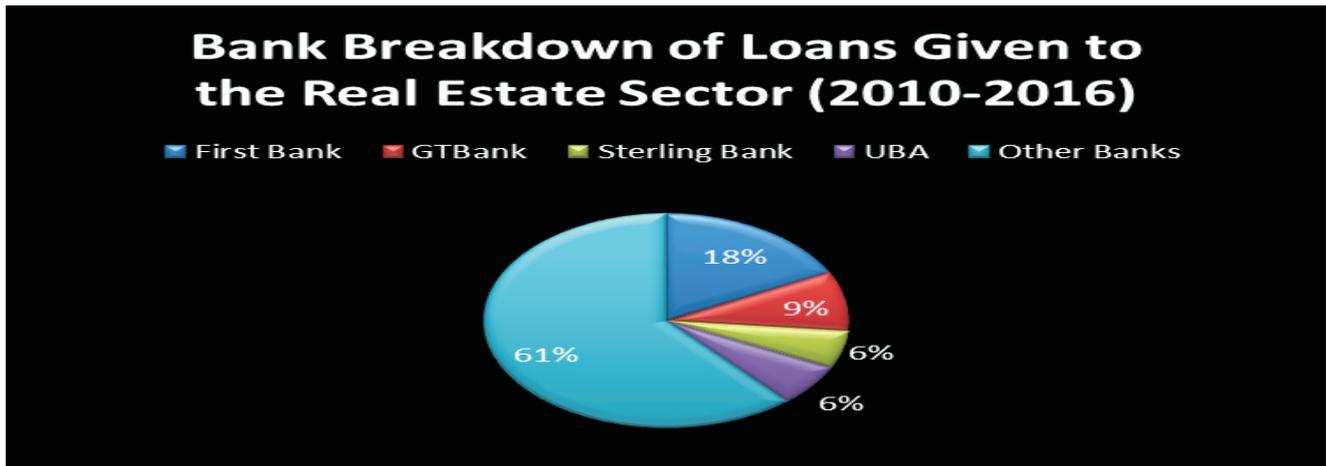


Figure 4.3: Bank Breakdown of Loans Given to the Real Estate Sector (2010-2016)

Table 4.3: Descriptive Statistics of Selected Bank's Loans and Advances to Real Estate / Construction Sector

	First Bank	GTBank	Sterling Bank	UBA
Mean	148 billions	75.5 billions	47.7 billions	53.6 billions
Median	144 billions	73.8 billions	40.2 billions	51.7 billions
Maximum	223 billions	110 billions	81.2 billions	79.8 billions
Minimum	57.8 billions	48.7 billions	25.6 billions	10.6 billions
Jarque-Bera	0.266614	0.607815	0.879939	0.500667
Probability	0.875196	0.737929	0.644056	0.778541
Sum (NGN)	1,040 billions	529 billions	334 billions	375 billions

Source: Bank's Respective Annual Report

4.5 Unit Root Test

The study deploys Augmented Dickey-Fuller (ADF) test to examine the stationarity of the time series and test the null hypothesis of unit root. It is expected that the series do not contain unit root in order to find relationship among the variables in the long run. The test is carried out at levels, and first difference using 5% Mackinnon Critical value. The variables of demand deposit growth rate, real estate and construction loans growth rate, monetary policy rate, prime lending rate and exchange rate were tested. The levels of statistics of the tests are reported in Table 4.4 below. ADF

reported all the variables except prime lending rate not stationary at the level. Thereafter, test was carried out on the series at first differences as also presented in Table 4.4. At 1%, and 5% Mackinnon Critical value, ADF test reported all the variables except prime lending rate which is already stationary at levels stationary at this first difference. This finding implies that the series contains no unit root at level and the difference level; hence, their seasonal variation has been corrected for, making them fit for regression. These are illustrated in the table below.

Table 4.4 Unit root test

Variable	Method	ADF at level	ADF at I(0) critical value (5%)	ADF at I(1)	ADF at I(1) critical value (5%)	Order of integration
DDGRT	ADF	-2.264633 (0.1866)	-2.910019	-8.776118 (0.0000)	-2.910860	I(1)
EXCH	ADF	1.352097 (0.9987)	-2.897678	-6.333606 (0.0000)	-2.897678	I(1)
MPR	ADF	1.580182 (0.4882)	-2.896779	-8.668213 (0.0000)	-2.897223	I(1)
PLR	ADF	-3.270957 (0.0195)	-2.896779			I(0)
LOG(REL)	ADF	-0.577625 (0.8690)	-2.896779	-10.73268 (0.0001)	-2.897223	I(1)

Source: CBN 2016 4th Quarter Statistical Bulletin

Given that the variables are not all stationary at first difference, Pesaran, Shin & Smith (2001) proposed that for such order of integrated series, ARDL (Autoregressive Distributed Lag Model) be run in order to make provision for such integration series. To achieve this, a lag length

selection criterion was conducted on the series.

4.6 Lag Length Selection Criteria

Before the ARDL bound test for co-integration is conducted, it is imperative to test for the optimal lag length criteria for each variable. The Akaike information criterion is used.

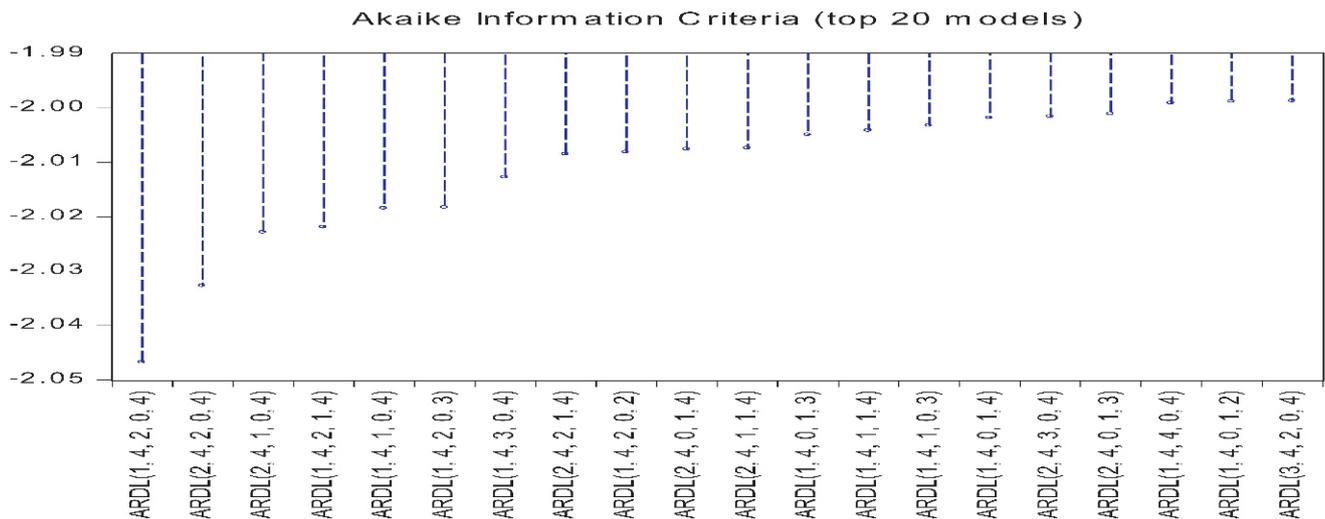


Fig 4.4: Akaike Information Criterion lag length structure of the ARDL model

The best fitted ARDL model is selected based on the least Akaike information value. From Figure 4.4, it is revealed that the optimal lag length is to the order of ARDL (1, 4, 2, 0, 4).

4.7 Co-integration Test

Here, the ARDL bound test co-integration is used and the result is presented in Table 4.5.

Table 4.5: ARDL Bound Co-Integration Test

Level of significance	Lower Bound I(0)	Upper Bound I(1)
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Estimated Model: $\log REL_t = f(MPR_t, PLR_t, EXCH_t, DDGRT_t)$

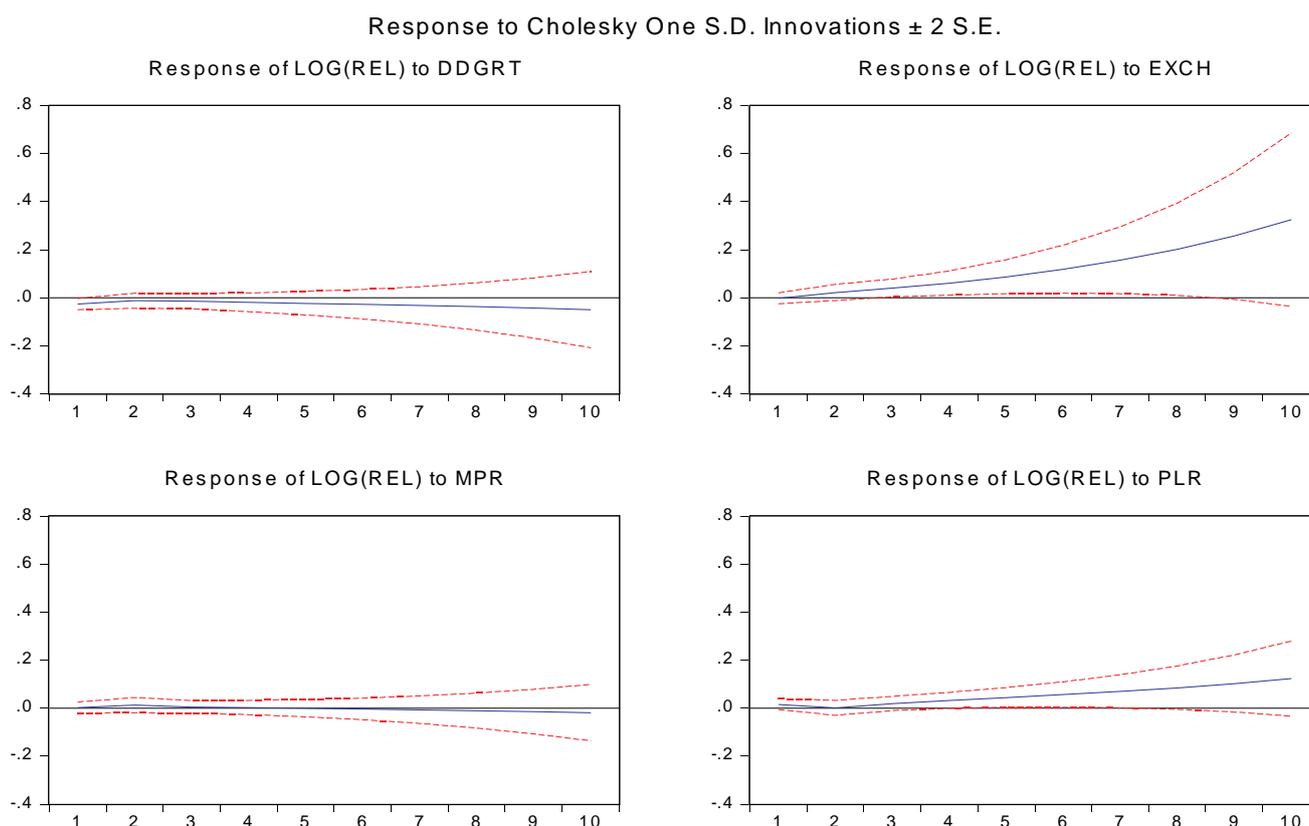
Optimal Lags: (1, 4, 2, 0, 4)

F-Statistics: 4.310935***

Table 4.5 shows that the F-statistics is greater than the 5% lower and upper bound test and we can therefore conclude that there is co-

integration; hence the variables are co-integrated in the long run.

4.8 Impulse - Response Function



Source: CBN 2016 4th Quarter Statistical Bulletin

Fig 4.5: Impulse Response Function for Real Estate / Construction Loans and Monetary Policy Rate

Impulse response functions show the response of variables to one standard-deviation shock in itself and in other variables in the model over a particular time period. According to Alege (2010), impulse response functions trace out how the endogenous variables of the model respond to shocks which the economy undergoes within a given period. Simply put, it traces out how the change in one variable impacts other endogenous variables. In this study, we shall be making use of Cholesky one standard-deviation innovation over a time period of ten years. This study also considered both the use of multiple graphs to see how the variables respond individually. The multiple graphs also show the upper and lower boundary using positive and negative two standard errors.

From Figure 4.5, Real estate and construction loans responds negatively to demand deposit growth rate after the second year with the impact being felt most 10 years after the shock. The

response of Real estate and construction loans to a shock in demand deposit growth rate implies that demand deposit growth rate does not cause a shock in real estate and construction loans. Real estate and construction loans respond positively to exchange rate after the first year with the impact being felt most 10 years after the shock. The response of Real estate and construction loans to a shock in exchange rate implies that exchange rate causes a shock in real estate and construction loans. Real estate and construction loans did not respond to monetary policy rate after the first year even till 10 years later. The implication of this is that monetary policy rate as a monetary policy tool is not effective in determining real estate loans given by demand deposit banks. Real estate and construction loans respond positively to prime lending rate after the third year with the impact being felt most 10 years after the shock. The response of Real estate and construction loans to a shock in prime lending rate implies that prime lending rate causes a shock in real estate and construction loans, although this shock is positive, our apriori expectation could have been negative.

Table 4.6: ARDL long and short run result

Dependent Variable: log (REL)

Long run Result		Short Run Result	
Variable	Coefficient	Variable	Coefficient
MPR	-0.09** (-3.58)	$\Delta(\text{MPR})$	-0.034 (-1.11)
PLR	0.077 (0.98)	$\Delta(\text{MPR})_{t-1}$	0.126** (3.09)
EXCH	0.041** (4.16)	$\Delta(\text{MPR})_{t-2}$	0.005 (0.12)
DDGRT	-0.008 (-1.37)	$\Delta(\text{MPR})_{t-3}$	-0.089** (-2.90)
C	20.517** (9.85)	$\Delta(\text{PLR})_t$	0.098 (1.86)
		$\Delta(\text{PLR})_{t-3}$	-0.076 (-1.65)
		$\Delta(\text{EXCH})_t$	0.011** (3.93)
		$\Delta(\text{DDGRT})_t$	-0.001 (-0.55)
		$\Delta(\text{DDGRT})_{t-1}$	0.003 (1.07)
		$\Delta(\text{DDGRT})_{t-2}$	0.00005 (0.025)
		$\Delta(\text{DDGRT})_{t-3}$	0.003 (1.65)
		CointEq _{t-1}	-0.281** (-3.11)
		R-squared	0.91
		Adjusted R-Squared	0.88
		Prob (F-statistic)	0.0000
		Durbin-Watson Statistics	2.4

Source: CBN 2016 4th Quarter Statistical Bulletin

From Table 4.6, it can be seen that in the short run, there is a positive impact of prime lending rate and exchange rate on real estate loans and advances growth rate, although only exchange rate is statistically significant at 5%. The implication of this result is that prime lending rate and exchange rate are positive macroeconomic policy drivers of real estate loans and advances growth rate. Exchange rate conforms to the a priori expectation while prime lending rate does not. The possible reason for this is probably because the return on real estate investment drives the market to borrow irrespective of the prime lending rate. The long run result also shows that there is a negative impact of monetary policy rate and demand deposit growth rate on real estate loans and advances growth rate, although demand deposit growth rate is statistically insignificant at 5%. The monetary policy rate conforms to a priori expectation and it shows that monetary policy rate is a major macroeconomic policy driver of real estate loans and advances growth rate.

In the short run, last year and last three years monetary policy rate respectively has a positive and negative statistical significant impact on real estate loans and advances growth rate for the

current year. Also, current exchange rate has a positive statistical significant impact on real estate loans and advances growth rate. However, current year and last three years prime lending rate does not have a significant impact on real estate loans and advances growth rate. Also, current period till last three years demand deposit growth rate does not have a significant impact on real estate loans and advances growth rate. A major conclusion drawn from the result of this finding is that monetary policy rate and exchange rate both in the long run are major macroeconomic policy drivers and determinants of real estate loans and advances given by the demand deposit financial institutions. However, while the exchange rate is equally a major macroeconomic driver and determinant of real estate loans and advances in the short run, the monetary policy rate is not. MPR does not have strong impact on real estate / construction loans and advances in the short run because the effect of real estate is felt in a long term due to the fact that real estate is long term in nature.

5.0 Conclusion and Recommendations

The study attempts to examine the impact of monetary policies most especially the monetary

policy rate (MPR) on the Nigerian property market in order to guide the monetary authority that is the Central Bank of Nigeria (CBN) in formulating policies that take into consideration the real estate sector. It was revealed that in other economies, property experts and property investors looked forward to know how the monetary policies of the government would affect their property investment thereby taking informed decision.

It was established that two major phases of monetary policy regime existed in Nigeria viz-a-viz; the pre-SAP, and the period since the introduction of SAP. However, a major conclusion drawn from the analyses of the secondary data of the study is that in the long run, MPR is a major macroeconomic policy drivers as well as a major determinants of real estate loans and advances given by commercial banks. Hence, the analysed MPRs from 2010 to 2016 showed significant impact on the Nigerian property market with regards to the loans and advances to the sector within the same period.

Recommendations of the study are as follows;

- i. Monetary policy authority should shift focus from oil and gas sector to other real sectors of the economy such as the property sector when formulating monetary policies. Most importantly, it is believed that crude oil which is the major driver of our economy may not be relevant in about two decades as developed economies such as Britain, Germany, France etc. are planning to phase out petrol and diesel vehicles by 2030-2040.
- ii. CBN should engage property experts in gathering reliable property market data for the purpose of using same in formulating property related monetary policies for the Nigerian economy.
- iii. If the above are implemented, property investors both domestic and foreign will find it easy to analyse / predict the Nigerian property market, and would be able to make informed decision for their investment purpose.

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Appendix

Null Hypothesis: DDGRT has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=10)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.264633	0.1866
Test critical values: 1% level	-3.542097	
5% level	-2.910019	
10% level	-2.592645	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(DDGRT) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=10)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-8.776118	0.0000
Test critical values: 1% level	-3.544063	
5% level	-2.910860	
10% level	-2.593090	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: EXCH has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.352097	0.9987
Test critical values: 1% level	-3.513344	
5% level	-2.897678	
10% level	-2.586103	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: EXCH has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.352097	0.9987
Test critical values: 1% level	-3.513344	
5% level	-2.897678	
10% level	-2.586103	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(EXCH) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.333606	0.0000
Test critical values: 1% level	-3.513344	
5% level	-2.897678	
10% level	-2.586103	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: MPR has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.580182	0.4882
Test critical values: 1% level	-3.511262	
5% level	-2.896779	
10% level	-2.585626	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(MPR) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-8.668213	0.0000
Test critical values: 1% level	-3.512290	
5% level	-2.897223	
10% level	-2.585861	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: PLR has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.270957	0.0195
Test critical values: 1% level	-3.511262	
5% level	-2.896779	
10% level	-2.585626	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LOG(REL) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.577625	0.8690
Test critical values: 1% level	-3.511262	
5% level	-2.896779	
10% level	-2.585626	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LOG(REL)) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-10.73268	0.0001
Test critical values: 1% level	-3.512290	
5% level	-2.897223	

10% level -2.585861

*MacKinnon (1996) one-sided p-values.

ARDL Bounds Test

Date: 07/22/17 Time: 04:58

Sample: 2010M05 2015M02

Included observations: 58

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	4.310935	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

ARDL Cointegrating And Long Run Form

Dependent Variable: LOG(REL)

Selected Model: ARDL(1, 4, 2, 0, 4)

Date: 07/22/17 Time: 04:57

Sample: 2010M01 2016M12

Included observations: 58

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MPR)	-0.033778	0.030456	-1.109092	0.2737
D(MPR(-1))	0.126401	0.040802	3.097904	0.0035
D(MPR(-2))	0.004759	0.040739	0.116811	0.9076
D(MPR(-3))	-0.088518	0.030483	-2.903842	0.0059
D(PLR)	0.097562	0.052499	1.858348	0.0701
D(PLR(-1))	-0.075711	0.045880	-1.650205	0.1064
D(EXCH)	0.011432	0.002912	3.926174	0.0003
D(DDGRT)	-0.001172	0.002124	-0.551905	0.5839
D(DDGRT(-1))	0.002659	0.002485	1.069998	0.2907
D(DDGRT(-2))	0.000053	0.002505	0.021261	0.9831

D(DDGRT(-3))	0.003402	0.002059	1.652186	0.1060
CointEq(-1)	-0.280876	0.090382	-3.107647	0.0034

$$\text{Cointeq} = \text{LOG}(\text{REL}) - (-0.0852 * \text{MPR} + 0.0769 * \text{PLR} + 0.0407 * \text{EXCH} - 0.0075 * \text{DDGRT} + 20.5165)$$

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MPR	-0.085155	0.023787	-3.579944	0.0009
PLR	0.076937	0.078588	0.978985	0.3332
EXCH	0.040702	0.009776	4.163692	0.0002
DDGRT	-0.007512	0.005478	-1.371321	0.1776
C	20.516525	2.083863	9.845428	0.0000

R-squared	0.913321	Mean dependent var	27.23777
Adjusted R-squared	0.882365	S.D. dependent var	0.226116
S.E. of regression	0.077553	Akaike info criterion	-2.046750
Sum squared resid	0.252610	Schwarz criterion	-1.478352
Log likelihood	75.35574	Hannan-Quinn criter.	-1.825347
F-statistic	29.50318	Durbin-Watson stat	2.486989
Prob(F-statistic)	0.000000		

Year	Month	REL	MPR	PLR	DDGRT	EXCH	REL
2010	Jan	764,834,305,288.97	6	18.82109	-1.68046	150.3325	
	Feb	726,763,125,927.46	6	18.73828	3.759225	150.9721	-4.97768
	March	841,747,610,660.29	6	19.02869	6.99663	150.0753	15.82153
	April	836,812,987,295.23	6	19.05416	12.44314	150.3768	-0.58628
	May	894,153,000,946.53	6	18.77455	18.06519	151.4905	6.852188
	June	817,311,180,651.45	6	17.64674	10.28385	151.2776	-8.59383
	July	825,301,684,438.82	6	17.40244	17.40958	150.2686	0.977718
	August	826,643,585,478.94	6	16.8915	22.49466	150.6973	0.162607
	Sept	858,892,878,994.65	6.25	16.65631	23.07462	152.6215	3.901196
	Oct	977,702,687,276.15	6.25	16.1646	23.50949	151.784	13.83292
	Nov	1,041,408,257,962.99	6.25	16.11156	13.21301	150.5475	6.515987
	Dec	670,304,810,900.29	6.25	15.73752	9.75812	152.6295	-35.6349
2011	Jan	640,558,386,168.25	6.5	15.72663	18.66919	152.4745	-4.43783
	Feb	682,733,645,511.68	6.5	15.74951	9.424271	152.8574	6.584259
	March	653,741,644,174.84	7.5	15.813	4.329568	155.2126	-4.24646
	April	690,358,192,247.94	7.5	15.75441	6.257313	154.5967	5.600986
	May	650,632,069,029.25	8	15.81154	7.02325	156.1741	-5.75441
	June	567,880,685,360.87	8	15.76377	12.08556	155.6545	-12.7186
	July	586,042,365,279.64	8.75	15.83559	16.26296	152.4062	3.198029
	August	585,457,546,701.30	8.75	15.82	4.562055	153.7881	-0.09965
	Sept	549,591,676,879.42	9.25	15.87	14.06797	156.7045	-6.12614

	Oct	570,205,722,514.82	12	16.48867	6.791138	159.8195	3.750782
	Nov	593,591,279,613.04	12	16.82381	7.346399	158.8285	4.101149
	Dec	453,503,633,805.10	12	16.75337	23.11154	162.172	-23.5999
2012	Jan	452,873,392,293.70	12	16.92	26.45883	161.3095	-0.13914
	Feb	470,486,012,290.27	12	17.11	22.32668	158.586	3.88917
	March	503,956,382,366.24	12	17.27	24.80979	157.7164	7.11392
	April	500,071,049,467.00	12	16.9	24.17955	157.4421	-0.7709
	May	538,447,792,880.77	12	16.98	20.39751	158.4619	7.67431
	June	538,768,700,144.26	12	16.93	19.26617	162.3295	0.059616
	July	543,167,473,576.47	12	16.96	10.33445	161.3282	0.816305
	August	547,922,836,073.93	12	16.53	7.34737	158.969	0.875605
	Sept	539,305,758,846.51	12	16.37	6.648193	157.7815	-1.57267
	Oct	528,202,711,018.05	12	16.48	13.19063	157.243	-2.05876
	Nov	539,344,928,837.28	12	16.51	22.02933	157.5768	2.109416
	Dec	539,759,763,461.46	12	16.54	10.73636	157.3253	0.076945
2013	Jan	626,456,240,000.00	12	16.57	3.31151	156.9595	16.06195
	Feb	566,337,160,000.00	12	16.56	7.712338	157.523	-9.59668
	March	586,938,760,000.00	12	16.61	5.840436	158.379	3.637763
	April	599,450,730,000.00	12	16.65	0.596311	158.2038	2.131738
	May	614,670,450,000.00	12	16.66	3.15956	158.019	2.538823
	June	636,716,300,000.00	12	16.56	5.455853	160.02	3.58664

	July	658,200,088,192.33	12	16.47	1.014061	161.1248	3.374189
	August	673,137,385,886.51	12	16.55	-0.88686	161.154	2.269371
	Sept	709,380,503,957.40	12	16.76	-3.70109	161.96	5.384342
	Oct	696,413,100,000.00	12	17.1	-3.30437	159.8335	-1.82807
	Nov	730,059,100,000.00	12	17.17	-11.5076	158.7867	4.831329
	Dec	726,921,600,000.00	12	17.01	-8.71938	159.0505	-0.42969
2014	Jan	597,265,840,000.00	12	16.9469	-8.00091	160.2295	-17.8363
	Feb	731,505,390,000.00	12	16.93014	-4.68113	163.6225	22.47558
	March	744,263,790,000.00	12	16.68679	0.151672	164.6214	1.744212
	April	777,385,320,000.00	12	16.70335	5.993717	162.1915	4.450168
	May	803,627,260,000.00	12	16.50237	3.610671	161.8585	3.375676
	June	823,789,500,000.00	12	16.49648	-2.46391	162.8195	2.509
	July	837,436,300,000.00	12	16.43768	6.907947	162.2462	1.65649
	August	854,664,240,000.00	12	16.5996	7.722741	161.9886	2.057232
	Sept	813,161,550,000.00	12	16.44041	9.609492	162.9323	-4.85594
	Oct	872,150,970,000.00	12	16.48317	6.880188	164.6425	7.254274
	Nov	883,290,930,000.00	13	16.47055	7.239648	171.101	1.277302
	Dec	1,014,166,360,000.00	13	15.88324	-12.5473	180.3286	14.8172
2015	Jan	1,047,303,250,557.00	13	16.86	-7.44414	181.7835	3.266711
	Feb	1,158,390,632,370.33	13	16.76641	-12.2824	194.48	10.60728
	March	1,200,843,867,081.64	13	16.90075		197.0727	3.664569
	April		13	15.9514		197	-2.3292

	May	1,212,822,094,938.73	13	16.07611		197	3.406175
	June	1,189,511,060,384.27	13	17.23675		196.9159	-1.92197
	July	1,207,382,057,409.21	13	17.30445		196.9737	1.502299
	August	1,064,233,816,624.00	13	17.28951		197	-11.8563
	Sept	1,191,954,286,592.14	13	17.01808		196.9975	12.00117
	Oct	1,194,141,375,461.65	13	16.83604		196.9886	0.183733
	Nov	1,190,895,861,947.36	11	16.98295		196.9914	-0.27132
	Dec	1,223,945,179,412.91	11	16.95892		196.9865	2.775212
2016	Jan	1,035,442,146,524.77	11	16.54		197	-15.4018
	Feb	1,197,270,017,844.13	11	16.72		197	15.6291
	March	1,182,969,146,826.31	12	16.82		197	-1.19438
	April	1,191,758,014,165.26	12	16.77311		197	0.743045
	May	1,185,755,328,645.31	12	16.12891		197	-0.50346
	June	1,324,112,399,489.97	12	16.78427		231.7614	11.66762
	July	1,400,613,120,661.45	14	17.13678		294.5722	5.777466
	August	1,422,266,074,243.98	14	17.17659		309.7304	1.546469
	Sept	1,391,639,531,862.37	14	17.08732		305.225	-2.1536
	Oct	1,400,297,218,098.35	14	17.1		305.2125	0.622287
	Nov	1,397,019,748,322.12	14	17.06		305.1818	-0.23424
	Dec	1,422,567,057,486.18	14	17.09		305.2237	1.828893

Addressing Infrastructure Gap via public-private partnership in Nigeria



DR. Chiedu NDUBISI

1.0 INTRODUCTION

The fact that Nigeria lacks the minimum level of infrastructure required to meeting the demands of global competitiveness in the 21st-Century is no longer new. The fact that infrastructural inadequacy has severely constrained productivity, economic growth, and global competitiveness is so glaring for all to see. The Global Competitiveness Report for 2017-2018 by the World Economic Forum ranked Nigeria 125 out of a total of 137 countries with a score of 3.3 on a scale of 1 to 7 (Where '1' implies extremely underdeveloped and '7' implies extensive and efficient by international standards). According to the WEF report, "... Nigeria's macroeconomic conditions are worsening (122nd, down 14), inflation (131st) is high at 15.7 percent, its budget deficit (99th) has reached 4.4 percent, and institutions appear more fragile (125th, down seven), adding uncertainty to the business environment." The

country's national infrastructure stock is merely 30% to 40% or less of its GDP and this does not compare favourably with emerging economies, like South Africa and Brazil, which have achieved infrastructure stock levels in excess of 70% of GDP. Inadequate Supply of infrastructure was mentioned as the most problematic factor for doing business in Nigeria. Indeed, Nigeria's diminished competitiveness is directly attributable to the abysmal level of infrastructure development in the country.

1.1 This paper is arranged in nine Sections. It commenced by examining the issue of the nature of infrastructure and the implication for financing. It also looked at the catalytic role of infrastructure on economic growth and development, including the debilitating implication of its negligence by policy makers. Next, the paper attempted at establishing a nexus between infrastructure and economic growth and development.

The paper went further to determine the magnitude and structure of Nigeria's infrastructure gap and the implication on economic growth, and , development. Thereafter, the inadequacy of the implication on economic growth, and , development. Thereafter, the inadequacy of the traditional budgetary funding of infrastructure development, and the ways to quickly close the infrastructure gap, using alternative methods of financing, was examined. Last, the paper presented how the public-private partnership (PPP) option could be used in filling the infrastructure gap, by delving into the policy, legal, regulatory, and institutional frameworks for using PPPs.

Dr Chiedu Ndubisi is a Nigerian professional with a distinguished record of achievement in infrastructure management, financing, and reform with particular emphasis on NiPost. Since 2013, he has been serving as faculty member at the Centre for Infrastructure, Policy, Regulation and Advancement, CIPRA, at the Lagos Business School. He recently retired as the Technical Adviser/Director, Planning & Research at the Nigerian Infrastructure Concession Regulatory Commission where he was responsible for the development of policy documents in support of the Federal Government's Transformation Agenda, alternative funding arrangements for major capital projects in Nigeria and the Technical Working Group Report on Critical Infrastructure in Nigeria. He was alternate at the FGN Economic Management Team from 2010 to 2013. As a World Bank Adviser at the Bureau of Public Enterprises, Abuja (Jan 2005 To Sept 2009), Dr. Ndubisi was project manager for Postal Communications. In this position, he was responsible for developing the Postal Sector Policy, establishing the legal and regulatory framework (Postal Reform Bill), forming the Postal Sector Regulatory Commission, and laying the ground for the liberalization of the Nigerian Postal Sector. Dr Ndubisi earned a PhD in Public Policy and Administration from the Walden University, a certificate in Strategic Negotiation from the Harvard Business School, an MBA in Management from Enugu State University of Technology and a B.Sc. in Economics from the University of Jos.

2.0 FACTS ABOUT NIGERIA

Nigeria has maintained a growth rate of between 6% and 8% GDP growth in real terms since 2011. According to Goldman Sachs projections, Nigeria has the potential to be the 20th largest economy by 2025 on the basis of its GDP growth; 21st on per capita income (2025); and 12th largest economy, if Nigeria maintains its growth trajectory to 2050, overtaking Korea, Italy and Canada on GDP.

The country's financial institutions are well capitalised and the country's sovereign wealth fund managed by the Nigeria Sovereign Investment Authority (NSIA), currently has about \$1.25 billion with a huge appetite for infrastructure coinvestment.

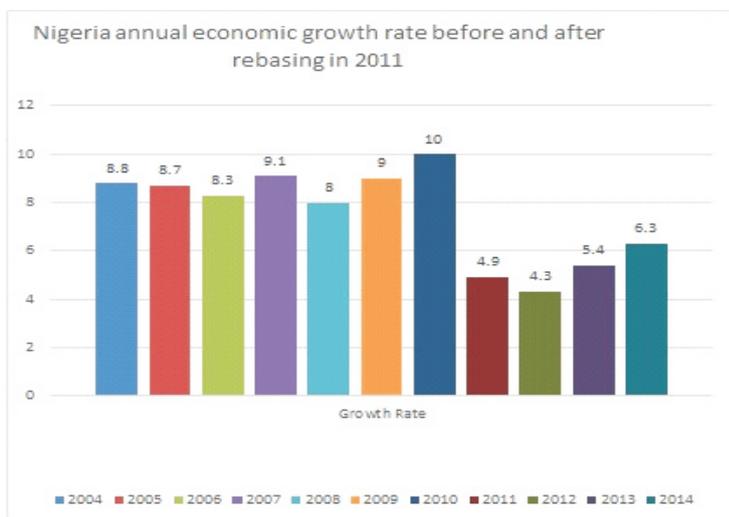
The net assets value (NAV) of the Pension Fund assets in Nigeria, based on unaudited reports, was N6.16 trillion (about US\$ 17.11 billion) as at

December 31, 2016. Only a paltry N1.02 billion or 2.83 million of the funds is available for infrastructure coinvestments. Clearly, this amount is insignificant when compared with the whopping infrastructure deficit of over \$10 billion per annum.

Sadly, Nigeria has not been able to translate resources into efficient essential services such as electricity, water, roads, railways, ports, communications, etc., that are required to quickly address several critical infrastructure challenges, diversify the economy (Boston Consulting Group, 2016).

3.0 INFRASTRUCTURE-DEVELOPMENT NEXUS: THEORETICAL INVESTIGATION

According to the Mayor of Bogota, "A developed country is not a place where the poor have cars. It's where the rich use public transportation". This insightful and remarkable quote,



Sources: World Bank/IMF



Figure 2: Gross Domestic Product (GDP) for Selected Countries

Source: Adapted from World Bank Performance Indicators, 2014

perhaps, best illustrates the relationship between infrastructure and development. This unique relationship was further stressed by Chairman Mao, who remarked that “If you want to grow rich build a road. The World Bank estimated that poor infrastructure across Africa reduces economic growth by 2 per cent annum. Infrastructure's contribution to GDP in Emerging Economies is between 11 to 16 per cent but between, 1 to 3% in Nigeria .

Evidence exists that the absence of robust infrastructure often hampers the efficiency and effectiveness of economic activities that enhances growth, wealth and job creation, and overall national development. The World Bank has indeed described Infrastructure stock inadequacy as the vital missing link with respect to achieving the Sustainable Development Goals, SDGs .

3.1 Economic Impact of Infrastructure

Infrastructure affects economic diversification, competitiveness, growth, and development through reductions in transaction costs, international competitiveness, domestic market development, economic diversification and structural changes; and improvements in welfare and quality of life of the citizens ;. These can be explained as follows:

Cost reduction: Infrastructure development contributes to the growth of the economy through its effects on production, investment and employment. Productive activities in the real sector utilize infrastructure such as electricity, telecommunications, water, and transport services as intermediate input. A 1988 survey of manufacturing establishments in Nigeria reports that infrastructure accounts for about 9 per cent of variable costs, with half of this share going to electric power . According to the Manufacturers Association of Nigeria (MAN), the cost of power and electricity input alone ranges from 44 per cent to 70 per cent of variable cost in Nigeria (Kessides, 1993).

Global Competitiveness: Globalisation has transformed the traditional organization of production and marketing to the management of

logistics, leading to cost savings in inventory and working capital, and permitting rapid response to changing consumer demands. The result has been intensified competition in finance, trade and investment. The net effect of the drastic reduction in transportation costs, lower the cost of doing business, increased global competitiveness, increased profitability, incomes, employment and the cost, service and quality of international trade (Kessides, 1993). Nigeria is currently ranked 125 of 137 countries in global competitiveness with the uncompetitive state of public infrastructure.

Domestic Market Development: Empirical studies in developing countries indicate that rural (farm-to-market) roads have a major effect in improving marketing opportunities and reducing transaction costs. The marketing of agricultural commodities, excluding the stages of processing, often accounts for 25-60 per cent of final prices for foodstuffs in developing countries, of which about a half are marketing costs, attributable to transport alone (Kessides, 1993). In Nigeria, for instance, 30-40 per cent of the market price of agricultural produce, particularly food crops, consists mainly of transport costs and other incidental services (Kessides, 1993). Farm-to-market costs on the rural road network are three times as high as what they could be with satisfactory road rehabilitation and subsequent maintenance.

Economic Diversification and Structural Changes: Infrastructure generates economic diversification through technological innovation and changes in the structure of production and consumption. As with industry, infrastructure has a direct effect on production costs and profitability of agriculture, as well as creates significant structural changes on the rural economy. Improved rural roads in Thailand, for instance, with attendant reduction in transport cost, was found to shift local demand away from some cheap locally-produced goods to imported substitutes as costs of competing manufactured consumer goods were reduced. The improved roads were found to contribute more non-farm jobs than were lost. Infrastructure provides the key to modern technology in practically all sectors. While the railroad and

electric power brought significant changes in markets and production in the past, these are insignificant compared to recent advances in informatics, digital technology, telecommunications and the growth of the internet.

These technologies underlie a very large share of production/distribution activities in secondary and tertiary sectors of the modern economy, including commerce, banking, government, and culture and tourism (Kessides, 1993) Batten & Karlsson, 2012).

3.2 The Malaysian Experience

Malaysia is made up of two main landmasses (Peninsular Malaysia and East Malaysia), with its capital in Kuala Lumpur. Figure 3 shows the

country's main road, the North-South Expressway, transverses the entire length of the Peninsula for about 800km (500 miles) long and passing through seven of the country's 13 states.

The construction of this North-South road through PPP arrangement, following the financial crises, literally transformed the entire economy of Malaysia.

Before the development of the road, the traffic situation in Peninsula Malaysia was similar to what currently obtains in Nigeria.

Following the development of the road, 200 residential areas, 44 new townships, 20 industrial parks, and 9 business centres sprang up along the corridors.



Figure 3: Expressway Routes in Malaysia

Source: https://en.wikipedia.org/wiki/Malaysian_Expressway_System

3.3 The Senegalese PPP Experience

Nearer home in Senegal, the African Development Bank (AfDB) financed four major infrastructure projects with EUR 185million directly, and facilitating EUR 1.3 billion additional investments through the PPP model. These projects are Expansion of the Dakar container

terminal; Sendou power plant; Dakar-Diamniadio toll highway; and New Blaise Diagne International Airport. Figure 4 is a pictorial depiction of the four projects. The synergistic and catalytic effect of these four projects on the economy of Senegal is better depicted by Figure 5 below.



Figure 4: Senegal PPP Infrastructure Development

Source: <https://www.afdb.org/en/projects-and-operations/selected-projects>

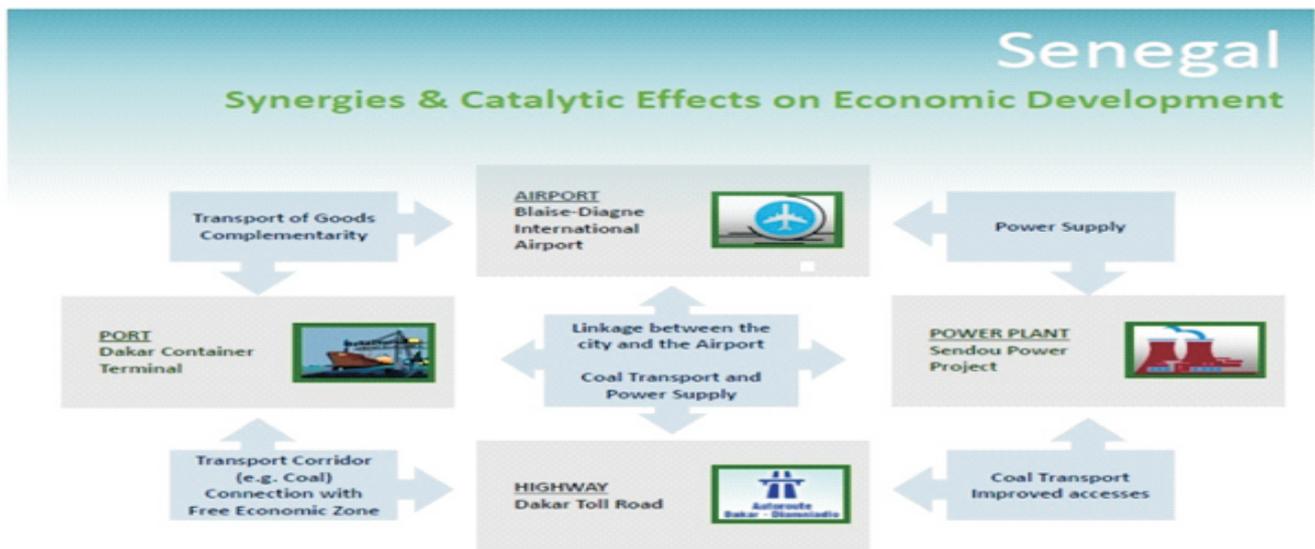


Figure 5: Senegal PPP Infrastructure Development

Source: <https://www.afdb.org/en/projects-and-operations/selected-projects>

4.0 NIGERIA INFRASTRUCTURE GAP and COMPETITIVENESS

According to the NIIMP document, the International Benchmark for core infrastructure is about 70% of GDP. By 2012, Nigeria infrastructures spend was between 20 - 25 per cent of GDP (USD 461 billion), and compares unfavourable with those of other emerging economies, such as Brazil (47%), India (47%), China (47%), South Africa (47%), Indonesia (47%),

and Poland (47%) in the same year .

The infrastructure spend comprise public and private investment of about \$10bn with ICT (28%), transport (23%), energy (19%), and others (30%). Figure 5 below illustrates the result of this expenditure pattern over the years.

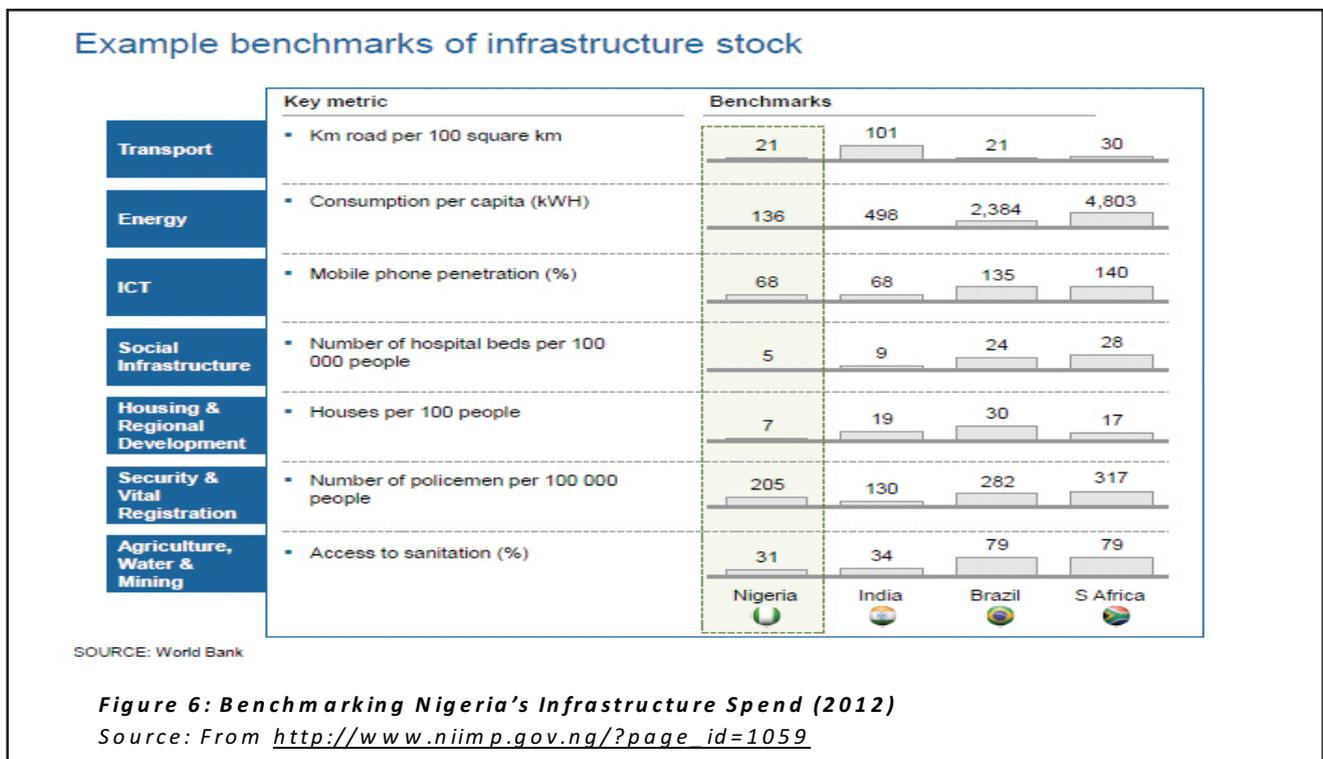
For instance, whereas Nigeria's power consumption per capita was 138 kWh (enough to power a light bulb), those of India, Brazil and

South Africa were 498 kWh, 2,384 kWh, 4803 kWh respectively. In the same vein, whereas India, Brazil and South Africa have 19, 30, and 17 houses per 100 people respectively, Nigeria has only 7 km.

The result of the above infrastructure expenditure pattern over the years is evident in the state of energy, transport, agriculture and water resources, social infrastructure and security sectors today. No airport in Nigeria is certified by the International Civil Aviation Organization (ICAO). The country's port facilities have fared better due to the concession of the ports and inflow of private capital. Months after the concession of the Apapa-Lagos container

terminal, delays for berthing space dwindled, and shipping lines reduced congestion surcharge from \$525 to \$75, saving the Nigerian economy an estimated \$200 million a year. However, it is now common knowledge in the maritime industry that Nigeria's existing seaports, especially the Lagos ports system is overstretched.

With capacity for 60mn metric tons of cargo handling, the ports run at 100mn metric tons with the renewed delays in cargo handling and processing. Furthermore, the multiplicity of ports with shallow berthing draughts outside the Lagos port complex, requiring constant unsustainable dredging costs, together with additional transshipment cost significantly



reduces the viability of most of the ports currently in the Niger Delta region.

The Nigerian Rail transport system, which consists of 3'6' narrow-gauge single track lanes, extending from South-West to North-East and from South-East to North-West and the newly build standard gauge lines, has nearly remained underdeveloped and out-modelled. We also have many abandoned rail projects and poor connectivity with our ports with respect to the rail system. The country has a 25 year Railway Master plan to connect the entire country. This plan has

remained on the shelf, due to paucity of resources.

Based on a 30-year National Integrated Infrastructure Masterplan (NIIMP), Nigeria requires an expenditure of US\$ 3.10 trillion in 30 years to launch the economy on an accelerated growth path.

A significant proportion of the planned investment of US\$ 3.10 trillion or about 48 per cent is expected from the private sector by way of

public private partnership (PPP) arrangements. The expenditure requirement for the first five years of the plan comprises energy (US\$13bn), transport (US\$11bn), Agriculture. (US\$3.2bn) and ICT (US\$3.7bn). Others are housing (US\$1.4bn), social information (US\$2.1bn) and vital registration and security (US\$ 0.6bn).

5.0 INFRASTRUCTURE DEVELOPMENT VIA PUBLIC-PRIVATE PARTNERSHIP (PPP)

A Public-Private Partnership is a contractual agreement between a public agency (federal, state or local) and a private sector entity.

Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the service and/or facility (Nat. Council on PPP USA). The goal is to combine the best capabilities of the public and private sectors for mutual benefit.

The PPP procurement methods have some distinct advantages. First, there is evidence of better quality in design and construction than under the traditional procurement method. It focuses on the whole life cost of the project, comprising the capital and maintenance costs throughout the life of a project. Thus, repairs and maintenance are planned at the outset and, in consequence, assets and services are maintained at a pre-determined standard over the full length of the concession.

PPP also uses private finance, expertise, and innovation, leading to international best practices and value-added. Besides, the PPP process makes it difficult to avoid taxes and requires a full analysis of projects risks at the outset.

Moreover, PPPs create efficient and productive working relationships between the public and private sector and, under PPP, helps the public sector develop a more disciplined and commercial approach to infrastructure development. As the private sector will not receive payment until the facility is available for

use, PPP structure encourages efficient completion, on budget without defects.

5.1 Public Procurement

In a market economy such as Nigeria, the provision of goods and services are either undertaken by the public (public goods) or private sectors (private goods). For private goods, the consumption is rival for the consumers and it is possible to exclude individuals who cannot pay the price from its benefit. Bread, for instance, is a private good and those who cannot afford the price cannot enjoy the benefits. For this reason, the market provides private goods, which are available only to those that paid for them (Musgrave and Musgrave, 1976).

For public goods, consumption is non-rival and non-excludable; meaning that it is impossible to exclude anybody that did not pay from enjoying the benefit or from consuming the good in question. Once it is provided to one person, it becomes available to everybody. There is no incentive for the private sector to be interested in the provision of such public goods.

The responsibility for provision of public goods falls under the ambit of the government in a market economy.

However, under certain circumstances, public goods could become price-excludable and/or congestible (Hyman, 2013). Congestible public goods, including public parks, roads, bridges, and highways, have the potential for, or possibility of, congestion.

At the point of congestion, the condition of non-rivalry is violated and the public good become price excludable. Both the private and the government can provide such goods and services.

There are other public goods, such as education and healthcare, which individuals can consume individually and both the private and the government can produced.

These goods and services are price excludable public goods.

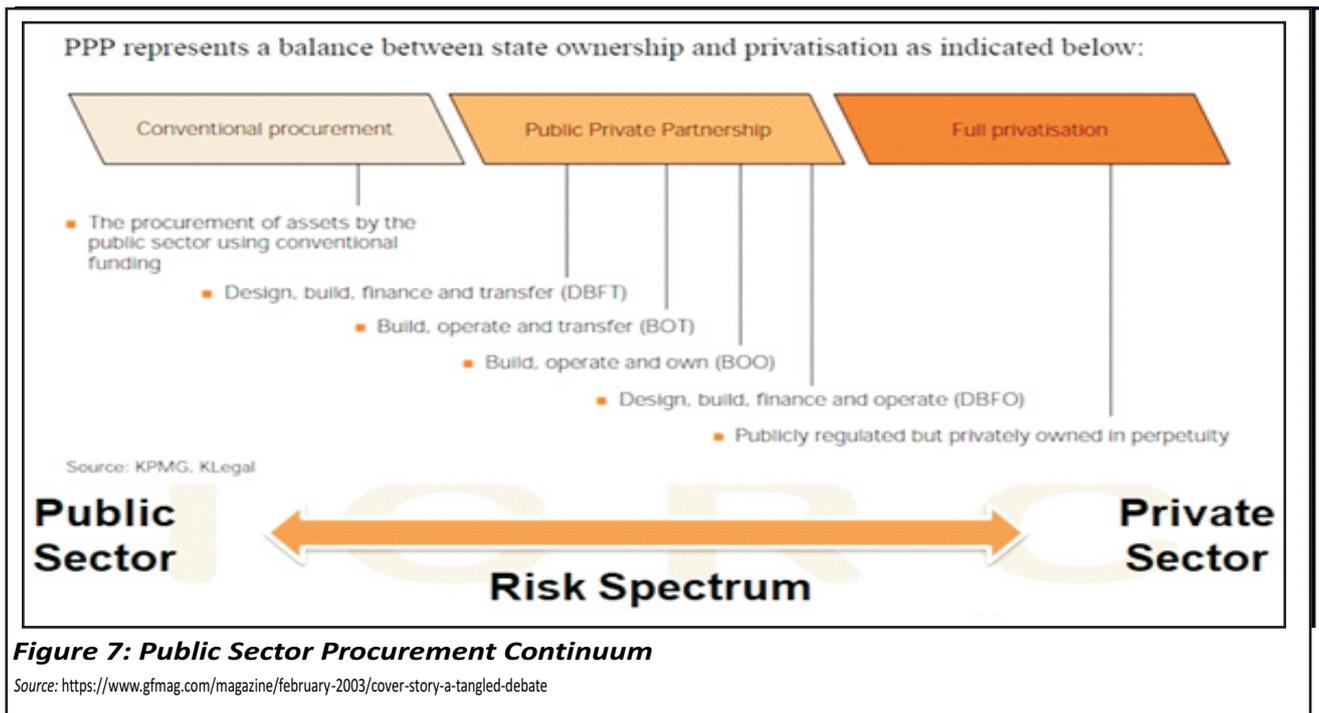


Figure 7: Public Sector Procurement Continuum

Source: <https://www.gfmag.com/magazine/february-2003/cover-story-a-tangled-debate>

In the public procurement, therefore, PPPs will be best suited for the procurement of such public goods and services including (a) congestible public goods, such as public parks, roads, bridges, highways, etc.; and (b) price excludable public goods such as education and healthcare. It is for these reasons that PPP lies midway between full privatisation and traditional EPC procurement in the public continuum.

5.2 Benefits of PPPs to the Government and Taxpayers

The benefits of PPPs for the government and taxpayers include: improved service delivery; improved cost-effectiveness; increased investment in public infrastructure; improved budget certainty; makes better use of assets; and other benefits.

- **Improved Service Delivery:** PPPs provide an opportunity to improve service delivery by allowing both sectors to do what they do best. Government's core business is to set policy and protect public interest. It is better positioned to do that when the private sector takes responsibility for non-core functions, such as operating and maintaining infrastructure.
- **Improved Cost-effectiveness:** By taking advantage of private sector innovation, experience and flexibility, PPPs can often deliver services more cost-effectively than traditional approaches. The resulting savings can then be used to fund other needed services.
- **Increased Investment in Public Infrastructure:** Investments in hospitals, schools, highways and other provincial assets have traditionally been funded by the State and, in many cases, have added to levels of overall debt. PPPs can reduce government's capital costs, helping to bridge the gap between the need for infrastructure and the State's financial capacity.
- **Reduced Public Sector Risk:** Public sector risk is reduced by transferring to the private partner those risks that can be better managed by the private partner.
- **Improved Budget Certainty:** Transferring risk to the private sector can reduce the potential for government cost overruns from unforeseen circumstances during project development or service delivery.

Services are provided at a predictable cost, as set out in contract agreements.

- **Makes Better Use of Assets:** Private sector partners are motivated to use facilities fully, and to make the most of commercial opportunities to maximize returns on their investments. This can result in higher levels of service, greater accessibility, and reduced occupancy costs for the public sector.
- The use of private finance enables the public to have access to improve services now, not years away when the government's spending plan permits.
- The expertise and experience of the private sector encourages innovation, resulting in shorter delivery times and improvements in the construction and facility management processes. Developing these processes leads to best practice and adds value.
- The tax payer also benefits by avoiding paying higher taxes to finance infrastructure investment development.
- The PPP process requires a full analysis of projects risks at the outset. This fuller examination of risks, by both the government and lenders, means that cost estimates are robust and investment decisions are based on better information.

Other benefits of PPP to the government and tax payers include construction is completed to plan and to budget; repairs and maintenance are planned at the outset and, in consequence, assets and services are maintained at a pre-determined standard over the full length of the concession.

5.3 Benefits of PPPs to the Private Sector

PPPs give the private sector access to secure, long-term investment opportunities. Private partners can generate business with the relative certainty and security of a government contract.

Payment is provided through a contracted fee for service or through the collection of user fees – and the revenue stream may be secured for as long as 50 years or more. Also, private sector partners can profit from PPPs by achieving efficiencies, based on their managerial, technical, and financial and innovation capabilities. Furthermore, the private sector partner can also expand their PPPs capacity and expertise – or their expertise in a particular sector – which can then be leveraged to create additional business opportunities. For example, the company can market its experience in other jurisdictions, once it has established a track record of working successfully with the public sector in Nigeria.

5.4 Enabling Environment for PPP

Enabling environment must be in place to ensure security and predictability of investment and value-for-money (VfM). The enablers include favourable investor climate, public commitment, risk management, and public sector capacity. PPP arrangements thrive under well-defined legal and regulatory frameworks, PPP policy and supportive national and sectorial laws. These frameworks allow contracts to be determined with certainty, allow parties understand the boundaries of their engagement, and allow contracts to be determined with certainty. The absence of a favourable climate leads to increased riskiness, cost and suboptimal project performance.

Public commitment is reflected in strong political support and appropriate policy framework consisting of land and right-of-way, permits, licenses, guarantee of alternative routes on transport projects, access to government capital grants and loans. Examples of enablers include, viability gap funding (VGF), sovereign guarantees, toll fee policy, construction of complementary facilities, and sanctity of contracts.

PPPs are averse to uncertainty. Uncertainty are political, legal, or regulatory. Uncertainty increases project cost and prevents private investment. The existence of effective frameworks for identifying and procuring the

partner in the best way to mitigate and limit uncertainty.

5.0 THE PPP FRAMEWORK IN NIGERIA

The Infrastructure Concession Regulatory Commission Act, Act 2005; together with the National Policy on PPP which provides guidance on PPP project structuring, provides the legal and regulatory framework for PPPs in Nigeria. In addition, the Presidential Circular of September 2013 directing all MDAs to engage with the Federal Ministry of Finance (FMoF) and the ICRC before commencing PPP projects, and the establishment of PPP units in all ministries, departments, and agencies of the Federal government, provide further support and clarity to the existing framework.

6.1 Governance Structure:

The Commission reports to the President through the Secretary to the Government of the Federation. The Governing Board composed of a Part-time Chairman, the Secretary to the Government of the Federation, Attorney General of the Federation, and the Minister of Finance. Others include the Governor of the Central Bank of Nigeria, one member from each of the 6 geopolitical zones of the country, and the Director General ICRC-Member/Secretary.

6.2 ICRC's Functions

Based on the enabling legislation, the ICRC is required to regulate public private partnership (PPP) procurement by guiding MDAs in structuring PPP transactions for both green field and brown field infrastructure (*Pre-Contract regulation*). The Commission is also required to take custody of all executed agreements and ensuring compliance (*Post-Contract Regulation*); issue PPP regulations and guidelines; and collaborate with State Governments to develop a sustainable national framework.

It is important to clarify certain issues relating to the powers and duties of the ICRC that has often been misrepresented in public discourse. First, the ICRC, as a regulatory agency, does not initiate PPP projects. It is the responsibility of the MDA responsible for providing the underlying public

service to identify, prioritize and select projects for PPP procurement. Second, it is also the MDA's responsibility to prepare and develop the infrastructure projects. Third, the approval of the project for procurement through the PPP arrangement is the responsibility of the Federal Executive Council. Last, it is not the responsibility of the ICRC to enforce court judgments over PPP transactions. That is the mandate of the courts.

6.3 The PPP Process

The PPP process comprises a number of iterative but sequential phases starting with project initiation, through to project preparation, project procurement, project implementation and ending with the return of the asset to the government. Underlying this process is an assumption of expert knowledge, experience, and skills required to go through these phases. The MDAs will identify the projects at the project initiation phase. The MDA are required to engage the ICRC prior to commencing PPP process to ensure viability and bankability of proposed projects. The MDA also need to consult and engage with the FMoF to structure financing and ensure alignment of project and its contingent liability with the FGN's fiscal objectives prior to commencing PPP projects.

The ICRC Act requires the MDA to engage a Transaction Adviser (TA) as required under the Public Procurement Act of 2007 to provide professional guidance throughout the PPP process. The TA will prepare the Outline Business Case (OBC) for the review and subsequent issuance of the OBC Certificate of Compliance. Thereafter, the MDA submits OBC to the Federal Executive Council (FEC) for approval and upon the FEC approval, the MDA's commences the procurement of private partner under the guidance of the TA. Upon procurement, the MDA negotiates with preferred investor and submit the Full Business Case (FBC) to the ICRC for further review and issuance of an FBC Certificate of Compliance. The MDA is also expected to submit FBC to the FEC for final approval. Afterwards, the MDA signs the PPP contract with the private partner and forwards the signed contract to the ICRC for custody; and the MDA and preferred PPP Project Proponent (investor) achieve financial

close.

Subsequently, the ICRC and the MDA will conduct regular joint inspections of the project until the end of the contract.

6.4 PPP Principles

There are a number of principles that provide guidance to the PPP process. The principle of value for money (VfM), public interest, output requirements, transparency, risk allocation, competition, and capacity to deliver.

While VfM principle requires that project's appraisal take into account not only cost but also risks and quality of public service to be provided, public interest requires that the service to be procured under the PPP arrangement must be in the public interest, there must be adequate and prior consultation with stakeholders before commencement.

The principle of output requirements requires that the concept of "verifiable service standards" should be used as basis for output or performance based specifications.

Whereas transparency of procurement transaction is a key requirement of the law, the principle of risk allocation requires that the project risks be allocated to the party best able to manage them.

The principle of competition is fundamental to the PPP to ensure affordability, as competition tends to reduce project costs. Besides, it is a legislative requirement that no project is procured without subjecting it to competition.

Last, the principle of capacity to deliver ensures that private sector operators wishing to partner with government to deliver and operate infrastructure have the capacity to handle the responsibility.

7. CONCLUSIONS

Nigeria has developed a 30 year NIIMP requiring an infrastructure spend of over \$ 3.1 trillion dollars over 30 years to achieve the benchmark 70%

infrastructure stock for emerging countries. Sectoral spending requirements over the next 5 years are Energy (\$48 billion), Transport (\$36 billion), and Agriculture and Water (\$18.5 billion). It is expected that over 40% of this infrastructure spending will come from the private sector.

For the aviation sector, the spending requirements are estimated to be \$5 billion over the next 5 years and \$50 billion over the 30 years NIIMP timeframe. In truth, Nigeria is in a race for funding with other countries.

A French company signed \$1.5 billion for the 25 year Power and Water Purchase Agreement for its 6th Independent Water and Power project in Abu Dhabi. India plans to spend \$1 trillion in its 12th development plan, making its PPP regime more competitive.

The Indonesian Central Government has decided to use PPP financing in the region of \$31.47 billion in its infrastructure development. The Saudi Arabia reconstruction and expansion of Medina airport at a cost of US \$ 1.2 billion under a Build-Transfer-Operate PPP model (Source: ACCA Global Report 126 and Partnership Bulletin).

The FGN is looking to Public-Private Partnership (PPP) to meet its critical infrastructure gap and improve resource management/service delivery to the people. By so doing, it hopes to share risk and responsibility with the private sector, but ultimately retain accountability and control with improved resource utilisation and service provision; while avoiding the politically contentious aspects of full privatisation, unemployment, higher prices and corruption.

This paradigm shift is inevitable, given the increasing mismatch between government resource and expanding and competing needs.

PPPs offer dependable and sustainable funding, increased accountability, accelerated infrastructure provision and faster implementation of projects. Nigeria's huge infrastructure deficit has also thrown up opportunities for investment in virtually all physical infrastructure and resource extraction

sectors, notable roads, rail, waterways, aviation education and power.

Case studies show that those partnerships that have been most successful in Africa have been characterised by thorough planning, good communication, strong commitment from parties and effective monitoring, regulation and

enforcement by government. Project preparation is key PPP.

With the appropriate legal and regulatory framework and strong political commitment, the FGN government believes that PPP will offer value for money to Nigeria and good opportunities for investors, and ultimately fill the infrastructure gap.

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CENTRAL BANK PUBLIC COMMUNICATION CAMPAIGN AND MONETARY POLICY



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ABSTRACT

This paper examines the relevance of public communication campaign in a central bank's quest to adequately communicate monetary policy decisions to its stakeholders. The meaning, design and evaluation of public communication campaign are discussed to highlight campaign's usefulness in monetary policy communication. Its limitation are also noted with regards to the discussion of technical or complex issues in monetary policy.

INTRODUCTION

In today's economic and financial world, there is the need for central banks to explain in clear and transparent terms, how they intend to achieve their objectives. The need to know is ever-present as most stakeholders require adequate information to enable them to take informed decisions.

Carvalho & Nechio (2014) emphasized the need for central bankers to communicate with the public to improve their understanding of monetary policy. As the argument goes, this should allow households and firms to make better-informed price- and wage-setting decisions, and improve policy effectiveness. More generally, agents understanding of how policies that affect their decisions are conducted remain a key ingredient in the policy transmission

mechanism. This perception is guided by economic theories in which the behavior of the economy depends on the interaction between the actual conduct of policy and agents understanding of it.

In the opinion of Bernanke (2013), the public's expectations about future monetary policy actions matter today because those expectations have important effects on current financial conditions, which in turn affect output, employment, and inflation over time. For example, because investors can choose freely between holding a longer-term security or rolling over a sequence of short-term securities, longer-term interest rates today are closely linked to market participants' expectations of how short-term rates will evolve. If monetary policymakers are expected to keep short-term interest rates low, then current longer-term interest rates are likely to be low as well, all else being equal. Thus, for monetary policy, expectations matter.

It has therefore become almost obligatory for central banks, especially in the developing countries where financial education is poor to evolve efficient and effective channels of communicating with economic agents, to ensure that all are carried along, regarding economic and financial policies.

Meanwhile, Thomas Patterson (in UVM Writing Center web page) defines Public Communication as the practice of understanding, designing, implementing, and evaluating successful communication campaigns within a framework of public service. It is used to inform & persuade, to build relationships, and to encourage open dialogue in the public interest. There is a thin line of difference exists between mass communication and public communication as they are all directed towards the stakeholders or economic agents. However, this paper tends towards the appeal of public communication which embraces exchange or transaction of ideas. This is somewhat tepid in mass communication. In the opinion of Anskar-Ahy (2012) public communication's normative task is to support the legitimacy of collective decisions. He noted

further that public communication is decision-oriented and that in order to understand public communication as conducive to the legitimacy of collective decisions, share *dex ante* definitions of the purpose of public communication and the composition of the public sphere are required.

COMMUNICATION AND MONETARY POLICY

Communication is a useful tool to help mirror the transparency of central banks. There is need for central banks to explain monetary policies to the relevant stakeholders in unambiguous language, using appropriate media. Amato *et al* (2003) corroborated this view by noting that communication is an integral part of modern monetary policy and that central banks have placed growing emphasis during the past decade towards greater transparency by explaining the modes of communication and the amount of information revealed to the public.

Consequently, in the view of Ekor *et al* (2013), communication enhances the predictability of monetary policy decisions and by extension its transparency. Given that transparency is defined as 'the absence of asymmetric information between policy makers and the public', the expectation is that markets should be able to anticipate monetary policy decisions reasonably well. Furthermore, Ekor *et al* noted that it remained unarguable that in the event of poor communication by the central bank, market volatility may become more pronounced.

Central banks should communicate among other issues, its proposed long term strategic policy actions needed to actualize its primary long-term objectives, explain rationale behind monetary policy decisions, its economic outlook, and policy rate path. While doing these, a central bank should also be clear, transparent, open, timely, consistent and credible in its communication (Tule *et al*, 2001).

Evans (2014) opined that communications are critical for effective monetary policy strategy as they are inextricably linked. In his view, as the President of the Federal Reserve Bank of Chicago, there are different approaches to, and much debate regarding, best practices. One approach is

to have a full-throated discussion at the monetary policy meetings, release a statement summarizing Federal Reserve Bank's view and then have the Governor hold a quarterly press conference to announce and explain the policy action to the public. This approach also includes describing how the action is intended to achieve the policy goal of Federal Open Market Committee (FOMC). These post-meeting communications are followed by the release of the minutes, which give a fuller description of the comments made at the meeting. An alternative approach is to adopt a simple policy rule, like Taylor's 1993 policy rule. The FOMC would follow the policy rule prescription and report on any particular details regarding how the rule was implemented at each meeting. Again, a press conference could be used as a communications enhancement.

A clear expression of policy intentions requires stating the central bank's policy goals clearly and explicitly. These messages need to be repeated – over and over again. It is also necessary to clearly demonstrate Federal Reserve Bank's commitment to achieving these goals in a timely fashion with policy actions.

Levin, (2014) observed that over the past two decades, central banks around the world have made tremendous strides in clarifying their monetary policy communications. Economic and financial developments in recent years have broadly confirmed the importance of clear central bank communications and in many instances have also underscored the scope for significant improvements. In contemplating these issues, it is essential to recognize that the efficacy of central bank communications is inextricably linked to the characteristics of the monetary policy framework.

Commenting on why transparency and communication are important for Monetary Policy, Guinigundo (2006) noted that over the past decade, there has been a trend toward increased transparency and greater communication in the conduct of monetary policy among central banks. Indeed, transparency and communication have increasingly taken on both a

central role in modern monetary policymaking and being part of best practice in monetary policy. Whether too little or too much will depend on each country's circumstances and needs.

He added that this trend is partly born out of necessity. Financial markets worldwide have dramatically developed, expanded and interconnected with one another. Both good and bad monetary policy can be rapidly transmitted to an increasingly seamless global market. It is therefore possible to think of central bank communication strategies as having two main goals: (1) to allow financial markets to anticipate the policy decisions as well as the future path of monetary policy; and (2) to reduce the uncertainty surrounding these expectations. In addition Amato, Morris and Shin (2003) observed that central bank communication is a key determinant of the market's ability to anticipate monetary policy decisions and the future path of interest rates. Empirical support by Ehrmann and Fratzscher (2005), analyzed the impact of communication on the predictability of monetary policy in the US, EU and Japan, and concluded that a higher frequency of communication tends to help markets predict future monetary policy decisions.

Mathai (2009) noted that when a central bank speaks publicly about monetary policy, it usually focuses on the interest rates it would like to see, rather than on any specific amount of money (although the desired interest rates may need to be achieved through changes in the money supply). He posited further that central banks tend to focus on one policy rate—generally a short term, often overnight, rate that banks charge one another to borrow funds. According to him, when the central bank injects liquidity into the system by buying or borrowing securities, also called loosening policy, the rate declines. The rate usually rises when the central bank tightens by soaking up reserves or sells securities. The central bank expects that changes in the policy rate will feed through to other interest rates in the economy.

Bernanke, (2010) (in Carvalho & Nechio, 2014) said stated that improving the public

understanding of the central bank's policy strategy reduces economic and financial uncertainty and helps households and firms make more-informed decisions. Moreover, clarity about goals and strategies can help anchor long-term expectations more firmly and thereby bolsters the central banks' ability to respond to adverse shocks.

WHAT IS PUBLIC COMMUNICATION CAMPAIGN?

Public communication campaigns refer to a deliberate attempt aimed at informing and influencing the behavior of a large audience. It involves the usage of structured communication initiatives that are expressed in mediated messages via appropriate channels. Public communication campaign is generally done over a definite period of time, in the interest of the public.

The campaign process is universal across topics and venues, and utilizes systematic frameworks and fundamental principles developed over the past half century. Campaign designers perform a situational analysis and set objectives leading to the development of a coherent set of strategies by creating informational and persuasive messages that are disseminated via traditional mass media, new technologies, and interpersonal networks.

In the view of Dorfman *et al* (2009), public communications campaign is meant to impart ideas for a strategic purpose and that it involves the use of the media, messaging, and an organized set of communication activities to generate specific outcomes in a large number of individuals and in a specified period of time.

Coffman (2002) noted that public communication campaigns use the media, messaging, and an organized set of communication activities to generate specific outcomes in a large number of individuals and in a specified period of time. This approach maximizes their chance of success. Campaigns usually coordinate media efforts with a mix of other interpersonal and community-based communication channels.

– There are two main types of campaigns:

1) *Individual Behavior Change Campaigns* – Its objectives include influencing beliefs and knowledge about a behavior and its consequences, affecting intentions and attitudes in support of behavior, persuading campaign targets with the intention of promoting behaviours that leads to improvement in social well-being.

2) *Public Will Campaigns* - This type of campaign seeks to increase visibility of an issue and its importance, while affecting perceptions of social issues and who is seen as responsible. Furthermore, it attempts to increase knowledge about solutions based on who is seen as responsible for the issues. Public Will Campaign affects criteria used to judge policies and policymakers and help determine what is possible for service introduction and public funding. It engages and mobilizes constituencies to action that attempts to mobilize public action for policy change (Coffman, 2002).

Public Communication Campaign Design

All campaigns are not the same in terms of planning, execution and results. A successful campaign therefore should be designed meticulously to guide against possible flaws during implementation. Public communication campaigns has evolved over time and has become a strategic, potent and sophisticated tool towards achieving public communication goals.

Rice & Atkins, 2012 suggested the following steps with regards to public communication campaign design:

Identifying the Audience

Campaign design begins with a conceptual assessment of the situation to determine opportunities and barriers and to identify which behavior outcome would be performed and by whom. Rather than attempting to reach the broad public, campaign designers typically identify specific segments of the overall population. There are two major strategic advantages of subdividing the public in terms of demographic characteristics, predispositions, personality traits, and social contexts. First, message efficiency can be improved if subsets of

the audience are prioritized according to their centrality in attaining the campaign's objectives as well as receptivity to being influenced. Second, effectiveness can be increased if message content, form, style, and channels are tailored to the attributes and abilities of subgroups.

The design specifies focal segments of the population whose practices are at issue and the primary focal behaviors that the campaign ultimately seeks to influence. The next step is to trace backward from the focal behaviors to identify the proximate and distal determinants and then create models of the pathways of influence via attitudes, beliefs, knowledge, social influences, and environmental forces (ideally grounded in one or more theoretical models). The next phase is to examine the model from a communication perspective, specifying target audiences that can be directly (or, as noted below, indirectly) reached and target behaviors that can be influenced by campaign messages. A sophisticated campaign will seek to affect the most promising pathways guided by a comprehensive plan for combining manifold components and an appropriate theoretical framework matched to the desired outcome and the relevant audiences and social systems (Rice & Atkins, 2012).

The Message

Message Content: Informational Versus Persuasive

In many campaign situations, informational messages that seek to create awareness or provide instruction play an important role. Awareness messages present relatively simple content that informs people what to do, specifies who should do it, or provides cues about when and where it should be done. Even superficial messages can stimulate the audience to seek out richer, in-depth content from elaborated informational resources such as webpages, books, and opinion leaders. The more complex instruction messages present how-to-do-it information in campaigns that need to produce knowledge gain or skills acquisition, including enhancing personal efficacy in bolstering peer resistance and acquiring media literacy skills.

However, the central type of content in campaigns features persuasive messages. Most campaigns present persuasion appeals emphasizing reasons why the audience should adopt the advocated action or avoid the proscribed behavior. For audiences that are favorably inclined, the campaign has the easier persuasive task of reinforcing existing predispositions: strengthening a positive attitude, promoting post-behavior consolidation, and motivating behavioral maintenance over time. Because a lengthy campaign generally disseminates a broad array of persuasive messages, strategists often develop a variety of appeals built around motivational incentives designed to influence attitudes and behaviors (Rice and Atkins, 2012).

Message Appeals: Persuasive Incentives

Persuasive messages in public communication campaigns frequently utilize a basic expectancy-value mechanism by designing messages to influence beliefs regarding the subjective likelihood of various outcomes occurring; attitudinal and behavioral effects are contingent upon each individual's valuation of these outcomes. The operational formula for preventing risky behaviors is susceptibility multiplied by severity, using a loss frame to motivate the audience with a high likelihood of suffering painful consequences. The incentive appeals often build on existing values of the target audience, so the messages tend to reinforce the predispositions or change beliefs about the likelihood of experiencing valued consequences (Rice and Atkins, 2012).

Message Design and Implementation: Qualitative Dimensions

Designing messages involves the strategic selection of substantive material and the creative production of stylistic features. In developing the combination of message components, the campaign designer seeks to emphasize one or more of five influential message qualities. First, credibility is primarily conveyed by the trustworthiness and competence of the source and the provision of convincing evidence. Second, the style and ideas should be presented in an engaging manner via selection of interesting or

arousing substantive content combined with attractive and entertaining stylistic execution. The third dimension emphasizes selection of material and stylistic devices that are personally involving and relevant, so receivers regard the behavioral recommendation as applicable to their situations and needs. The fourth element is understandability, with simple, explicit, and detailed presentation of content that is comprehensive.

Message Sources

The messenger is the presenter who appears in the message to deliver information, demonstrate behavior, or provide a testimonial. Messengers help enhance each qualitative factor by being engaging (attractiveness, likability), credible (trustworthiness, expertise), and relevant to the audience (similarity, familiarity). These attributes can 1) attract attention and facilitate comprehension by personalizing message concepts, 2) elicit positive cognitive responses during processing, 3) heighten emotional arousal via identification or transfer of affect, and 4) increase retention due to memorability. The key categories of public communication campaign purveyors are celebrities, public officials, experts or specialists, professional performers, ordinary people, specially experienced individuals (e.g., victims or beneficiaries), and unique characters (e.g., animated or costumed) (Rice and Atkins, 2012).

Mediated Communication Channels: Mass and Digital

In disseminating messages, most campaign designers still rely on traditional broadcast and print channels that carry public service messages, entertainment–education (E–E) placements, and news coverage. Websites displaying prepackaged informational pages have also been a central campaign vehicle since the late 1990s, although campaigns have increasingly utilized interactive technology (whether online or via DVDs or mobile devices) in recent years.

In assessing the dozens of options for channeling campaign messages, campaign designers take into consideration advantages and drawbacks

along a number of communicative dimensions. Salmon and Atkin (2003) discuss channel differences in terms of reach (proportion of population exposed to the message), specializability (narrowcasting to specific subgroups or tailoring to individuals), interactivity (receiver participation and stimulus adaptation during processing), meaning modalities (array of senses employed in conveying meaning), personalization (human relational nature of source–receiver interaction), decodability (mental effort required for processing stimulus), depth (channel capacity for conveying detailed and complex content), credibility (believability of material conveyed), agenda setting (potency of channel for raising salience priority of issues), accessibility (ease of placing messages in channel), and economy (low cost for producing and disseminating stimuli).

New media offer additional dimensions of campaigning through interactivity, tailoring, and narrowcasting. Interactivity has two primary dimensions, direction of communication and level of receiver control over the communication process, which yield four kinds of relationships between the user and the source (monologue, feedback, responsive dialogue, and mutual discourse) (Rice and Atkins, 2012).

Quantitative Dissemination Factors

Five major aspects of strategic message dissemination are the total volume of messages, the amount of repetition, the prominence of placement, the scheduling of message presentation, and temporal length of the campaign. A substantial volume of stimuli helps attain adequate reach and frequency of exposure as well as comprehension, recognition, and image formation. Message saturation also conveys the significance of the problem addressed in the campaign, which heightens agenda setting and salience. A certain level of repetition of specific executions facilitates message comprehension and positive affect toward the product, but high repetition produces wear out and diminishing returns.

Placement prominence of messages in conspicuous positions within media vehicles

(e.g., newspaper front page, heavily traveled billboard locations, or highly ranked search engine websites) serves to enhance both exposure levels and perceived significance. Another quantitative consideration involves the scheduling of a fixed number of presentations; depending on the situation, campaign messages may be most effectively concentrated over a short duration, dispersed thinly over a lengthy period, or distributed in intermittent bursts of flighting or pulsing. In terms of the calendar, there are critical timing points when the audience is more likely to be attentive or active in information seeking.

Regarding the overall length of the campaign, the realities of public service promotion and problem prevention often require exceptional persistence of effort over long periods of time to attain a critical mass of exposures. In many cases, perpetual campaigning is necessary because focal segments of the population are in constant need of influence as newcomers enter the priority audience, backsliders revert to prior misbehavior, evolvers gradually adopt practices at a slow pace, and vacillators need regular reinforcement (Rice and Atkins, 2012).

CAMPAIGN EVALUATION METHODS

Formative Evaluation

Formative evaluation is the collection of information that helps to shape the campaign. Similar to the practical marketing research approaches and methods that commercial marketers use (Balch & Sutton, 1997 in Coffman, 2002), it is usually done during the campaign's creative design phase. This approach helps to define the scope of the problem, identifies possible campaign strategies, provides information about the target audience, senses what messages work best and how they should be framed, determines the most credible messengers, and identifies the factors that can help or hinder the campaign (Valente, 2001 in Coffman, 2002). Commonly this involves testing issue awareness and saliency through public polling, or messages and materials through interviews and focus groups (Coffman, 2002).

The applicability of general campaign design

principles depends on the specific context (especially types of audiences to be influenced and types of product being promoted), so effective design usually requires extensive formative evaluation. In the early stages of campaign development, designers collect background information about the focal segments and interpersonal influencers using statistical databases and custom surveys to learn about audience predispositions, channel usage patterns, and evaluations of prospective sources and appeals. As message concepts are being refined and rough versions are created, qualitative reactions are obtained in focus group discussion sessions, and supplemental quantitative ratings can be measured in message testing laboratories (Rice & Atkins, 2012).

Process Evaluation

While the campaign is underway, process evaluation assesses the extent to which designed elements are actually implemented and ways in

which the campaign program can be improved for subsequent designers and implementers. Process evaluation is useful for determining effectiveness of campaign management and identifying lessons for overcoming social and structural obstacles (Rice & Atkin, 2012).

CONCLUSION

The aim of this paper is to present public communication campaign as a tool for assisting in monetary policy communication. However, there are areas of public communication that may not be appropriate for this purpose. It should be noted that not all intricacies of monetary policy could be totally explained or broken down for pedestrian analysis; otherwise such explanation might lose the intended communication value and message. To this extent, the use of public communication campaign especially in the areas of audience identification, crafting of message, message design and campaign evaluation will be beneficial.

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DEALING WITH RISKS AND UNCERTAINTIES IN AGRICULTURE: IMPLICATIONS FOR CENTRAL BANK OF NIGERIA INTERVENTIONS



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Abstract

With the majority of the population of the Nigeria living in rural areas, agriculture can be a key driver of economic and human development. However, agriculture is a risky business, especially where small and medium scale farmers often have to deal with a series of risks and uncertainties related to the weather, market, production, technology, political environment etc. The paper discusses key areas in dealing with risks in agriculture which involves much more than dealing with risky events after they occur but through a coordinated risk management processes like establishing the context, risk

identification, risk analysis and other quantitative analytical tools. The key institutional risk sharing systems like credit guarantee and insurance schemes were presented with their merits and demerits. The CBN on its part has put in place some risk mitigating approaches through programmes and schemes like the Agricultural Credit Guarantee Scheme Fund (ACGSF), Small and Medium Enterprises Credit Guarantee Scheme (SMECGS), The Anchor Borrowers' Programme (ABP) as well as establishing institutions (either solely or in conjunction with other stakeholders) like Nigerian Incentive-based Risk Sharing System for Agricultural Lending (NIRSAL) and the National Agricultural Insurance Corporation (NAIC). However, for risk mitigation to be effective under CBN interventions, there is need for the Bank through her linkages with other institutions and agencies to make concerted and purposeful efforts towards ensuring that risk management and coping strategies are incorporated in all loan schemes, simplified and automated risk sharing products are readily available to farmers as well as complete deregulation of the agricultural insurance space among others.

1.0 Introduction

With the majority of the population of Nigeria living in rural areas, agriculture can be a key driver of economic and human development in the country. However, agriculture is a risky business, especially where small scale farmers often have to deal with a series of risks and uncertainties related to the weather, market, production, political environment etc. Risk has both positive and negative aspects, as on one hand, upward price variations for crops and livestock could offer market and investment opportunities.

On the other hand, climatic hazards, decrease in commodity prices and/or increase in input prices could create a very uncertain environment for the farmers, with unfavorable economic and social consequences. This downside risk distorts investments, puts assets in jeopardy, and makes farmers unattractive clients to financial

institutions. As a result, farmers are limited in their capacity to invest in improved and innovative agriculture methods. Banks are very reluctant to lend to farmers and when they do, it is often at very high interest rates (Sandmark et al, 2013).

These effects are even more disastrous for poor farmers, where formal safety nets are absent or very limited. An unstable environment makes it impossible or very hard for them to escape the poverty trap. Overall, the agricultural sector tends to produce less than its potential with a negative impact on society in terms of growth, rural employment and food security. Indeed, without managing risks, farmers' integration in value chains which gives them access to markets is compromised. This is especially important for operators of small and medium-sized farms who could have a surplus to sell in the market.

Following the effects of the food crisis in some parts of Nigeria, national awareness has drastically increased regarding the challenging situation of farmers. The Central Bank of Nigeria as an important stakeholder in the agricultural finance space has mobilized resources targeted at tackling this challenge and deploying systems that protect and improve local food production through targeted risk management and coping strategies like guarantees and insurance in the entire chain of agricultural operations. These approaches include programmes and schemes like the Agricultural Credit Guarantee Scheme Fund (ACGSF), Small and Medium Enterprises Credit Guarantee Scheme (SMECGS), The Anchor Borrowers' Programme (ABP) as well as establishing institutions (either solely or in conjunction with other stakeholders) like Nigerian Incentive-based Risk Sharing System for Agricultural Lending (NIRSAL) and the National Agricultural Insurance Corporation (NAIC).

Indeed, taking away the risk for farmers through these approaches could open space for innovation, unlock financial markets, and improve productivity. For these to happen however, certain challenges have to be identified, their effects x-rayed and implications drawn for prompt corrective actions by policy makers.

This paper is divided into six (6) sections. Section 1 provides a general introduction as well as the objectives of the paper. Section 2 reviews relevant literature on the subject of risk highlighting the definition, occurrence as well as classification of risk in agriculture. Section 3 describes the risk management process delving the various options available in risk mitigation, aversion and coping strategies in agriculture while Section 4 delves into the approaches of the Central Bank of Nigeria to risk mitigation in agricultural financing through programmes and schemes as well as institutional approaches. Section 5 gives detailed challenges to risk mitigation under CBN strategies while section six (6) concludes the paper giving some recommendations on what should be done to improve on risk mitigation under CBN development finance interventions.

2.0 Risk Mitigation in Agriculture: Conceptual Overview

2.1 Definition of Risk

Risk is defined by the Australian/New Zealand Risk Management Standard AS/NZS 4360 (2004) as 'The chance of something happening that will have an impact on objectives'. According to PMBOK (2008), risk is an uncertain event or condition that if it occurs, has a positive or negative effect on a project's objectives. Toma et al 2012, refer to risk as situations in which probabilities targets can be identified for possible results, that is, it can be quantified. Risk phenomenon is often specified in terms of an event or circumstance and the consequences that may flow from it. It is measured in terms of a combination of the consequences of an event and their likelihood.' 'Likelihood' describes how often a hazard is likely to occur; and is commonly referred to as the probability or frequency of an event. 'Consequence' describes the effect or impact of a hazard on a community. Both likelihood and consequence may be expressed using either descriptive words (i.e. qualitative measures) or numerical values (i.e. quantitative measures) to communicate the magnitude of the potential impact (AS/NZS 4360, 2004).

In agriculture, agronomists and engineers tend to define risk as a loss; while economists tend to use

the word as a synonym of “probability of occurrence of a damaging event” (Chaddad, et al, 2010).

Even supposed experts use the term 'risk' in several different ways; these differences cause considerable confusion especially when systematic efforts are made to measure risk and to evaluate it. Among the many usages of the word; three common interpretations are:

- i. The chance of a bad outcome;
- ii. The variability of outcomes; and
- iii. Uncertainty of outcomes.

Although seemingly similar; these three definitions imply quite different ways of measuring risk. Moreover; when formally defined they can be seen to be mutually inconsistent. It will be argued here that; while the first two meanings are in common usage; clarity is best served by defining risk; at least for formal analyses; as the uncertainty of outcomes.

As earlier stated, risk can be quantified; however, when the information necessary for understanding and anticipating developments or changes that may occur in a particular context are either insufficient or unavailable, the situation is defined as uncertain. The key- element in making the distinction between risk and uncertainty is probability. Probability refers to a particular phenomenon or event to occur under well - defined conditions. The state of uncertainty means a set of conditions and factors, unidentified and unpredictable in terms of occurrence and evolution; even if they are identified and predicted they are highly unstable, with their probability being 0. The state of risk is when there is an economic probability that is greater than 0 but less than 1.

2.2 Risk and uncertainty in agriculture

Risk in agriculture is defined as an uncertainty (i.e. imperfect knowledge or predictability) because of randomness. It is regarded as the probability of losses resulting from incomplete control over the processes with which farmers are concerned (OECD, 2000). The sources of these risks and uncertainties in agriculture include, inter alia, the technical, natural, commercial and financial

aspects (Horace, 1959).

Uncertainty about the future works both ways in agriculture. For example, a farmer can win or lose depending on the outcome of events. Constraints of various other kinds also limit the farmer's freedom to make changes in the process of food production (Dalton, 1982). These may consist of simple identities such as the fact that the demand for resources cannot exceed the supply of the resources. According to Dupriez and Leener (1988), farmers are faced with many agricultural production uncertainties which prevent them from acting freely in accordance with their production plans. In such circumstances, they have to take some innumerable and highly diversified risks and uncertainties into consideration.

Uncertainties are also introduced by the legal system, the amount of arable land available, the quality and quantity of the seeds or animal breeds, moral values and also by the technical relationships that exist between activities as is the case in rotational practices. Other causes of uncertainties in agriculture are climate, diseases in man, diseases in crops and livestock and the quality of the implements used by farmers, and so on. For instance, several production factors may be missing at the same time, and if one key factor should prove deficient, say water or seeds, it may be impossible for farming operations to continue effectively and for the farmers to perform efficiently. This is because the farmers have little or no control over these factors. The following are examples of the uncertainties in agriculture which require informed decisions on the part of the farmers to be overcome:

(i) If rainfall is inadequate at the beginning of the rainy season, seeds dry up and the harvest is bound to be poor. Water is the restricting factor in this case.

(ii) If harvest is plentiful and there are not enough workers to bring in the produce, there is a labour shortage or restriction. This means that the workers on the farm are unable to harvest all the produce, particularly at the right time.

(iii) Perhaps a machine will speed up the work of the harvesters, but there is no money to buy or

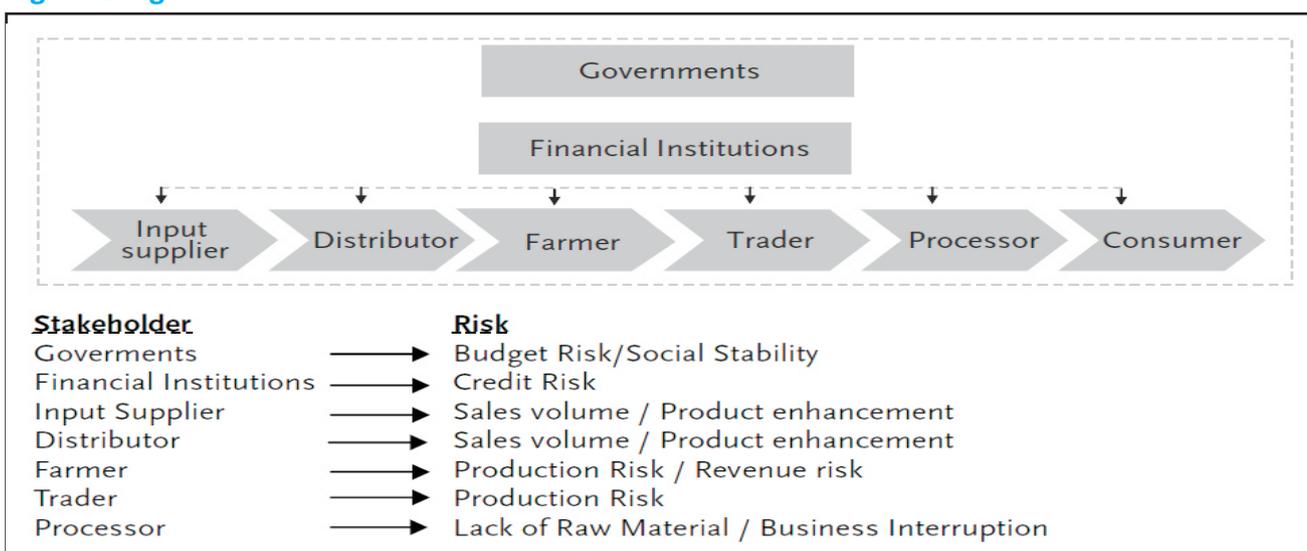
hire it. This is a money constraint.

Agricultural risks not only affect farmers, they also affect the whole agribusiness value chain. Each of the participants along the supply chain, from the suppliers of inputs to the end consumer, is subject to these risks. As the interconnections between the participants in the value chain are becoming more close and complex, the possibilities of adverse events being transmitted between participants are increasing.

The agribusiness value chain and the risks faced by each participant are detailed in figure 1. Agricultural risk management relies on an optimal combination of technical and financial tools. Agricultural value chain participants can use

several tools whenever they are available, to deal with these multiple sources of agricultural risk. Agricultural value chain players may avoid risk; for instance, by choosing not to select a particular crop or crops which they consider of high risk for the area in which their farms are located. They may also mitigate risks by seeking to lessen the risk through planting crops only in very favorable conditions or developing further their infrastructure to improve irrigation or minimize the effects of draught. Also, they may transfer all or part of the risks to a third party through an insurance contract or guarantees. They may also mitigate the financial effects of these risks by creating emergency reserves from profits in good years— a form of self-insurance.

Figure 1: Agribusiness Value Chain and Risk



Source: Iturrio (2009)

2.3 Classifications of agricultural risks

According to Theuvsen (2013), agriculture has always been a risky business due to the handling of living organisms and its exposure to weather conditions and other natural phenomena (such as pathogens, animal diseases etc.).

Other risks originate in the political and social environment of farms, for instance uncertainty about future agricultural and environmental policies, a growing lack of societal acceptance of intensive agriculture, and reluctance of qualified personnel to work in agriculture. Figure 2 enumerates some of the most important risks in agriculture.

OECD (2000) differentiated between risks that are common to all businesses (family situation, health, personal accidents, macroeconomic risks...) and risks that affect agriculture more specifically: production risk (weather conditions, pests, diseases and technological change), ecological risks (production, climate change, management of natural resources such as water), market risks (output and input price variability, relationships with the food chain with respect to quality, safety, new products...) and finally regulatory or institutional risk (agriculture policies, food safety and environmental regulations).

Hardaker *et al.* (2004) distinguish two major types

of risk in agriculture. First, business risk includes production, market, institutional and personal risks. Production risk is due to unpredictable weather and performance of crops and livestock. Market risk is related to uncertainty about the price of outputs and, sometimes also inputs, at the time production decisions are taken. Institutional risk is due to government actions and rules such as laws governing disposal of animal manure or the use of pesticides, tax provisions and payments. Personal risks are due to uncertain life events such as death, divorce, or illness. Second, financial risks result from different methods of financing the farm business. The use of borrowed funds means that interest charges have to be met before equity is rewarded which may create risk due to leverage. Additionally there is financial risk when interest rates rise or loans are unavailable.

Musser and Patrick (2001) defined five major sources of risk in agriculture. Production risk concerns variations in crop yields and in livestock production due to weather conditions, diseases and pests. Marketing risk is related to the variations in commodity prices and quantities that can be marketed. Financial risk relates to the ability to pay bills when due, to have money to continue farming and to avoid bankruptcy. Legal and environmental risk concerns the possibility of lawsuits initiated by other businesses or individuals and changes in government regulation related to environment and farming practices. Finally, human resources risk concerning the possibility that family or employees will not be available to provide labour or management.

Moschini and Henessy (2001) prefer to talk about sources of uncertainty in agriculture, singling out four different sources.

- a. Production uncertainty. The amount and quality of the output that will result from a given bundle of production decisions are not known with certainty. Uncontrolled elements such as weather conditions play a fundamental role in agricultural production.
- b. Price uncertainty. Production decisions

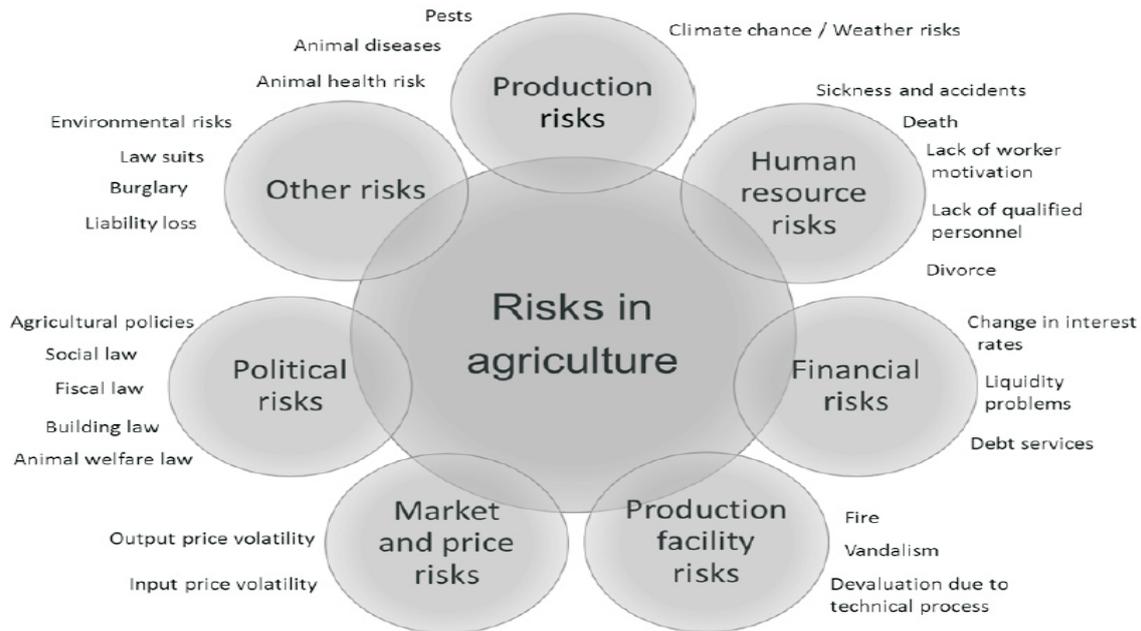
have to be made far in advance of realizing the final product. The price of the output is typically not known at the time the production decisions are taken. Inelastic demand is often cited as a main explanation for agricultural price variability.

- c. Technological uncertainty. The evolution of production techniques may make quasi-fixed past investments obsolete. Research and development efforts are typically not made at the farm level but at the input supplier firm level.
- d. Policy uncertainty. Besides the general economic policies that affect agriculture as any other sector (taxes, interest rates, exchange rates...) agriculture is typically characterised by an intricate system of government interventions, changes in which may create risk for agricultural investment.

The more general literature on risk management, particularly when related to developing countries, typically includes non-agricultural specific risks in the classification. The World Bank (2000) classifies risks in six different types: natural, health, social, economic, political and environmental. They also cross this typology with an additional dimension of systemic characteristics of different risks: micro or idiosyncratic risk that affects the individual, Meso-risk affecting a whole community, and Macro or systemic risk affecting a whole region or country. All the risks they mention affect farmers in some way, particularly natural (rainfall, landslides, floods, droughts...), health (animal and plant) and environmental risks. Furthermore, most of these risks eventually take the form of economic risk that affects the stream of income, consumption and wealth.

Any classification of risks underlines the fact that an individual farmer may be facing very different risks at the same time. In these conditions, the optimal choice of a strategy to deal with them requires that correlations among risks be accounted for. Some key risks faced by farmers are shown in table 2

Figure 2: Risks in Agriculture



Source: Näther and Theuvsen 2012.

3.0 The Risk Management Process and Assessment

The Risk management process includes much more than dealing with risky events after they occur. It involves the identification of risky events in the organization in advance given the likelihood and consequences of such events to react in an appropriate way. Risk management is a complex process which can be summarized in five consecutive steps (Figure 3) viz. establish the context, risk identification, risk analysis, risk assessment and risk management. These processes are backed with continuous monitoring and review.

i. Establish the context

Defining the context is the first step in the risk management process. It starts by identifying the relationship between the farm and its environment, taking into account the strengths, weaknesses, opportunities and threats related to the farm. The basic risk management instruments through which risks will be managed must be determined in this stage. Given the impossibility to deal with every risk all at once, some priority setting must be built in this stage by starting with risks which are expected to be more dangerous.

ii. Risk identification

Risks in agriculture are obviously endless. Thus,

the aim of the risk identification step is to filter those events that are predicted to have a notable effect on the attainment of the farm's performance by answering the following questions: What might happen, why and how might it happen, and how the organization might be affected (Hardaker et al. 1997).

iii. Risk analysis

Risk analysis seeks to estimate the chance of risk occurrence, and assess the magnitude of negative consequences. Thus, it will be able to classify risks into low/high probability/impact (Hardaker et al. 1997).

iv. Risk assessment

Risk assessment is concerned with decision making based on the outcome of the risk analysis step. The decision making has to include two aspects: Firstly, which risks need treatment and treatment priorities? Secondly, identification of those risks for which current risk management practices are not appropriate, so that further strategies must be developed.

v. Risk management

It follows the risk assessment to identify the range of treatment options such as ignorance, acceptance, reduction, avoidance and transfer of risks. After that, it proceeds in selecting and

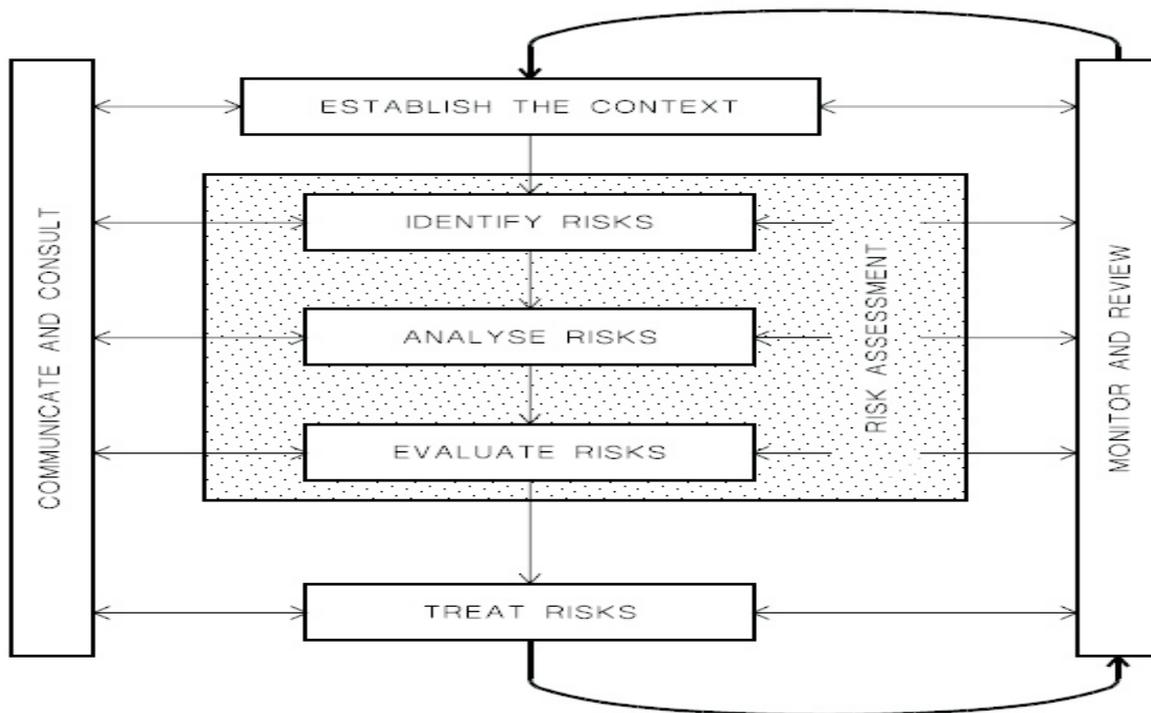
implementing appropriate options to deal with risks.

vi. Monitoring and review

Monitoring and review based on communication and information exchange are necessary to

ascertain that the risk management plan is working, and to identify aspects where further decisions need to be made (Hardaker et al. 1997). Perfect information access is very essential in such a step.

Figure 3: Risk Management Process



Source: Australian/New Zealand Risk Management Standard AS/NZS 4360 (2004)

3.1 Risk Assessment

Although being aware of a risk is clearly important, before consideration of managing it, the risk being considered must be assessed. In this regard, risks (and their impacts) are assessed by quantifying three main variables: hazard, vulnerability, and exposure (World Bank, (2011).

- a. **Hazard:** The categorization of the type of risk being considered—for example, weather, price, pest, policy, or market. The quantification of the hazard is then undertaken by assessing three subvariables:
 Frequency: How often or likely is the risk to occur?
 Severity: What are the likely fiscal impacts of such a risk if it occurs?

Spatial extent: How widespread would the impact of the risk be—one person? one village? one country?

- b. **Vulnerability:** This is an estimation of what the impact of the realized risk would be given the assets affected by the event and taking into account the current ability to manage the impact.
- c. **Exposure:** The identification of the location of crops, livestock, and farm holdings that may be directly impacted by the hazard. Interdependency in the supply chain leads to indirect exposure for other parties.

Clearly this process of risk assessment involves the use of a number of assumptions and variables, so risk modelling is increasingly used as a tool to allow the development of probability

estimates for financial losses. It should be noted that agricultural risk assessment is particularly dependent on the relationship between the timing of the loss event and the agricultural calendar. This is largely due to the fact that crop or livestock vulnerability varies according to the growth stage and season. In addition, risk assessment in agriculture is further complicated by the fact that vulnerability is heavily influenced by many local variables, such as soil, crop varieties, cultural practices, irrigation, and drainage. The use of and access to local knowledge and information is therefore essential to the interpretation of agricultural risk within a given area.

3.2 Risk Mitigation, Aversion and Coping Strategies in Agriculture

Farmers in various places have been reported to adopt some risk management and coping strategies in response to some uncertainties and risks that are encountered in their agricultural operations. According to European Commission (2006), the tools for risk management in agriculture are distinguished in strategies concerning on-farm measures (diversification of the production programmes) or risk sharing strategies like marketing contracts, production contracts, hedging on futures markets, participation in mutual funds, guarantees and insurance schemes.

According to World Bank (2011), the Agricultural Risk Management Team (ARMT) at the institution, proffered three clear approaches to risk management:

- **Mitigation** is the lessening or limitation of the adverse impacts of hazards and related disasters. Risk mitigation options are numerous and varied (for example, crop and livestock diversification, income diversification, soil drainage, mulching, use of resistant seeds, avoidance of risky practices, and crop calendars).
- **Transfer** refers to the transfer of the potential financial consequences of particular risks from one party to another. While insurance is the best-

known form of risk transfer, in developing countries the use of informal risk transfer within families and communities is extremely important.

- **Coping** refers to improving the resilience to withstand and manage events, through ex-ante preparation and making use of informal and formal mechanisms in order to sustain production and livelihoods following an event. Although we have noted that coping is an ex-post activity, it is possible to plan and to prepare for coping activities on an ex-ante basis. This is often fiscally beneficial, as the ability to quickly respond to events often reduces losses.

A fourth approach is that of risk avoidance or risk prevention. However, this is rarely possible in agricultural production, especially in developing countries like Nigeria where there are very few alternative sources of non-farm employment.

Studies have reported various other coping strategies adopted by farmers in mitigating the risks and uncertainties they encounter in terms of labour in some parts of the world. For instance, Kochar (1995) reported that labour supply adjustment rather than asset or other strategies is the main strategy used in India to avoid labour related uncertainties. Moser (1998), in his study in Zambia, reported that children were being taken out of school in response to adverse income shocks to work. Plant diseases are caused by a wide range of pests such as insects, worms, fungi, bacteria, viruses, birds, rodents and sometimes other mammals as well. The following practices are recommended for farmers to use in order to avoid, mitigate or minimize such risks and uncertainties as might be determined by specific circumstances:

- i. Sources of infection should be wiped out e.g. the nests.
- ii. Choosing disease-resistant plants for crop production and seed propagation.
- iii. Practicing good crop rotation and plant association should be maintained.
- iv. The use of chemical products should be

adopted, particularly if the farmer can afford them. This is a good means of fighting diseases and disease carriers.

v. Growing crops in mixture is also another inexpensive way of tackling the problems of pests where the farmer cannot afford pesticides.

In situations whereby farmers are confronted by economic and technical risks, some measures could be taken in order to reduce the uncertainties associated with production activities. For instance, when a farmer falls ill, when prices of inputs and outputs plummet, when unforeseeable expenses have to be covered, when land and money are short, and when transport services become inadequate etc. If cases like these occur, whether on farms, in villages, over a region or even nationwide, farmers can try the following as mitigation measures:

- i. Adapting and improving agricultural methods
- ii. Setting up reserves of food and money
- iii. Promoting mutual help schemes; and,
- iv. Making farm and village activities as varied as possible.

3.3 Institutional Risk Sharing Systems in Agriculture

Various institutional risk sharing systems are available in agriculture. These include strategies like marketing contracts, production contracts, hedging on futures markets, participation in mutual funds, credit guarantee and insurance schemes. The most predominant in Nigeria however are credit guarantee schemes and Insurance.

a. Credit Guarantee Schemes (CGSs)

A Credit Guarantee Scheme (CGS) is any scheme under which guarantees are provided to investments according to certain conditions of duration, amount, nature of transaction, the type or size of the enterprise etc which often lack the kind of collateral required by banks. There are four main types of guarantees:

(i) Individual guarantees that provide partial coverage on the underlying principal loan amount with both borrower and lender clearly identified;

(ii) A guarantee directed at an investment facility. This is normally employed when a developing economy already has functional capital markets in place, and medium to long term placements of investment funds need to be generated;

(iii) Portfolio guarantees in which lending to a specified priority development sector is supported by providing a partial guarantee for a number of loans (one lender, many borrowers);

(iv) Portable guarantees where one specific and identified borrower is given access to a guarantee and can then compare competing loan terms and offers from various lenders. However, this type of guarantee has the disadvantage of relatively high transaction costs for borrowers and lenders when dealing with new applications.

CGS arrangements are publicly driven and are organized in various corporate or legal forms, ranging from state operated financial institutions, state funded companies and government guarantees. Other forms which tend to be successful are independent private corporate entities, credit guarantee foundations or associations, mutual guarantee associations, and specialized single purpose guarantee corporations. In the latter form, it is easier to monitor efficiency since operating costs and staff time are all devoted to the same objective and it is easier to measure contributions made by each department. Finally, an adequate sharing of risk between guarantor, lender and borrower that avoids moral hazard; fast and trustworthy claim procedures, and fee arrangements that encourage guaranteed loan repayment have a bearing on a CGSs' market acceptance by lenders and borrowers and on their eventual success.

The efficacy of CGSs is determined by several factors including the following:

- i. The guarantee fund's clarity of purpose of guarantee;
- ii. Leverage (i.e. value of credit generated per unit value of the guarantee fund);
- iii. Governance and management;

- iv. Geographical coverage;
- v. Targeted borrowers; and
- vi. Eligible financial services providers.

The common argument against CGSs relates to moral hazard issues stemming from the fact that CGSs weaken the will and commitment of the borrowers to repay the loan given, that they know that a guarantee fund will reimburse the lending institution. However, this threat could be reduced if borrowers value access to specific types of credit products that would otherwise be denied if they failed to repay. Lack of transparency in the presentation of financial results of most CGSs contributes to their fragility and potential misuse due to political influence that often diverges from commercial or development interests. The experiences of the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) in India attest to this point. However, sound governance and autonomy has been achieved in other experiences, such as that of the Rural Development Foundation in Estonia (Zander et al. 2013).

b. Insurance

According to IICA (2008), Insurance is defined as the equitable transfer of the risk of a loss from one entity to another in exchange for a premium. The risk bearing entity is the insurance company. The company assumes this liability once it accepts payment of a premium amount determined by the insurance company. The company carefully evaluates the risks and then determines adequate premiums to cover expected loss payments, administration expenses and a profit margin. The risk transferring entity is the purchaser of the insurance such i.e. the farmer or bank. This party has determined that the risk of loss is too great to assume and so for a certain payment premium, the risk is now transferred to an entity or insurance company that can better afford the potential loss. Insurance has become a fundamental risk finance tool for mitigating risks in agriculture in many developing and developed countries.

There are two fundamental concepts of insurance, regardless of the type of insurance: “adverse selection” and “moral risk”, which are

explained below. Without sufficient safeguards in place to address both adverse selection and moral risk, no insurance program will be successful.

i. Adverse selection: - This occurs when only those parties who know they will need insurance purchase coverage. Insurance companies look for a “spread of risk” much like an investment portfolio spreads risk among a variety of investments. Insuring “say” a single island in the Caribbean is much more problematic for an insurer because one loss could create losses far beyond the premiums generated over the years. Therefore due to adverse selection related issues a regional program for the Caribbean would be much more viable option.

ii. Moral risk is about fraud and corruption. Every insurance underwriter will want to make sure that in the program, the insured or agent does not misrepresent important information that could artificially reduce loss exposures and thereby reduce premiums or inflate actual losses by manipulating crop damage information

c. Agricultural Insurance

Most commonly today, it is the protection of specified crops and livestock against specified natural causes (e.g. drought, flood, pests and wind). It first began as insurance against hail in France and Germany during the 1820s. In the late 1800s, some farmers in the United States began a hail insurance program due to losses to their tobacco crops. This type of coverage still exists in many countries today. Then in 1938, the United States started a program to protect against a wider range of natural disasters which became known as multi-peril insurance. On some occasions, programs offer protection against price risk. Covered losses can occur to crops, livestock, and even aquaculture. Today, the agriculture insurance program is a large industry covering over \$40 billion of production risk (both yield and price) to a wide range of crops and livestock in the United States alone. Many other countries in the western hemisphere, such as Argentina, Brazil, Canada, Mexico and Spain, have also instituted various forms of agriculture insurance.

d. Emergence of Weather Index Insurance (WII)

Weather Index Insurance falls under the category of Index-based Insurance (IBI). Like any insurance product, the purpose of Index-based Insurance (IBI) is to compensate clients in the event of a loss. However, IBI is used to protect against shared rather than individual risk such as the risks associated with weather fluctuations, disease outbreaks or price loss. Unlike traditional insurance which assesses losses on a case by case basis and makes payouts based on individual client's loss realizations. IBI offers policy holders a payout based on the external indicator which triggers a payment to all insured clients within a geographically defined space (ibli.ilri.org).

According to IFAD (2011), the essential feature of Weather Index Insurance is that the insurance contract responds to an objective parameter (e.g. measurement of rainfall or temperature) at a defined weather station during an agreed time period. The parameters of the contract are set so as to correlate as accurately as possible, with the loss of a specific crop type suffered by the policyholder.

All policyholders within a defined area receive payouts based on the same contract and measurement at the same station, eliminating the need for in-field assessment. The typical features of a WII contract are:

A specific meteorological station is named as the reference station.

A trigger weather measurement is set (e.g. cumulative millimeters [mm] of rainfall), at which the contract starts to pay out.

A lump sum or an incremental payment is made (e.g. a dollar amount per mm of rainfall above or below the trigger).

A limit of the measured parameter is set (e.g. cumulative rainfall), at which a maximum payment is made.

The period of insurance is stated in the contract and coincides with the crop growth period; it may be divided into phases (typically three), with each

phase having its own triggers, increment and limit.

Introducing WII to an area requires willing stakeholders: insurers, national weather services and linkages for distribution and support, including Financial Services Providers (FSPs), agricultural value-chain participants and government, which provides the regulatory environment. WII is best introduced using market-based principles and business practices, but often with an important developmental and social agenda.

The payout for index-based insurance relies on the value of an index and not, as for indemnity based insurance schemes, on measurable losses. A threshold is set, below which the insurer will compensate the insured. There are two types of categories – direct and indirect indices:

a. Area yield index insurance, for which the index is directly an area average of yield, livestock mortality, or income.

b. Indirect index insurance, which relies on other kinds of underlying data, such as rainfall, temperature or vegetation indices (computed from weather stations or satellite images) correlated with losses the farmers incur on the ground.

The basic payment structure of a weather-indexed product centres around two main values: the threshold and the limit. The threshold denotes the value of the index at which indemnity payments kick in, and the limit denotes the point at which payments reach a maximum level. Indemnity payments typically increase as the index approaches to the limit, with the rate of increase a function of the threshold, the limit and the actual value of the weather index (USAID, 2006).

The main advantage of Index-Based Insurance as presented on table 1, is that it avoids problems of moral hazard and adverse selection inherent in the classic Indemnity-Based Insurance. Each farmer represents one entity in a large number of producers whose combined performance (calculated by objective measures provided by

meteorological stations, satellite data, or regional-level yield data) determines the value on the index. Moreover, individual loss assessments are no longer needed which decreases the administrative costs and makes the payout process fast and inexpensive.

The transparency of the system can also facilitate the access to international reinsurance markets.

Despite these announced advantages, the aggregate premium volume for Agriculture Index Insurance remains very low and markets remain

underdeveloped, with only a few insurance contracts offered and with low take-up. The sustainability of these schemes, however, requires a very large number of clients to subscribe to the policies in order to maintain low cost premiums.

According to Burke et al (2010), Index Based Weather Insurance products are used at the institutional level in roughly 22 countries including; Columbia, Ethiopia, Mexico, Malawi, Mongolia and 16 Caribbean countries.

Policy Holder	Sales or Distribution Model	Potential benefits of WII
Micro Level		
Farmers Households Small businesses	Farmers buy insurance as part of a package (e.g. credit and other financial services, technology, agricultural information) or occasionally as a stand-alone product Note: FSPs, farmers' associations, processors, input suppliers or NGOs can also act as a distribution channel for micro products retailed to individual farmers	WII payout can: Allow farmer to avoid default and restart production Compensate for additional livestock feed costs Provide income support in lean periods Supplement other sources of household income that may be disrupted Facilitate access to credit Encourage investment in higher-quality inputs
Meso		
FSPs Processors Input suppliers Farmers' associations NGOs	Meso-level institutions buy WII policies (e.g. portfolio or group insurance) to protect their own exposure, and may create payout rules that directly or indirectly benefit farmers	WII opens access to a new client base and helps manage mass defaults caused by weather shocks Meso-level actors can develop innovative linkages along the supply chain (e.g. contract farming, packaging of credit, and inputs) to help manage their risk and open market opportunities
Macro		
Government (or relief agencies)	Government or relief agency is reinsured	Government receives early liquidity following disasters; relief agency is able to fund operations

Source: IFAD (2011)

e. Satellite based index insurance

Founded on the Weather-Based Index model, insurance products have been developed using satellite imagery instead of data collected by weather stations. Unlike other sources of information, satellite imagery offers detailed data for entire continents over many years. From those images, indices are built and are correlated with the lifecycle of the crop. Just like Weather-Based Indices, Satellite-Based Indices necessitate thorough studies on the link between the index and the actual yield. These models are however expensive to set up. An example of a Satellite-Based Index is the Normalized Difference Vegetation Index (NDVI). This index provides an assessment of plants' absorption of moisture through their ability to perform photosynthesis. Charted on a scale between -1 and 1, the closer the index is to 1, the higher the absorption capacity.

4.0 CENTRAL BANK OF NIGERIA'S APPROACHES TO RISKS MITIGATION IN FINANCING AGRICULTURE

The Central Bank of Nigeria intervenes in the real economy in order to achieve a variety of economic objectives. This is driven by the need to provide enabling policy environment for increased lending to priority sectors, improve the access of Nigerians to affordable and long term funds to fast-track real sector development and de-risk lending to encourage financial institutions to finance priority sectors among others. The agricultural sector, which is considered high risk by financial institutions in Nigeria, constitutes an important area of CBN intervention.

Towards de-risking lending to the agricultural sector, the CBN employs the following approaches:

- a. **Programmes and Schemes Approach** – Here the Bank establishes Programmes and Schemes that seek to reduce risks faced by banks in lending to agriculture, thereby enhancing lending to the sector. The Programmes and Schemes created by the Bank with a view to reducing agricultural and other associated risks include; the Agricultural Credit Guarantee Scheme Fund (AGSF), Small and Medium

Enterprises Credit Guarantee Scheme (SMEGCS) and the Anchor Borrower's Programme (ABP).

- b. **Institutional approach** – Here the Bank either independently or in conjunction with Federal Government and other stakeholders sets up institutions with specific roles in de-risking the agricultural value chain. These include institutions like the Nigeria Incentive Based Risk Sharing System for Agricultural Lending (NIRSAL) and The Nigerian Agricultural Insurance Corporation (NAIC).

4.1 Programmes and Schemes Approach

i. **Agricultural Credit Guarantee Scheme (ACGSF)**

The Agricultural Credit Guarantee Scheme was launched in 1977 to reduce the risk borne by commercial banks in extending credit to farmers. Under this scheme, the Central Bank of Nigeria guaranteed up to about 75% of the value of the principal and interest on loans granted to farmers by any commercial bank up to a maximum of N20,000.00 for individuals without tangible collateral, N1,000,000.00 to individuals with adequate and realizable collateral and N10 million for loan to cooperatives and corporate bodies with adequate and realizable collateral. Borrowers also enjoy a rebate of 40 per cent of the interest paid after repayment as and when due. The total loan guaranteed from inception in 1978 to May 2018 is **1,109,164** valued **N111.236 billion**.

ii. **The N200 billion Small and Medium Scale Enterprises Guarantee Scheme (SMEGCS)**

The scheme was established in 2010 to fast track the development of the sector, set the pace for the industrialization of the economy and increase access to credit by small and medium enterprises and entrepreneurs. The scheme provides guarantees on loans by banks to the sector in order to absorb the risks that had inhibited banks from lending to the sector. The beneficiaries of the scheme are small and medium enterprises with total assets not exceeding N500 million and a labour force of 11 to 300 staff. A maximum

amount of N100 million would be guaranteed which could be in form of working capital, term loan for refurbishment or equipment upgrade or expansion and overdraft. The total number of projects guaranteed since inception to date stood at 88 (Eighty Eight), valued N4.251 billion. All the guaranteed projects under the scheme have been fully repaid.

iii. The Anchor Borrowers' Programme (ABP)

The Central Bank of Nigeria in line with its developmental function established the Anchor Borrowers' Programme with a view to collaborate with anchor companies involved in the production and processing of key agricultural commodities.

The Programme is designed to help local farmers increase production and supply of feedstock to

processors, reduce importation and conserve Nigeria's external reserves. Under the Scheme, anchor firms serve as off-takers in recognition of their track record and experience in working with out-growers involved in production. The Scheme involves a finance model whereby the anchor firms, CBN, NIRSAL and State Governments organize the out-growers and ensure that they comply with contractual terms thereby reducing the incidence of side-selling.

The financing institutions serve as veritable channels for delivering credit to the out-growers. As at September 2017, the sum of N45.43 billion had been disbursed under ABP to 216,257 farmers across 30 States in Nigeria.

A comprehensive risk mitigation strategy has been incorporated into the ABP model as presented in table 2.

S/N o	Risks	Mitigants
1	Poor farming techniques/low crop yield	Comprehensive farmer education/technical assistance
2	Skill gap among credit officers in agricultural financing	Value chain finance training for bankers
3	Poor monitoring of the process/project	PMT comprising all stakeholders in place
4	Farmers have no commitment in the Programme	Equity contribution of 5% - 10%
5	No market for products	Off-takers in place with MOUs executed
6	Price variation	Guaranteed Minimum Price by FMARD in place
7	Loss of crops due to floods/drought/natural disasters	NAIC Agricultural Insurance is compulsory
8	Poor quality/fake inputs leading to low yields	PMT selects recognised agro dealers
9	Diversion of funds by farmers	Direct disbursement to agro dealers
10	Side selling by farmers	<ul style="list-style-type: none"> Farmer selection by miller Cross guarantee by all members of the cooperative Miller approves all disbursement requests by farmers Use of extension workers MOU to be executed between the millers, farmers and financing banks to curb the Incidence of Side Selling Cooperative which farmer belongs to be excluded from the Programme and from future CBN funding
11	Default by Miller <ul style="list-style-type: none"> No funds to purchase paddy Reneges on MOU agreement Diversion of funds 	<ul style="list-style-type: none"> CACS funding available for direct purchase of paddy Miller will be banned from future CBN funding Bank debits miller account and credits loan accounts of farmers
12	Default in loan repayment by farmers	50% on credit risk in the event of default
15	Challenges of Infrastructure	Government to provide infrastructural facilities like Fadama feeder roads, irrigation facilities etc

Source: CBN 2015

4.2. Institutional Approaches to Managing Risks in Agriculture

a. The Nigerian Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL)

The Nigerian Incentive-based Risk Sharing System for Agricultural Lending (NIRSAL) is an agricultural financing initiative of the CBN aimed at providing farmers with affordable financial products, while de-risking agriculture and unlocking the access of input suppliers, farmers, agro-processors, and product marketers in the agricultural value chain financing from financial institutions. NIRSAL was

incorporated in 2013 as a Non-Banking Financial Institution, designed to appropriately define, measure, price and share agribusiness related credit risk. It operates as an autonomous private sector institution with a distinct governance structure governed by a Board of Directors. NIRSAL is a \$500Million public liability company wholly owned by the Central Bank of Nigeria.

i. Major Components (Pillars) of NIRSAL

The NIRSAL financing mechanism is based on five solution components namely: Risk Sharing Facility, Insurance Component, Technical Assistance, Agricultural Bank Rating and Bank Incentive mechanism (Table 3).

Table 3: The Five (5) Pillars of NIRSAL

Risk Sharing Facility (\$300M)	Insurance Facility (\$30Million)	Technical Assistance Facility (\$60M)	Agricultural Bank Rating Scheme (\$10Million)	Bank Incentive Mechanism (\$100 Million)
Shares lending risks with banks (e.g. 50% of any loss incurred)	Links insurance products to the loan provided by banks to loan beneficiaries	?Builds the capacity of banks, micro-finance institutions ?Builds the capacity of agricultural value chains ?Expands financial inclusion	?Rates banks according to effective-ness of their lending to agriculture. ?Rates AVC Actors According to Financial, Agribusiness Growth, Tech. Adopt Performance	?Provides incentives that: move banks to a long term, strategic position and commitment to agricultural lending ?Reward Performances by AVC Actors
De-risk agriculture finance value chain		Build long-term capacity	Institutionalise incentives for agriculture lending & AVC Performance	

Source: NIRSAL Plc (2017). The Roles of Agent Networks in Reaching the Last Inch of the Last Mile

ii. NIRSAL's Role in De-risking the Agricultural Value Chain

NIRSAL's core responsibility is to de-risk the agricultural value chain so that banks can lend to the sector with confidence. In this regard, it is NIRSAL's mandate to x-ray reasons why these financial institutions do not lend enough to Agriculture, and devise strategies that will enhance lending to the sector.

NIRSAL absorbs a large chunk (up to 75%) of the

risk, to enable banks and other lenders to lend to agriculture more frequently and comfortably. In this regard, NIRSAL Smoothens the Relationship Between Lenders and Borrower. Banks benefit from the business of lending, because they gain interests from it; and farmers need to borrow, because they can grow their agribusinesses with more money. Therefore, wherever and whenever the interests of the lender (Bank) and the borrower (Farmer) match, NIRSAL ensures that both parties can build a secure business relationship.

NIRSAL also has a programme which it applies to aid the borrower (Farmer) to enable him succeed called the Interest Drawback (IDB). Here, for borrowers that repay their capital and interest as and when due, they regain (from NIRSAL) up to 40% of the interest charged by the lender after every 90 days cycle, effectively reducing the cost of the loan. This is to encourage faithful repayment of loans which will foster the entrenchment of a fluid relationship between Lenders and Borrowers in the Agricultural Sector.

The specific achievements of NIRSAL since its incorporation in 2013 include:

- i. Provision of Credit Guarantees for over 454 Agricultural projects valued at N61.161 billion
- ii. Pay out of over N753.36 million as interest rebate to borrowers who paid back their loans in good time.
- iii. NIRSAL has guaranteed up to 40% (207) of the Federal Ministry of Agriculture's Growth Enhancement Scheme (GES) projects Valued at N39.49 Billion and Paid Interest Draw Back to GES beneficiaries on 91 Projects valued at N439.09.82 Million
- iv. Trained 112,000 farmers/primary producers in 4 value chains: Rice, Cocoa, Cotton and Tomato

a. The National Agricultural Insurance Corporation (NAIC)

The National Agricultural Insurance Corporation (NAIC) was established in 1987 to operate and administer the Nigerian Agricultural insurance scheme. It was created based on a reserve fund for payment of indemnities contributed by the Federal Government, Central Bank of Nigeria, State Governments, and Development Banks etc. The institution was established for the benefit of all categories of farmers either in groups or as individuals. In addition to individual clients, the Scheme operations cover all agricultural loans from banks, public funds, various levels of government and the Bank of Agriculture (BOA). The approved premium rate for the Scheme ranges between 5per cent and 8per cent of the sum insured for crops and 3.5 per cent-7.5 per cent for

livestock. The National Agricultural Insurance Company Scheme is subsidized to the tune of 50 per cent by the Federal and State Governments in the proportion of 37.5 per cent and 12.5 per cent respectively. The farmer is required to pay only 50 per cent of the premium payable. Currently, NAIC has an outreach of about 500,000 farmers in Nigeria. The corporation has, since inception, issued out almost a million policies earning a premium sum of about N2 billion and settled claims worth about N500m to various farmers and cooperative groups. NAIC's performance by premium received and claims paid in year 2014 and 2015 indicates that N1.179 million and N1.073 million were received as premiums in 2014 and 2015 respectively while N3.495 million and 42.910 million were paid as claims in the same period respectively (NAIC, 2015).

5.0 Challenges to Risk Mitigation in CBN's Agricultural Finance Interventions

I. Dysfunctional extension system that seldom educates farmers on how to deal with agricultural risks:- Under ideal conditions, agricultural extension should among other roles educate farmers on the existence of risks and uncertainty in agriculture and the presence of institutional arrangements to help mitigate against such risks.

However, it has widely been reported that the performance of agricultural extension systems have fallen short of expectations, in view of the fact that it has not been able to generate much adoption of Improved agricultural technologies especially risk sharing systems like guarantees and insurance. Knowledge about the existence and usefulness of risk sharing thus is hardly known to Nigerian farmers hence patronage to such products is very low and therefore affect their participation in CBN agricultural finance interventions.

ii. High rate of information asymmetry: The Nigerian agricultural landscape is dominated by informal providers with their activities and operations not captured in the mainstream financial sector therefore difficult to be reached with risk sharing services like guarantees or insurance. This leads to preponderance of risks in agriculture and its continued threat to

agricultural development.

iii. Financial institutions' inability to assess the level of risks involved in agriculture as well as lack of capacity to develop suitable products to meet the needs of rural clients. This is a real challenge to agricultural lending which makes banks to shy away from lending to the sector.

iv. High cost of doing business in the rural areas where most small scale farmers are based. This is especially with respect to inspection and monitoring to obtain information on scattered farms.

v. Political instability and social insecurity have hindered deep penetration of risk sharing and transfer facilities e.g. guarantees and insurance to some areas in Nigeria

vi. High premiums charged by private insurance companies leading to inability to afford insurance coverage by poor rural people

vii. Government policies and subsidies that favours NAIC as sole insurer of government sponsored agricultural programmes to the detriment of private insurance companies

6.0 Conclusion and Implications

The challenges faced by the agricultural sector in Nigeria due to risks and uncertainty are both numerous and enormous especially if their production is to be enhanced from subsistence to income generation based. They will need consistence financial support backed by effective and efficient risk sharing instruments. Towards better management of risks in Nigerian agriculture, the following are recommended:

i. Incorporation of mandatory risk management/coping strategies modules in capacity farmers' building programmes for all CBN agricultural credit schemes and progarmmmes to curb information asymmetry.

ii. CBN should make a regulatory requirement for all agric. desks staff in banks to be well trained in risk management in relation to agricultural value chain, so as to better serve their agricultural clientele.

iii. Need for CBN to liaise with National Insurance Commission (NAICOM) towards the complete deregulation of the agricultural insurance space to create a level playing ground for both private and public institutions. Other insurance firms should be allowed to compete with NAIC in government sponsored agricultural finance programmes at all levels.

iv. There is a need for CBN to enhance their credit facilities delivery through the use of Information and Communication Technologies in their operational framework. This will scale up information sharing and also keep farmers abreast with market situations in terms of prices of commodities, availability or otherwise of inputs and implements etc. In addition, the administration of risk management and coping strategies under CBN initiatives should be automated and simplified so that farmers could apply by using their hand sets.

v. CBN through its linkages with Federal and States' Ministries of agriculture should encourage the resuscitation and overhaul of the extension system by government and managing of risks in agriculture as to constitute the extension services terms of reference. Here, every State government that expresses interest to participate in CBN schemes must commit to train its extension agents in agricultural risk management strategies.

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Does Changes in Monetary Policy Rate in Nigeria have Effect on Interest Rates? Recent Evidence



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Abstract

Since the monetary authority adopted indirect form of monetary policy formulation in 1993, monetary policy rate (MPR) has being one of the monetary tools used by the Central Bank of Nigeria in setting targets and direction of other rates as well as other macroeconomic aggregates. The MPR is expected to communicate the stance of monetary policy and acts as a guide for all other market interest rates. In Nigeria however, there seem to be disconnection between MPR and its effect on interest rates. For instance, since 2016 the Monetary Policy Committee (MPC) had retained MPR at 14% for a long period but this stance of policy barely had much impact on

movement of short term and long term interest rates.

The objective of this study is to find out whether changes in Monetary Policy Rate have any impact on interest rates in Nigeria. The study adopted Multiple Linear Regression Analysis to examine the effectiveness of changes in Monetary Policy Rate on movement in short term and long term rates in Nigeria. The study concludes that the MPR influences the 91-Day Treasury Bills rate to the greatest extent followed by the Inter-Bank Call rate. The results obtained from this study can be used to gauge the effectiveness of MPR in an economy like Nigeria where financial infrastructure is not fully developed.

Keywords: Monetary Policy Rate, Interest Rates, Principal Component Regression, Ridge Regression.

1.0 Introduction

Background to the Study

Monetary Policy Rate (MPR) is a monetary policy instrument used to effect changes in the availability of credit supply in order to stimulate economic growth, price stability and high employment level. MPR as a monetary policy is consider the main policy instrument in effecting the tempo of

economic activities in any economy. In Nigeria, however this seems not to be the case because of the under developed nature of Nigeria financial infrastructure.

The Central bank of Nigeria through its Monetary Policy Committee is mandated to maintain stable single digit inflation in order to spur economic growth. The Central Bank can alter the supply of reserves either by using open market operations to buy or sell government securities or by altering the amount of reserves borrowed through the discount window. This in turn again affects the prevailing interest rate charged by the Government on its 91-Day Treasury bills. Providing fewer reserves than desired by depository institutions puts upward pressure on the price of reserves while supplying more reserves than institutions desire puts downward pressure on the Treasury bill rate. The government influences the prevailing lending rates through the rate it offers to investors investing in their short term treasury bills. This in turn represents a risk free rate for investors. Investors will only be willing to invest in other investment offering similar returns or with higher returns if the risk is high.

In the standard view of the transmission mechanism, the relationship between policy actions and long-term lending rates is assumed to be straightforward. An increase in the desired level of the Central Bank Rate causes current short-term rates and expected future short-term rates to rise, which pushes up interest rates across all maturities. The Monetary Committee used the Central Bank Rate in Nigeria to set the minimum rate at which investors can borrow. This in effect leads to a similar change in the prevailing lending rates. For example, the Central Bank of Nigeria through its Monetary Policy Committee evoked this measure when the inflation was believed to be too high. It raised the MPR rate from 11% to 18% which saw the interest rates increase to above 24%. This explains the relationship between MPR and the prevailing lending rates. In the year 2012, the Central Bank reduced the MPR from 18 to 13% which subsequently saw the lending rates charged by commercial banks reduced from 24% to 18%.

1.1 Overview of Monetary Policy Changes in Nigeria

The Central Bank of Nigeria (CBN) uses MPR which is the anchor rate for other rates in the banking system as a way of influencing the level of economic activities. The CBN adopted various policy instruments in its attempt to effectively influence the quantity of money or interest rates compared to the direct measure applied from 1974-1994. The emphasis is now on market oriented policy measures, which seeks to guide or encourage banks to take certain actions on a voluntary basis. A good example of this measure is the introduction of Minimum Rediscount Rate (MRR) in 1993 as a monetary instrument for the implementation of market driven monetary policy.

The Minimum Rediscount Rate (MRR) which was used as a price-based technique to influence the movement of cost of funds in the economy, however, was still not effective. The introduction of MRR was a way to shift from direct form of monetary policy implementation by the CBN. A change in this rate provides a platform for the monetary disposition of the Bank. Since MRR was not too effective, the CBN eventually introduced the Monetary Policy Rate (MPR) in 2006 which establishes an interest rate corridor of either plus (+) or (-) certain percentage points of prevailing MPR. Given that the effectiveness of MPR in influencing the level of interest rates has not been extensively studied in Nigeria.

In this paper, we tried to explore this avenue. Changes in MPR is expected to affect the cost at which the Central Bank grants assistance to the banking sector and therefore represents a cost of credit to the banking sector.

When MPR is changed, the interest rates on overdrafts and other loans extended by the banks also tend to change. In this way the Central Bank of Nigeria indirectly affects the interest rates in the economy. Before this period, monetary policy was conducted using direct control measures. The direct control in the conduct of monetary policy during this period was characterized by extensive disintermediation.

1.2 Research Problem

Monetary policy, which operates through changes in MPR, is the main lever of macroeconomic management in Nigeria by the Central Bank of Nigeria in pursuit of price stability; this also includes the maintenance of full employment in Nigeria; and the economic prosperity and welfare of the people of Nigeria. Underpinning these macroeconomic goals are exchange rate stability, low inflation and low inflation expectations through the manipulation of MPR. The use of MPR in Nigeria as a monetary policy tool in achieving the above stated objectives seems not to be working. It has been observed that changes in MPR by the Monetary Policy Committee in order to achieve certain macroeconomic goals do not work in Nigeria due to obvious reasons. The objective of the study is to find out whether changes in MPR have any effect on interest rates in Nigeria.

2.0 Literature Review

Rehman, (2010) and Kovanen, (2011) referred to the process by which changes in MPR is transmitted to interest rates as interest rate pass through. This process is simply the rate or process at which the official Central Bank rate is transmitted to other interest rates. Monti and Klein (1971) analyzed a conventional model for the effects of monetary policy rate on market rates. The frame work assumes that if markets are perfectly competitive then the interest rate pass through will be fully symmetrical and swift in response to monetary policy rate. The model assumes the absence of information asymmetry, switching cost and perfect competition in financial markets and by so doing making the full pass through a long run phenomenon, while deviations from long run equilibrium occurs only in the short run.

Kwapilet. al (2006), Marotta G. A. (2009), Kovanen (2011) studies concluded that the interest rate pass through is weak and incomplete. Weth (2002) found interest rate pass through to be weak in the short run but fully complete in the long run. Crespo-Cuaresma, Egert, and Reininger (2004) studies found interest rate pass through to be fully complete in short term. Four major theories exist in the literature to explain the

flexibility of interest rates in the short run. These major theories include; the agency cost theory (Stiglitz and Weiss, 1981), the adjustment costs (Cottarelli and Kourelis, 1994), the switching costs (Klemperer, 1987) and the risk sharing cost (Fried and Howitt, 1980).

Almost all empirical studies on interest rate pass through center on investigation of the degree and speed of adjustment of banking rates to changes in money market rates with some degree of variability in terms of short term and long term adjustment of market rates to monetary policy rates. Bernoth and Von Hagen (2004) studies of interest rate pass through consider the impact of future money market rates on current retail rate setting with the central focus on the search market productivity.

Sander and Kleimerier (2006) conducted a study; it was found that there exists a greater response to anticipated monetary policy changes measures by interest rate features than to unanticipated changes. Other recent studies have gone beyond estimating the degree and speed of adjustment of market interest rates in relation to changes in monetary policy rates to examining the degree and variability of interest rate pass through across countries and regions (Weth 2002; Sorenson and Werner 2006; Sander and Kleimerier 2006; Banerjee, et al 2010; Cas. et al 2010). These studies show the degree of interest rate pass through which differs across regions and across countries.

Aziakpono, Wilson and Manuel (2007) found market interest rates to respond to monetary policy rate, while the study by Aziakpono and Wilson (2010) found that commercial banks' lending rates are more rigid in response to positive shocks in monetary policy official rate in South Africa. Kelilume, (2014) found that the pass-through of monetary policy rate into short term and long term retail interest rate in Nigeria is sticky. The only evidence of the effectiveness of monetary policy can be seen only in the relationship between monetary policy rate and inter-bank rates. Furthermore, he found that the low pass-through rate evident in the study was as a result of the presence of high menu and transaction cost and imperfect financial

condition.

The Nigeria Central Bank Monetary Policy Committee (MPC), which derives its legal backing from the various statutes of the Bank (CBN Act 1958; Decree No. 1997; CBN Act 2007), adopted anchor for monetary policy action on December 11, 2006 with the ultimate goal of achieving stability in the domestic currency, prices and ultimately economic stability through interest rates stability around a benchmark called MPR. At inception, MPR was fixed at 10% with a 600 basis point making a lower band of 7% and an upper band of 13% based on the current and expected inflation. Since inception, the MPR has been changed about fourteen times most of which was positive and was usually done in anticipation of a raise in the general price level. Adjustment of MPR by MPC has ranged from a decrease 20% in the wake of the 2007-2008 global economic crisis to an approximately 30% increase in the period between the third quarter 2011 and the fourth quarter of 2011.

Al-Hassan and Al-kassab (2002) looked at the component between principal components regression and ridge regression using Monte Carlo simulation technique. In their study, broken stick method was to decide how many components to retain. Thirty observations were generated for each of twenty explanatory variables. The numbers of correlated variables were varied from two to twenty. Comparisons were made base on MSE criterion. It was obvious from all stimulations that ridge regression performed better than principal components regression.

Hoerl, Kennard and Baldwin, (1970) cited that in multiple regression, it was shown that least square parameters can be unsatisfactory if the prediction vectors are not orthogonal. Bulut, and Alma, (2011) studied three dimension reduction techniques namely principal component regression, partial least square regression and reduced rank regression and they were illustrated on data set that has small number of observation unit. In their study PCR and PLSR analyses result showed that 7 components explain most of the variability on both explanatory and response

variable, while reduced rank regression (RRR) worth with 2 component.

3.0 Data Collection

The data used for this study were monthly time series observation sourced from the Central Bank of Nigeria statistical bulletin covering the period 2006 M1 to 2016 M1. The major variables used in the model include; Monetary Policy Rate (MPR), Inter-bank call rate, 91-Day Treasury bill, One-month deposit, three-month deposit, twelve-month deposit, saving deposit, prime lending rate and maximum lending rate.

The Central Bank is concerned with the administration of monetary policies. Interest rate was measured by average banking industry lending rates compiled by Central Bank of Nigeria on a monthly basis since 2006 to 2016. The 91-Day Treasury bill rate consisted of the monthly 91-day Treasury bill rate that the government borrows from public. The Inter-Bank Call Rate was sourced from the CBN records same as the interbank rate for the same period. These were used to represent the monetary policies used by the CBN in influencing monetary supply and demand.

3.1 Research Methodology

The theoretical bases for explaining the linkage between the Monetary Policy Rate and short term and long term rates is the marginal cost pricing model also referred to as the monetary policy approach (De Bondt, 2005). Following the Monti-Klein framework (1971) which assumes the existence of a perfectly competitive market devoid of asymmetric information, transaction cost, and menu cost, we assume price equals marginal cost. Under this condition, the derivative of price with respect to marginal cost will be unity. Applying this framework to the relationship between money market rate and retail rate of interest, we develop the model:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_8 x_8 + \varepsilon$$

3.2 Multiple Linear Regressions

Multiple regression analysis was conducted in order to determine the effect of Monetary Policy Rate on interest rates in the Nigeria. The regression equation used was:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_8 x_8 + \varepsilon$$

Where: Y = Monetary policy Rate

β_0 = Constant

X_1 = 91-day Treasury bill

X_2 = Saving Deposit

X_3 = One Month Deposit

X_4 = Three Months Deposit

X_5 = Twelve Months Deposit

X_6 = Prime Lending

X_7 = Maximum lending

X_8 = Inter-Bank Call **Policy instruments**

ε = Error Term

If the coefficient of the pass through term is unity, the monetary transmission mechanism is said to be complete and efficient. However if the coefficient of the pass through rate is such that it lies between zero and unity, the monetary mechanism is said to be incomplete and inefficient.

Therefore, a multiple regression analysis is required to determine the effect of monetary policy rate on key interest rates in Nigeria.

To test for the strength of the model and the relationship between monetary policies and interest rates in Nigeria, the researcher conducted an analysis of variance, ANOVA.

On the extracting table, the researcher looked at the significant value. The study was tested at 95% confidence level and 5% level of significance.

3.3 Principal Components Regression models

In principal components regression method, instead of using regression variables, principal components are used as regression variables. Thus, the replaced regression variables are independent from each other.

In principal components regression model, a subset of principal components is used instead of all components.

The method varies somewhat in philosophy from ridge regression but like ridge, gives biased estimates, when using successfully this method results in estimation and prediction will be superior to LS.

Assume q first components are used in regression model ($q < p$) then, a is estimated as follows:

$$\hat{a}_q = (Z_q^T Z_q)^{-1} Z_q^T Y = \Lambda_q^{-1} V_q^T X^T Y, \dots (7)$$

So that $Z_q = X V_q$ and Λ_q are diagonal matrix of q first eigenvalues (where $\lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_p$) and V_q is a matrix with q corresponding eigenvector. a is defined as $a = V^T \beta$. then, $\beta = V a$ can be written and estimated value of β using principal component method is equal to:

$$\hat{\beta}_{PC} = V \hat{a}, \dots (8)$$

and by replacing \hat{a} with its value in equ 7 with $\hat{\beta}_{PC}$, the following is given for the reduced model

$$\hat{\beta}_{PC} = V_q \Lambda_q^{-1} V_q^T X^T Y, \dots (9)$$

Mean squared error for principal components regression is

$$MSE(\hat{a}_{PCR}) = \sigma^2 \sum_{i=1}^q \frac{1}{\lambda_i} + k^2 \sum_{i=q+1}^p (V_i^T \beta)^2, \dots (10)$$

Where V_i that is the i -th vector of eigenvalues from matrix $X^T X$.

3.4 Ridge Regression model

Ridge regression (RR) has been introduced by Hoerl and Kennard (Hoerl, A. & Kennard, R, 1970, 1975), they suggested a small positive number $k \geq 0$ to be added to the diagonal elements of the $X^T X$ matrix from the multiple regressions, and resulting estimator is obtained as: $\hat{\beta}_{RR} = (X^T X + kI)^{-1} X^T Y, \dots (12)$,

where I is a matrix unit and k is a constant selected by the analyst, $k > 0$.

It is to be noted that when $k = 0$

then the ridge estimator is the least-square estimator. The ridge estimator is a linear transformation of the least-squares estimator $\hat{\beta}_{LS}$

$$\hat{\beta}_{RR} = [I_n + k(X^T X)^{-1}]^{-1} \hat{\beta}_{LS}, \dots (13)$$

Using canonical form of eq 3 the ridge estimator can be written as

$$\hat{a}_{RR} = (I_n + k\Lambda^{-1})^{-1} \hat{a}_{LS}, \dots (14)$$

Mean squared error for ridge regression is

$$MSE(\hat{a}_{RR}) = \sigma^2 \sum_{i=1}^p \frac{\lambda_i}{(\lambda_i + k)} + k^2 \sum_{i=1}^p \frac{a_i^2}{(\lambda_i + k)^2}, \dots (15)$$

Where σ^2 is error variance and a_i is the i -th component of a .

4.0 Data Analysis and Interpretation

The study findings are presented on the effect of monetary policy on interest rates in Nigeria. This section deals with regularization methods and interpretation. The specific variables discussed in this section include: 91-Day Treasury bill rates, Inter-Bank Call rate, Lending Rates and MPR.

4.1 91-Day Treasury bill Rates

The study collected data on the prevailing rates on the 91-Day Treasury bills. In the year 2006, the bill rates started at 4.5% in January and ended the year at 3.25%. In 2007, the rate was 3.36% in January. The rate dropped slightly by February when it reached 3.19% before starting to increase at a fast rate to 4.3% in March to 3.78% in June.

In July, 2007, the rate started to drop. It settled at 3.77% in July and 3.71 in August. The fluctuations continued until December when it reached 3.19%. In 2008, the rate started at 8.58% and dropped continuously to reach a low rate of 6.9% in November.

In 2009, the rate started on the low 3.88%. This low rate was maintained throughout the year with the highest rate being 5.08% in October.

In 2010, the year started with a rate of 3.72% in January as the threat of inflation force CBN to

change its monetary policy stance from expansionary to restrictionary.

The rate remained a little stable during the year by posting little fluctuations from 1.2% to 7.58%. In January 2006 the rate stood at 13.68%. During the year, the rate reduced slightly to the lowest of 6.65% in May.

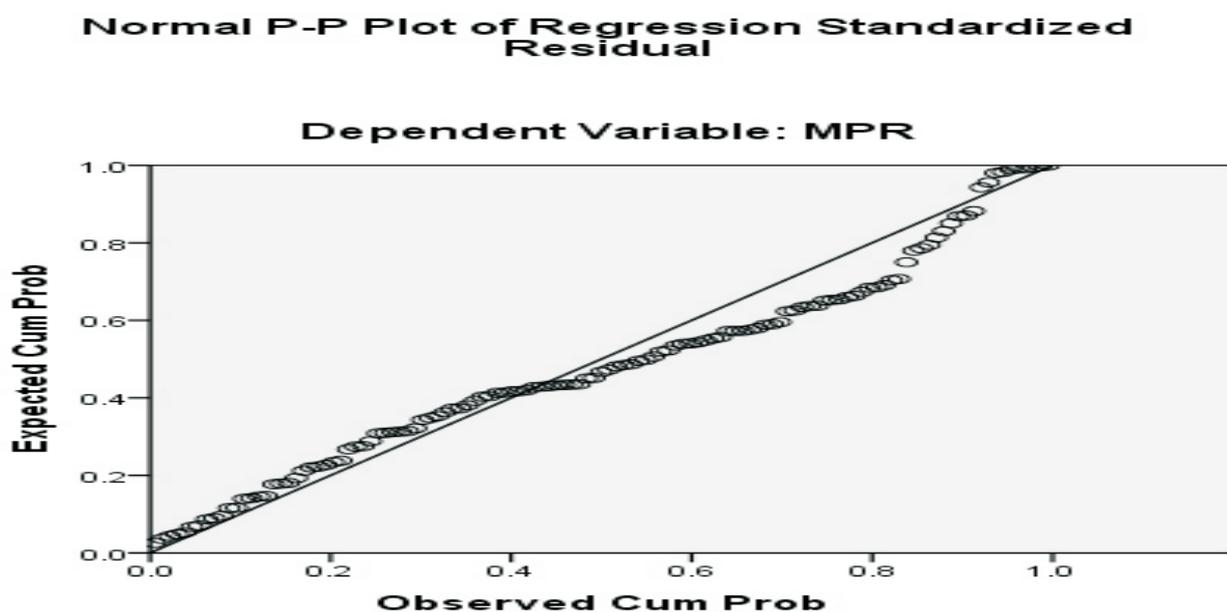
It increased to the highest in the year of 7.23% in April. In the year 2008, the rate in January was 8.58% which increased to 9.21%. The rate fluctuated during the year to the lowest of 6.9% and the highest of 9.21% was in July. In the year 2009, the rate started at 3.88 in January then increased to 5.08% in October.

The rate then fluctuated at between 2.0% and 4.8% for the rest of the year. In 2010, the year started at 3.72%. The year recorded high fluctuations to reach the highest level of 7.58% in November.

The average for the year was 3.88%. In 2011, the year started with a high rate of 7.4%. However, the rates increased tremendously starting the month of February to reach the climax in April at 9.52%.

These details are well illustrated in the figure 4.1 below.

Figure 4.1: 91 – Day Treasury Bill rate



From the graph above, the model of the chart suggest accurate, it indicates a strong correlation between the model's prediction and its actual result.

4.2 Inter-Bank Call Rate

The study also collected monthly data on the Inter-Bank Call rate from the year 2006 to 2016. The year 2006 started at 7.81% in January which dropped slightly to 7.78% in February.

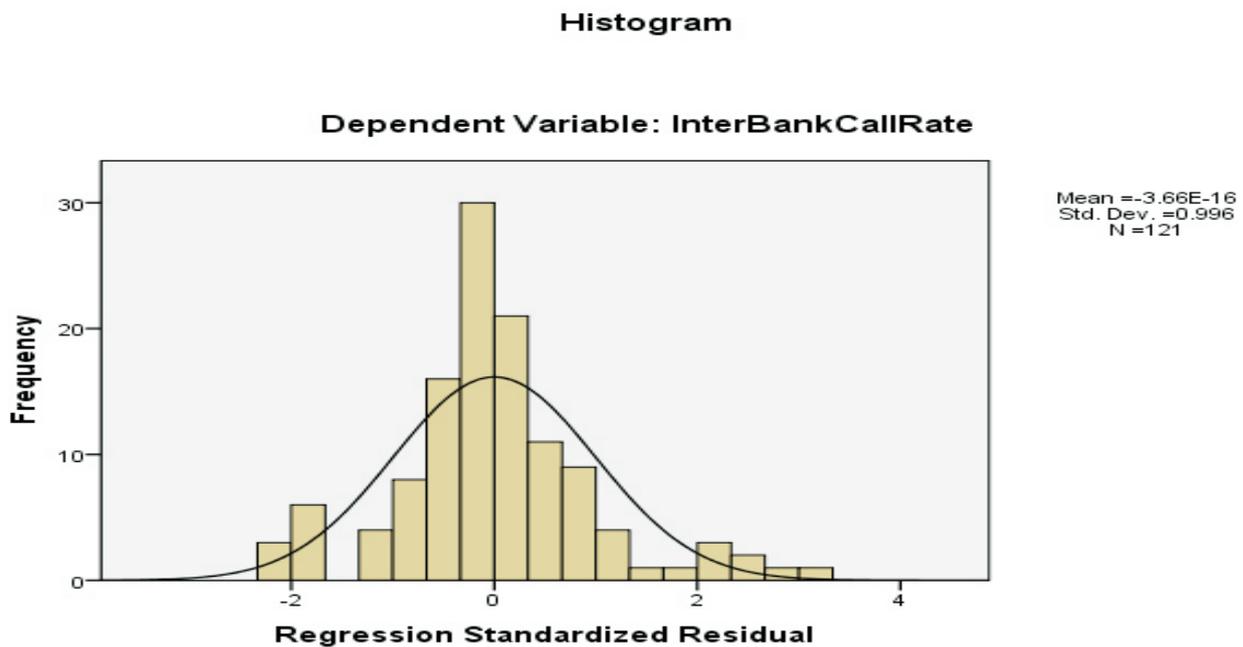
The Inter-Bank Call rate continued with a downward trend to reach an all-time low of 5.73% in July before starting an upward trend to reach 6.34% in December. In 2007, the Inter-Bank Call rate started at 6.43% followed with an increase to 7.81% in September. The Inter-Bank Call rate then started to increase slightly to record 7.13% in December. In 2008, the Inter-Bank Call rate started trading at 7.75%, it then dropped for three

consecutive months to reach 6.67% before increasing to slightly above 7% for three months then declined to 6.06% in September. In 2009, the Inter-Bank Call rate started at 5.10% prevailed for four months in the year with the lowest at 4.05% and the highest at 6.18%.

The year 2010 did not have Inter-Bank Call activities hence there was no Inter-Bank Call rate. The year 2011 also recorded limited Inter-Bank Call activities. The rate in March was 1.66% which increased to reach a high of 18.89% in October before settling at 17.75% in December. In 2015, the rate started with 11.2% in January and continuously declined to 4.57% in December. Similarly, 2016 started on a low rate of 4.12% in January.

These findings are well illustrated in the figure 4.2 below:

Figure 4.2: Inter-Bank Call Rate



From the graph above, the regression standardized residual is normal, hence asymmetrical. This implies that the model is a good fit.

4.3 Monetary Policy Rate

The Monetary policy rate was introduced in Nigeria in December 2006 at 10.0%. The rate was then decreased to 8% in September 2007 which was maintained until June 2007. The MPR remained stable at 10% in the first five months of

the year 2007 before reduction by 2.0% to settle at 8.0% for four months (June and September).

In October the same year, the Monetary Policy Committee raised MPR by 0.5% points to settle at 9.5% which prevailed until November. In 2008, the rate stood at 8.75% which prevailed for the first five months of the year. Starting June, 2008, the MPR rate was adjusted upwards by 0.25% points to settle at 9% until November before being reviewed to 8.5% in December. The year

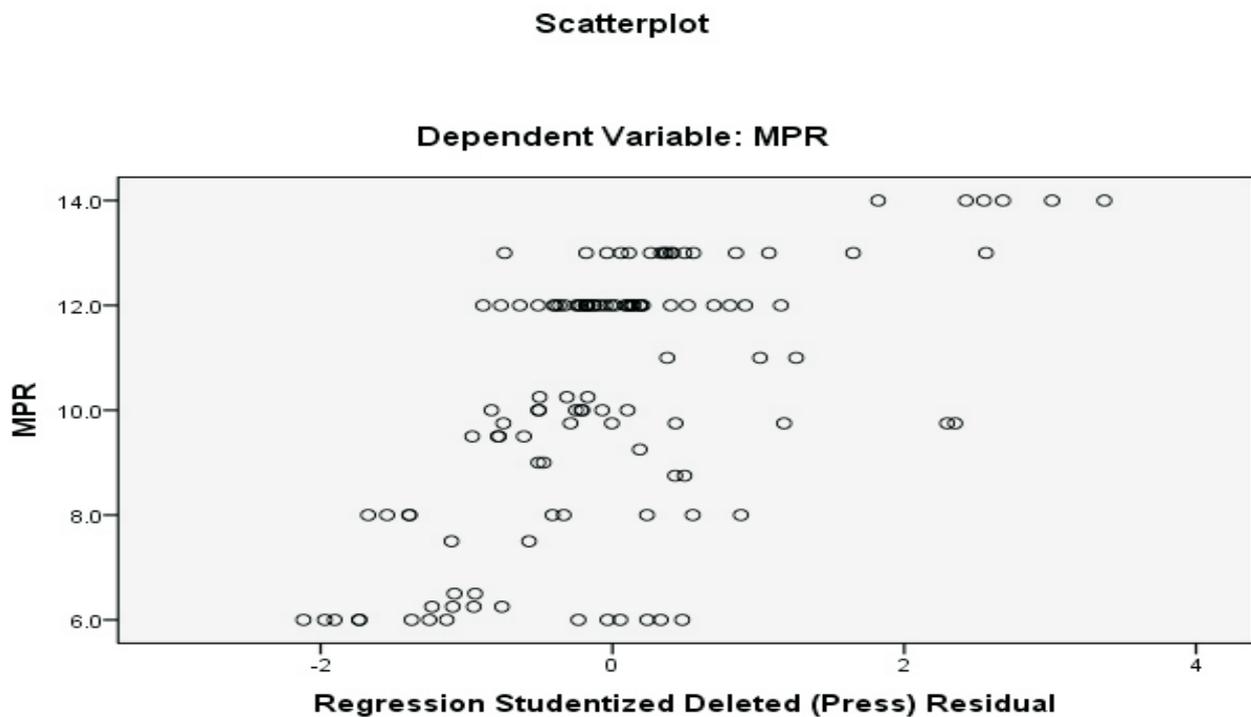
2009, the rate remained the same at 8.5% which prevailed for two months (January and February). The rate then was adjusted downwards by 0.25% points to 8.25%. In June, the rate went down further by another 0.25% points to settle at 8.00%. In August, the MPR was reduced by another 0.25% points to settle at 7.75% as the MPC attempted to stimulate the economy following the adverse effects of global financial crisis in 2008.

This rate prevailed until October when it was cut

by 0.75% points to settle at 7.00% for the month of November and December. In 2010, the MPR opened at 7.00% which was sustained for two months (January and February before being reduced by 0.25% points to settle at 6.75%).

The MPR continued with a downward trend to close at 6.00%. In 2011, the MPR was 5.75% in January and closed the year at 18.00%. The sharp issue in 2011 was in response to a sharp rise in inflation and rapidly depreciating currency.

Figure 4.3: Monetary Policy Rate (MPR)



4.4 Lending rates

The study collected data on the prevailing interest rates for the same eleven year period under review. From the findings, the lending rates started high in the year 2000 at 25.14% increased to 25.39% in February then started dropping in March to 23.44%. The lending rate continued on a downward trend reaching the low of 19.60% in December with an annual average of 22.34%. In 2001, the lending rate started at 20.27% and fluctuated downwards within 19-20.27% giving an annual rate of 19.67%.

In 2002, the lending rates started at 19.30% and continued reducing during the year reaching the

lowest of 18.05% in November. In 2003, the rate continued on its downward trend starting off the year at 19.30% but reducing with more than 5% points to settle at the lowest of 13.47% in December.

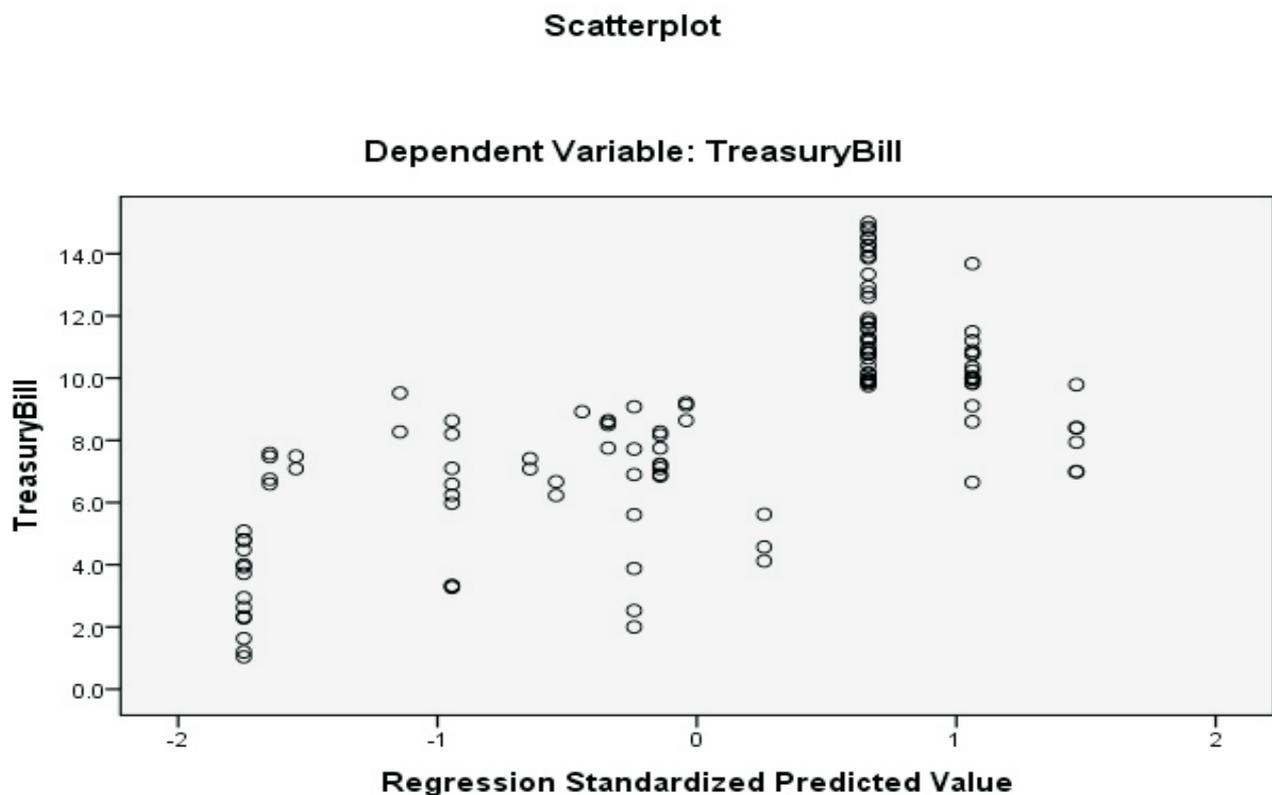
In the year 2004, the lending rates in January was 13.48% and continued with a downward trend to reach an all-time low since the year 2000 to settle at 11.97% in November. In the year 2005, the lending rates opened in January at 12.12% then fluctuated upwards to reach an annual high of 13.12% in April then came down to settle at 13.16% in December. 2006 started a little high at 13.2% which was maintained with minimal

fluctuations during the year.

2007 was similar to 2006 in that the lending rate operated at a few points above 13%. In 2008, the rates started fluctuating upwards starting off the year at 14.98% then easing off towards the end of the year to settle at 14.02%. In the year 2009, the rate remained somehow stable at 14.7% with fluctuations of less than 0.5%. The year 2010 started off at 14.98% then reduced to slightly below 14% towards the end of the year closing at

13.87% in December. The year 2011 started at 14.03% which reduced slightly to trade at between 13.9% and 15.2% up to October. In November, the rate shot up to 18.51% then increased to 20.04% in December. In 2015, the rate started at 16.86% and rose to 17.24% in June and decline to 16.96% in December the same year. January 2016, the rate started at 16.54%. These findings are well illustrated in the table below.

Figure 4.4: Treasury bill Rates



4.5 Descriptive Statistics and Distribution of Variables

Table 4.1 presents descriptive statistics of the independent variables used in estimating the multiple regression model as well as Principal component and Ridge regression models. The statistics covers mean values, standard deviation, and a two-sample t-test statistic to compare the means of Monetary Policy Rate and Interest rates.

The null hypothesis (H_0) in this test is that: “there is no statistical difference between the monetary

policy and Interest Rates”.

It is clear from the table that the Monetary Policy Rate has significant differences in their mean values in terms of some interest rates (Treasure Bill, Saving Deposit, One Month Deposit, Three Month Deposit, Twelve Month Deposit, Prime Lending and Max. Lending) and in term of Inter-Bank Call Rate is not.

More so, it is important to note that simple mean comparison such as the one in this paper is not exhaustive in itself since it provides little information on cause and effects Monetary Policy on Interest Rates.

Table 4.1 profile Analysis of Means and Standard Deviations of Monetary Policy and Interest Rates:

Variables	Monetary Policy Rate Mean =10.35; Std. Dev. = 2.49				
	Mean	Std. Dev.	Mean Diff.	t-value	p-value
Treasury Bill	8.52	3.36	1.829	4.81	0.000
Savings Deposit	2.667	0.810	7.686	32.26	0.000
One Month Deposit	8.66	2.56	1.694	5.22	0.000
Three Month Deposit	9.20	2.37	1.157	3.70	0.000
Twelve Month Deposit	8.19	2.86	2.166	6.28	0.000
Prime Lending	16.84	1.09	-6.491	-26.25	0.000
Max. Lending	22.42	2.97	-12.071	-34.23	0.000
Inter-Bank Call Rate	10.27	5.26	0.084	0.16	0.835

Note: *p-values are meant for testing the null hypothesis that there is no statistical difference between the monetary policy and Interest Rates.*

4.6 CORRELATION ANALYSIS]

Below in Table 4.2 is a Pearson correlation matrix for all the variables used in estimating the models. Correlation analysis is a possible way of assessing the strength of a group of independent variables as against the dependent variable. It also offers a general idea of the inter relationship between the regressors prior to estimation. This in a way provides an overview about possible multicollinearity problems. From the correlation matrix, all the predictor variables recorded their expected signs in relation to Monetary Policy Rate. The Prime Lending interest rate showed a negative expected relationship while the rest of the interest rate (Treasury bill, Savings Deposit, One Month Deposit, Three Months Deposit, Twelve Months Deposit, Max. Lending and Inter-Bank Call Rate) produced positive but expected relationship with the Monetary Policy Rate.

Among these Interest Rates, only the; Treasury Bill, Savings Deposit, Prime Lending, Max Lending, and Inter-Bank Call Rate Interest Rates have statistical significant correlation with Monetary Policy Rate at the 0.05 significance level. To test for the presence of any multicollinearity problem, we used the variance inflation factor (VIF) criterion after estimating a linear regression models. Chatterjee and Price (1991) and Hair et al. (2006) suggest a maximum variance inflation factor (VIF) of 10 for any meaningful and unbiased estimation results. Carrying on with the VIF test, all the variables had VIF values below the maximum criteria except One Month Deposit and Three Months Deposit which recorded very high VIF values above the criteria. As a remedy, Three Months Rate which recorded the highest VIF value was dropped and the test carried out once more.

After eliminating Three Months Rate, it was found that all the regressors had VIF values below the maximum acceptance value.

Table 4.2 Correlation Matrix for Monetary Policy Rate and Interest Rates and Significant of correlation

	MPR	TB	SD	OM D	TMD	TVMD	P L	ML	IBCR	VIF
MPR	1.000									
TB	0.704* 0.000	1.000								2.142
SD	0.232* 0.010	-0.210* 0.000	1.000							1.640
OMD	0.035 0.702	-0.266* 0.003	0.536* 0.000	1.000						28.184
TMD	0.071 0.437	-0.210* 0.021*	0.555* 0.000	0.978* 0.000	1.000					44.203
VMD	0.027 0.771	-0.222* 0.014	0.464* 0.000	0.865* 0.000	0.909* 0.000	1.000				7.420
PL	-0.294* 0.001	-0.456* 0.000	0.160 0.079	0.316* 0.000	0.291* 0.001	0.241* 0.008	1.000			1.744
ML	0.230* 0.011	0.244* 0.007	-0.056 0.539	-0.286* 0.001	-0.269* 0.003	-0.173 0.058	0.188* 0.039	1.000		1.614
IBCR	0.328* 0.000	0.468* 0.000	-0.045 0.621	0.147 0.107	0.181 0.047	0.215 0.018	-0.141 0.123	0.208* 0.022	1.000	1.578

Cell Content: Pearson Correlation; P-value; * denotes significance at 5% α -level; MPR stand for Monetary Policy Rate; TB stand for Treasury Bills; SD stand for Savings Deposit; OMD stand for One Month Deposit; TMD stand for Three Months Deposit; TVMD stand for Twelve Months Deposit; PL stand for Prime Lending; ML stand for Max. Lending; and IBCR stand for Inter-Bank Call Rate

4.7 Estimation Results

4.7.1: Multiple Regressions

In monetary policy rate modeling techniques such as the one employed in this study, predictions and evaluation of models were mainly based only on the function of the significant predictor variables. Therefore, for us to generate a reduced form of the model that contains only the significant variables at a respectable alpha-value, the backward elimination procedure was applied to arrive at the final monetary policy rate model. In this present paper, variables were retained and/or eliminated at the 0.05 significance level.

After seven backward elimination processes, two statistically significant interest rates were retained in the model. The interest rates cover: Treasury bill and Savings Deposit. The result of the regression is summarized in table 3 below.

The interest rates of Treasury bill and Savings

Deposit were found to be statistically significant at the 1 percent α -level with p-values of 0.001 each. The coefficient estimate of the regression model is traditionally interpreted as, a unit increase in interest rate of 91-Day Treasury bill, as result of increase in Monetary Policy Rate in Nigeria by 0.5848 holding all else constant. Furthermore, a unit increases in Inter-Bank Call rate will lead to a -0.035 decrease in the MPR in Nigeria whereas a unit increase in lending rate will lead to -0.128 decrease in the MPR in Nigeria.

From the above analysis of the betas, it can be inferred that 91-Day Treasury bill rate contributes more to the changes recorded in the monetary policy rates in Nigeria followed by Inter-Bank Call rate.

Changes in Monetary policy rate of Central Bank of Nigeria seem to have a somewhat negative relationship with Prime lending rate levels and Inter-Bank Call Rate. However, the relationship to the changes in 91-day Treasury bill rate is positively correlated. At 5% level of significance and 95% level of confidence, 91- Day Treasury bill rate had a 0.000 level of significance; Inter-Bank Call rate had a 0.287 level of significance while lending rates showed a significance of 0.440. From this significance tests, the MPR is more significant on the 91-Day Treasury bill compared

to the Inter-Bank Call rate and Lending rates.

In order to ascertain the fit of the model, the coefficient of Determinant (R-square), Coefficient of variation (C.V), mean square error (MSE), Root mean square error (RMSE) and Ave. Abs pct. Error. A look at the Coefficient of Determinant (R-square), Coefficient of Variation (C.V), mean

square error, Root mean square error, and Ave. Abs. pct Error values in Table 4.3 reveals that the model recorded some values of 0.646, 0.144, 0.223, 1.495 and 11.171 respectively.

From the regression result (i.e. table 4.3), we can state our regression model for monetary policy rate and interest rates from final step (step 7) using backward elimination as follows:

Table 4.3 Estimating Results

Regression Model						
Steps	Variables	Coefficients	Std. Error	t-value	Sig.	VIF
1	(Constant)	2.212	2.614	0.846	0.399	
	Treasury bill	0.604	0.060	10.148	0.000	2.142
	Savings Deposit	1.122	0.216	5.203	0.000	1.640
	One Month Deposit	0.463	0.283	1.634	0.105	28.184
	Three months Deposit	-0.428	0.383	-1.117	0.266	44.203
	Twelve Months Deposit	0.040	0.130	0.307	0.760	7.420
	Prime lending	-0.128	0.165	-0.775	0.440	1.744
	Max. lending	0.095	0.058	1.640	0.108	1.613
	Inter Bank Call Rate	-0.035	0.033	-1.069	0.287	1.568
2	(Constant)	2.232	2.603	0.858	0.393	
	Treasury bill	0.598	0.056	10.720	0.000	1.898
	Savings Deposit	1.109	0.211	5.265	0.000	1.577
	One Month Deposit	0.435	0.267	1.625	0.106	25.271
	Three months Deposit	-0.352	0.290	-1.213	0.228	25.534
	Prime lending	-0.139	0.161	-0.865	0.389	1.663
	Max. lending	0.099	0.056	1.767	0.080	1.506
	Inter-Bank Call Rate	-0.033	0.032	-1.041	0.300	1.550
3	.	.	.	.	.	.
4	.	.	.	.	.	.
5	.	.	.	.	.	.
6	(Constant)	0.993	1.173	0.847	0.399	
	Treasury Bill	0.573	0.043	13.404	0.000	1.109
	Savings Deposit	1.224	0.172	7.117	0.000	1.046
	Max. Lending	0.054	0.047	1.141	0.256	1.064
7	(Constant)	2.106	0.651	3.237	0.002	
	Treasury Bill	0.585	0.042	14.063	0.000	1.046
	Savings Deposit	1.223	0.172	7.102	0.000	1.046
	R-Square (R ²)	0.646				
	Coefficient of Variation	0.144				
	Mean square Error	0.223				
	Root Mean Square Error	1.495				
	Ave. Abs. Error	11.171				

Dependent variable: Monetary Policy Rate (MPR)

4.7.2 Principal Component Regression

The correlations between the independent variables are in the range of -0.456-0.978. Another important test for PCA is the Kaiser-Meyer-Olkin (KMO) of sampling adequacy and Bartlett's test of sphericity. Kaiser (1974)

recommends accepting values greater than 0.5 that means the result for this research is acceptant with the value of KMO is 0.619. Bartlett's test is highly significant ($p < 0.001$) and therefore factor analysis is appropriate for this data.

Table 4.4: KMO Statistics for Sampling Adequate and Bartlett's test for Homogeneity

Test	DF	Approx. Chi-Square	P-value
Keiser-Meyer-Olkin Measure of Sampling Adequate	-	-	.619
Bartlett's Test of Sphericity	28	784.033	0.000

Table 4.5: Total Variance Explained

Comp onent	Initial Eigenvalue			Extraction sums of Squared loadings			Rotation sums of Squared loadings		
	Total	% of varianc e	Cumulat ive %	Total	% of variance	Cumulat ive %	Total	% of varian ce	Cumula tive %
1	3.507	43.835	43.835	3.507	43.835	43.835	3.440	43.000	43.000
2	1.676	20.948	64.783	1.676	20.948	64.783	1.743	21.783	64.783
3	1.205	15.060	79.843	1.205	15.060	79.843	1.205	15.061	79.843
4	0.734	9.174	89.017						
5	0.386	4.823	93.840						
6	0.360	4.505	98.345						
7	0.118	1.481	99.826						
8	0.114	0.174	100.00						

Table 4.5 lists the eigenvalues associated with each linear component (factor) before extraction, after extraction and after rotation. Before extraction, SPSS has identified eight (8) linear components within the data set.

The eigenvalues associated with each factor represent the variance explained by the particular linear component and also displays their eigenvalue in term of the percentage of variance explained (so, factor 1 explains 43.835% of total variance).

PCA extracts all factors with eigenvalues greater than 1, which leaves 2 factors but for this case component 3 has eigenvalue closed to 1, so we consider that component as a factor.

Using 3 factors the percentage variability is about 80%. The eigenvalues associated with these

factors are again displayed in the label extraction sums of squared loading.

The values in this part of the table are the same values before extraction, except that the values for discarded factors are ignored. In the final part of the table the eigenvalues of the factors after rotation are displayed.

Rotation has the effect of optimizing the factor structure and one consequence for these data is that the relative importance of the three factors is equalized.

Before rotation, Factor 1 accounted for considerably more variance than the remaining three (43.835% compared to 20.948% and 15.060%), however after extraction it accounts for only 43.000% of variance compared to 21.783% and 15.061%.

Table 4.6: Rotated Component Matrix

	Component		
	1	2	3
TreasuryBill		0.845	
SavingsDeposit	0.637		
OneMonthDeposit	0.966		
ThreeMonthsDeposit	0.981		
TwelveMonthsDeposit	0.928		
PrimeLending			0.675
Max. Lending			0.843
Inter-BankCallRate		0.825	

Rotated matrix rotation using varimax rotation with Kaiser Normalization is shown in Table 4.6. This matrix contains the loading of each variable onto each factor where values less than 0.4 are suppressed from the output.

The first factor seems to all relate to Deposit interest rates parameters (i.e. Savings Deposit, One Month Deposit, Three Months Deposit, and

Twelve Months deposit).

Therefore, we call the first factor as Deposit interest rates factor. Second factor from 91-Days Treasury bill and Inter-Bank Call Rate, denoted as call rates factor.

The third factor encompasses Prime Lending and Maximum Lending Rate here shall be referred to as factor Lending rate.

Table 4.7 Component Score Coefficient Matrix

	Component			VIF
	1	2	3	
Treasury Bill	-0.025	0.480	-0.047	1.8548
Savings Deposit	0.181	-0.040	0.041	1.5465
One Month Deposit	0.283	0.025	-0.043	3.0260
Three Months Deposit	0.291	0.059	-0.042	0.7082
Twelve Months Deposit	0.278	0.080	-0.001	4.8869
Prime Lending	0.068	-0.268	0.561	1.7129
Max Lending	-0.053	0.157	0.699	1.5737
Inter-Bank Call Rate	0.117	0.496	0.138	1.5748

$$PC1 = -.025Treasury_bill + .181Savings_deposit + .283oneMonthDep. + \dots + .117InterBankCallRa$$

$$PC2 = .480Treasury_bill + (-.040)Savings_deposit + .025oneMonthDep. + \dots + .496InterBankCallR$$

$$PC3 = -.047Treasury_bill + .041Savings_deposit + .283oneMonthDep. + \dots + .138InterBankCallRa$$

The Principal Component Regression (PCR) model was obtained using three main factors from Principal component Analysis (PCA) as independent variables.

Table 4.8 Principal Component (PC) Coefficient section

Principal Component	PC Coefficient	Individual R-Squared	Eigenvalue
PC1	-0.0662	0.0025	3.507
PC2	1.1850	0.3788	1.676
PC3	0.0279	0.0002	1.205

$$MPR = -.0662PC1 + 1.1850PC2 + 0.0279PC3$$

Table 4.9 the result of Principal component Regression coefficient for Monetary Policy Rate in Nigeria

Independent variables	Coefficient of Regression		VIF
	Unstandardized	Standardized	
Intercept	2.0938	0	
Treasury Bill (TB)	0.5726	0.7709	1.8548
Savings Deposit (SD)	1.0477	0.3407	1.5465
One Month Deposit (OMD)	0.0769	0.0790	3.0260
Three Months Deposit (TMD)	0.1201	0.1140	0.7082
Twelve Months Deposit (TMD)	-6.9E-029	4.8869	4.8869
Prime Lending (PL)	-0.1607	-0.0700	1.7129
Max. Lending (ML)	0.1077	0.1285	1.5737
Inter Bank Call Rate (IBCR)	-3.263E-02	-0.0689	1.5748
R-Square	0.6580		
Root Mean square Error	1.5087		
Coefficient variation	0.1457		
Average Absolute Error	1.0537		

$$MPR = 2.0938 + .5726 * TB + 1.0478 * SD + .0768 * OMD + \dots + (-3.263E - 02) * IBCR$$

4.7.3 Ridge Regression Analysis

Ridge Regression is a technique for analyzing multiple regression data that suffer from multicollinearity. When multicollinearity occurs, least squares estimates are unbiased, but their variances are large so they may be far from the true value. By adding a degree of bias to the regression estimates, ridge regression reduces the standard errors. It is hoped that the net effect will be to give estimates that are more reliable. Another biased regression technique, principal

components regression. Ridge regression is the more popular of the two methods.

4.7.3.1 Application of Ridge Regression

To determine the best model fitted the data using ridge regression, firstly we present methods of choosing k .

Table 4.10 below summarizes the results of Ridge Regression of selecting k for Monetary Policy Rate Data.

Table 4.10 the result of Ridge Regression of selecting k for Monetary Policy Rate in Nigeria

Independent variables	Ridge Regression $k = 0.0200$		VIF
	Unstandardized	Standardized	
Intercept	2.5817	0	
Treasury Bill (TB)	0.5663	0.7624	1.7168
Savings Deposit (SD)	1.0521	0.3421	1.4367
One Month Deposit (OMD)	0.2303	0.2363	6.5012
Three Months Deposit (TMD)	-0.1107	-0.1051	7.9095
Twelve Months Deposit (TMD)	-1.7817E-029	-0.0204	4.1130
Prime Lending (PL)	-0.1607	-0.0703	1.5361
Max. Lending (ML)	0.1026	0.1223	1.4140
Inter-Bank Call Rate (IBCR)	-2.785E-02	-0.0588	1.4490
R-Squared	0.6458		
Root Mean Squared Error	1.5353		
Coefficient of Determinant	0.1483		
Average Absolute Error	1.0388		

In ridge trace method we start from $k=0$ and then after taking three values 0.001, 0.002, 0.005 for K , we give the equal space of 0.01. We plot the

regression coefficient against k in figure 1. The system has been stabilized at $k= 0.0200$ is the ridge parameter.

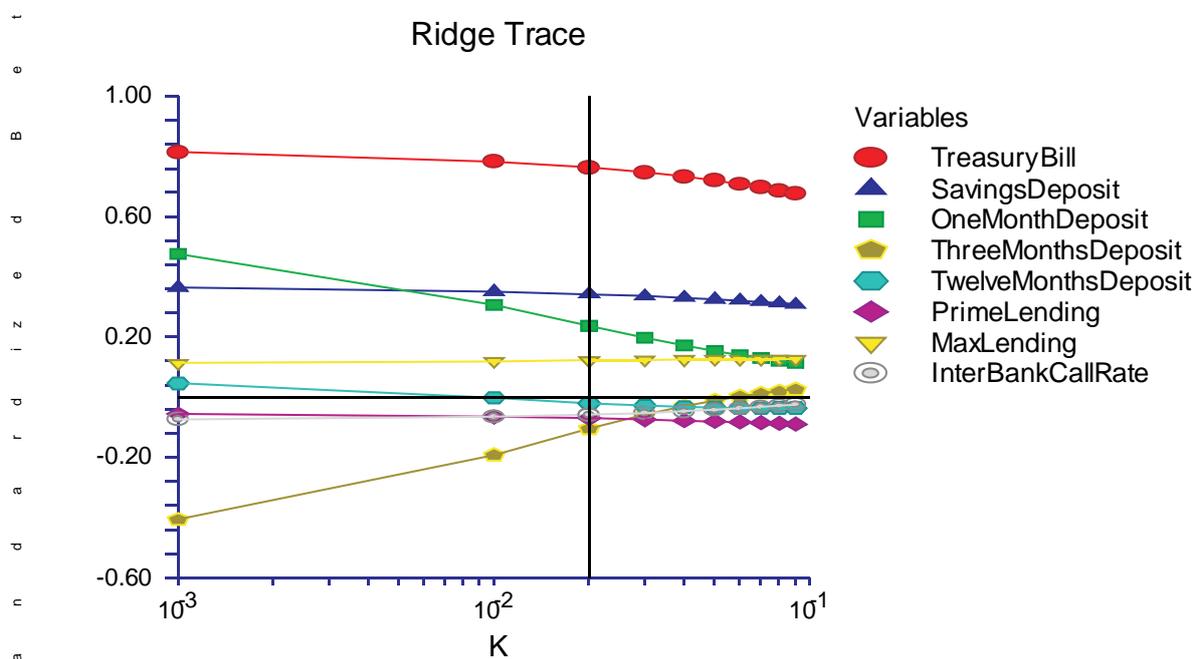


Figure 4.5: The values of the estimated regression coefficients plotted against k with using ridge trace method

From Table 4.10 above, selecting k provided estimated model with significant regression coefficients and high values of determination

$$MPR = 2.5817 + .5663 * TB + 1.052 * SD + .2303 * OMD + \dots + (-2.785E - 02) * IBCR$$

4.8 Comparison Least Squares, Ridge Regression, and Principal Components Regression

From Table 4.11, we see that the Multicollinearity problem between the independent variables for the monetary policy rate model has been solved by using ridge regression RR and principal components regression PCR.

According to Table 4.11, at all three methods the sign of the variables (Prime Lending and Inter-

coefficient. Furthermore, the problem of multicollinearity disappeared in the model because all maximum VIF's were less than 10. Therefore the estimated model of Monetary Policy Rate is:

Bank Call Rate) are found to be contrary to monetary policy rate.

While the parameters of other independent variables (1.e. Treasury bill, Saving Deposit, One Month Deposit, Twelve Months Deposit and Max. lending) for RR and PCR regression methods are compatible with monetary policy rate, and this means that the variables that have significant effect on monetary policy rate are: Treasury bill and Savings deposit.

Table 4.11: the results of OLS, RR, and PCR

Independent variables	Estimated of Parameters		
	OLS	RR	PCR
Treasury bill	0.604	0.566	0.573
t-value	10.148	10.353	10.243
VIF	2.142	1.717	1.855
Savings Deposit	1.122	1.052	1.048
t-value	5.203	5.08	2.709
VIF	1.640	1.436	1.547
One month Deposit	0.463	0.230	0.077
t-value	1.634	1.648	0.821
VIF	28.184	6.501	3.026
Three Months Deposit	-0.428	-0.1107	0.120
t-value	-1.117	-0.665	0.645
VIF	44.203	7.910	0.708
Twelve Months Deposit	0.040	-1.782E-029	-6.9E-029
t-value	0.307	-0.1793	-0.654
VIF	7.420	4.113	4.887
Prime Lending	-0.128	-0.161	-0.161
t-value	-0.775	-1.008	-0.968
VIF	1.744	1.536	1.713
Max. Lending	0.095	0.103	0.108
t-value	1.640	1.869	1.852
VIF	1.613	1.414	1.574
Inter-Bank Call Rate	-0.035	-2.785E-02	-3.263E-02
t-value	-1.069	-0.869	-0.995
VIF	1.568	1.449	1.575
Constant	2.212	2.582	2.094
R-square	0.646	0.645	0.658
Mean Square Error	1.495	1.535	1.509
Coefficient of variation	0.144	0.148	0.146
Ave. Abs. Error	0.112	1.039	1.054

When we compare the results of PCR method with the results of the RR in table 11, we found that RR is better than the PCR, based on the following criteria:

- ❖ The calculated values of the t-test for all parameters according to RR are larger than those calculated using PCR method.
- ❖ Average absolute error in RR is less than PCR method.

On the other hand, the PCR method is considered better than the RR method, according to the following criteria:

- ❖ The value of the coefficient of variation (C.V) of PCR is less than that of RR.

- ❖ The Value of R-square (R^2) in PCR is greater than RR method.

- ❖ The value of the RMSE of PCR is less than of RR method.

5.0 Summary, Conclusion and Recommendations

5.1 Summary of the Findings

The summary is presented on the effect of monetary policy on interest rates. The study concentrated on three variables that have form monetary policies. The monetary policy committee of the Central Bank of Nigeria may use these tools to implement monetary policies so as to be able to regulate the prevailing money in

circulation through regulating interest rates. The lending rates in Nigeria are affected by various factors key among them being the 91-Day Treasury bill Rate which has the highest impact among the three variables studied in this study. This is because the 91-Day Treasury bill Rate provides a stable rate for investors willing to invest in guaranteed investment that promises a good fixed return. As a result, the changes in the 91-day Treasury bill comes with a change in the lending rate as it serves as the bare minimum rate which the banks will be willing to extend their credit.

From the monthly averages for each year, the 91-Day Treasury bill rates fluctuated highly during the study period. It started on a high of 12.73% meaning that the Government wanted to attract more funding for short term projects so it motivated investors to invest in 91-Day Treasury bills hence the high rate. However, the rate slowed down to reach 6.80 in 2007 and then grew slowly to 8.73 in 2011.

A part from the 91-Day Treasury Bills rate, the lending rate in Nigeria is also affected by the Inter-Bank Call rate. The Inter-Bank Call rate determines the rate at which the financial institutions can borrow from one another to meet their short term shortfalls. From the data analyzed, it was established that the annual averages for the study period started at a high of 12.391% then reduced continuously to 2004 to record 2.54% before starting an upward trend. However, a close look at the Inter-Bank Call rate reveals that it moves in the same direction as the 91-Day Treasury bill rate. In the year 2010, there was no activity in the Inter-Bank Call market.

Another variable affecting the lending rates in Nigeria is the central bank rate which is taken as the base lending rate. The Central Bank of Nigeria Monetary policy Committee uses this Rate to check on the Macroeconomic changes in the economy. It uses it to check the inflation among other variables in the economy hence affecting the lending rates.

The central bank rate is mainly used to influence the amount of money in circulation which

therefore means that it has to affect the lending rates as lending directly influences the amount of money in circulation.

5.2 Conclusions

The study concludes that monetary policies affect interest rates. This is because through the monetary policy tools, the monetary policy Committee influences the amount of money in circulation. The study concludes that the 91-day Treasury Bills Rate is the main influencer of the lending rates in Nigeria. This is because it represents the risk free investment for investors. In the second place is the Inter-Bank Call rate.

The Inter-Bank Call also follows the trend that the 91-Day Treasury bill takes because the financial institutions will be borrowing from each other taking into account the prevailing T-bill rates and overnight lending rates represented by the interbank rates.

In summary all the variables (Lending rates, Inter-Bank Call rate, 91-Day Treasury bills rate) considered together were influenced by the monetary policy rate by 64.0%. The study concludes that the MPR influences the 91-Day Treasury Bills rate to the greatest extent followed by the Inter-Bank Call rate. However, the monetary policy rate seems to have a negative relationship with the prevailing interest rates. This could mean that the changes in MPR are not fully felt in the lending rates as it may take some time for investors to free their investments in other investments so as to take advantage of the changes in the interest rates.

Recommendations

In view of the aftermaths of the study, the following recommendations in the use of monetary policy in controlling the prevailing interest rates were made: Before adjusting the prevailing rates in an economy, it is important that the concerned authorities consider the influence of the monetary tool on the money supply and finally the lending rates. The 91-Day Treasury bills rate being the key factor influencing lending rates, a study on the factors that the monetary policy committee considers in arriving at the MPR need to be looked into in order to strengthen its

effectiveness; the 91-Day Treasury bills rate influences the lending rates by the greatest margin than all the other variables (Lending and Inter-Bank Call rate) thus suggesting that the 91-Day Treasury bills rate is key to influencing the monetary policy rate.

A study to determine appropriate mix of 91-Day treasury bills rate, Inter-Bank Call rate and the lending rate that can influence the MPR effectively needs to be carried out since all the

variables considered together influence the lending rate by 64.0% which is relatively low. An assessment to establish the other factors greatly influencing the lending rates would be relevant.

Similarly, since the MPR is not statistically significant in influencing the lending rates then a further study on the whether the MPR need to be retained as a determinant of the lending rates need to be undertaken as well.

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IMPERATIVES OF FISCAL DISCIPLINE IN SUSTAINING ECONOMIC GROWTH



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1.0 INTRODUCTION

The Nigerian economy technically exited a recession since the second half of 2017 but the growth in GDP has remained weak and fragile. The National Bureau of Statistics (NBS) report for the first quarter of 2018 reveals that although the real Gross Domestic Product grew by 1.95 per cent in Q1 2018, it actually declined when compared with the output growth of 2.11 per cent in the previous quarter.

The recession was brought about in the first instance by the continuous decline in crude oil prices from mid-2014, which led to a drastic fall in government revenue given the Nigeria's over reliance on crude oil revenue. Indeed, the economic shock from the collapse in international crude oil price would have been less severe had the country observed fiscal discipline during periods of boom.

Fiscal discipline can be defined as the capacity of a government to maintain smooth financial operations and long-term fiscal health. It is essential to improve and sustain economic performance, maintain macroeconomic stability, and reduce vulnerabilities. Strong fiscal discipline builds up financial management capacity which contributes to good governance.

The concept of fiscal discipline can be viewed

from three perspectives. The first is by public finance theorist, Richard Musgrave who explained it to mean financing of current operations from current revenue, implying that a government should cover its current expenditures only with current revenues. According to Musgrave and Musgrave (1989), deficits can bring current benefits to residents and win political support for officials but add tax burden on future tax payers.

Another view by John Mikesell (cited in Musgrave and Musgrave, 1989), is that fiscal discipline is exercised if government agencies execute the appropriations Act faithfully by spending approved amounts of money on legislatively intended items or purposes. The third usage by Axelrod extends the coverage of fiscal discipline to legislators, which requires that the legislature should act to meet its own deadlines and targets on resolutions, budget and appropriation bills. The remaining sections of this paper examine why fiscal discipline is essential for Nigeria, experiences of peer countries and imperatives of fiscal discipline for sustaining economic growth.

1.1 WHY FISCAL DISCIPLINE IS CRUCIAL FOR NIGERIA

Rising oil prices, higher oil output, new foreign exchange measures (Investors & Exporters window), tight monetary policy and interventions by the Central Bank of Nigeria (CBN) in Agriculture have contributed immensely to achieving stability in the foreign exchange market, declining inflation, improvement in capital inflows, increased foreign exchange reserves and positive developments in the capital market. However, all these factors have not positively impacted enough to boost non-oil revenue, reduce inflation within the CBN's target range of between 6–9 per cent or reduced unemployment.

Fiscal imbalance is also widening. According to the International Monetary Fund (IMF, 2018), "high fiscal deficit is crowding out the private sector. The provisional Federal Government (FG) overall fiscal deficit for 2017 (4.3 percent of GDP) is 50.0 per cent higher than what was recorded in

2016" Tax to GDP ratio is low at 6.0 per cent while debt service ratio is becoming unsustainable. Concessional loans from multilateral sources are dwindling and becoming difficult to secure. Foreign commercial credits (Eurobonds) which the country has resorted to have considerable risks.

The structure of the Nigerian economy is still defective. Although the size of the oil sector in the country's economy is on the decline, it has continued to account for a disproportionate share of government revenue. Data from the NBS show that crude oil accounts for about 90.0 per cent of

foreign exchange earnings. Consequently, the fate of Nigeria's economy is still tied to the fortunes of the international crude oil market-rising with a rise in crude oil price and falling with a dip in oil price.

As indicated in Table 1, the country's macroeconomic performance in recent times confirms this pattern as the major indicators fared better between 2011 and 2015, a period characterised by relative high oil price. The last two years have witnessed relatively poor economic performance mainly due to relatively low oil prices.

Table 1: Selected Macroeconomic indicators : 2011 – 2017

	2011	2012	2013	2014	2015	2016	2017
GDP (%)	4.4	4.3	5.4	6.3	2.7	-1.54	0.8
Inflation (%)	10.8	12.2	8.5	8	9.0	17.6	15
Exchange rate (US\$)	162.3	156.2	160	183	199.1	305	305
MPR (%)	12	12	12	13	11	14	14
Foreign reserves	32.9	44.2	43.6	34.5	29.1	24.5	33
External Debt/GDP (%)	1.4	1.5	1.8	1.8	2.2	2.6	3.5
Debt/GDP ratio (%)	10.2	10.4	10.5	10.5	na	11.5	18

Sources: CBN, NBS, DMO

The negative effect of the country's defective economic structure is pronounced in unmet budget targets. In recent times in particular, shortfalls in projected government revenue have

accounted for the poor implementation of annual budgets especially the capital component (see Table 2).

Table 2: FGN Revenue Performance, January, 2017– July, 2017

		2017 Approved Budget (N Billions)	Pro Rata (Jan-June) (N Billions)	Actual (Jan-June) (N Billions)	Variance (N)
S/N	FEDERAL RETAINED REVENUES	5,084.40	2,542.20	2,429.65	-112.55
A	FGN 48.5% Share of:	3,503.08	1,751.54	1,313.75	-437.80

1	Oil Revenue	2,122.18	1,061.09	960.87	-100.22
2	Minerals & Mining Revenue	1.06	0.53	-	-0.53
3	Non-Oil Revenue	1,379.84	689.92	352.88	-337.04
i	CIT	807.82	403.91	157.38	-246.53
ii	VAT	241.92	120.96	62.54	-58.42
iii	Customs Revenue	277.56	138.78	132.97	-5.81

Sources: OAGF, Budget Office

Table 2 clearly shows a significant adverse variance in oil revenue projections for 2017.. In this regard, it is evident that the Nigerian economy is highly vulnerable to shocks. According to Fitch, Nigeria requires an oil price of about US\$139 a barrel to balance its budget.

An oil-exporting country's "fiscal breakeven" oil price is the minimum price per barrel that the country needs in order to meet its expected spending needs while balancing its budget. Oil prices below this level will result in budget deficits unless government policies change.

In its 2017 report on 14 major oil exporting nations in the Middle East, Africa and emerging Europe, Fitch says only Kuwait, Qatar, Congo and UAE have estimated break-evens that are below US\$60 per barrel. It is therefore not surprising that the Federal Government has increased borrowing to finance its budget deficits. According to data from the Debt Management Office (DMO), Nigeria's total public debt stock at end December 2017 was N21.7 trillion,(table 3).

Table 3: Nigeria's Public Debt Stock as at December 31, 2017 in N'Millions

Debt Category	Amount Outstanding in USD	Amount Outstanding in NGN
A. External Debt Stock (FGN + States)	18,913.44	5,787,512.64
Domestic Debt Stock (FGN Only)	41,142.11	12,589,486.13
Sub-Total	60,055.55	18,376,998.77
B. Domestic Debt of States	10,943.71	3,348,774.26
C. Grand-Total (A+B)	70,999.26	21,725,773.03

Source: DMO

Although the country's public debt stock, representing about 18.0 per cent of nominal GDP, remains within acceptable debt thresholds since it is well below the World Bank's debt sustainability threshold of 56.0 per cent for Nigeria and other peer countries, rising debt

service payment relative to revenues is a source of concern as it places a squeeze on government's ability to fund its expenditure programmes.

As noted by the IMF, "the FG interest payments-to-FG revenue ratio rose to 63.0 per cent at end-

Table 4 indicates that owing to the decline in government revenues, the debt service payment is significant relative to total expenditure.

Of greater concern is the contribution of domestic debt service payments to the debt service ratio as

domestic debt service constitutes about 90.0 per cent of total debt service.

Table 4: FGN Expenditure Performance January, 2017 - July, 2017

		2017 Approved Budget (₦'Billions)	Pro Rata (Jan-June) (₦'Billions)	Actual (Jan- June) (₦'Billions)	Variance (₦'Billions)
S/N	FGN EXPENDITURE	7,441.18	3,720.59	3,101.33	-619.26
A	Statutory Transfer	434.41	217.21	209.02	-8.19
B	Recurrent Expenditure	4,832.27	2,416.13	2,892.31	476.18
1	Non-Debt Recurrent Expenditure	2,990.92	1,495.46	1,947.57	452.11
2	Debt Service	1,841.35	920.67	927.74	-7.07
i	Domestic Debt	1,488.00	744.00	871.94	-127.94
ii	Foreign Debt	175.88	87.94	55.80	-32.14
iii	Sinking Fund	177.46	88.73	-	-88.73
3	Others	-	-	17.00	
C	Capital Expenditure	2,174.50	1,087.25	-	1,087.25

Sources: OAGF, Budget Office

Table 4, also reveals that about N1.00 trillion should have been expended as at June, 2017 out of the N2.174 trillion allocated to capital in the 2017 budget but not a single kobo had been spent by the end of June 2017. While the late passage of the 2017 budget was partly responsible, the shortfall in projected oil revenue contributed to the problem. This is happening in a country with huge infrastructure gap.

Nigeria was ranked 132 out of 138 countries in overall quality of infrastructure in the 2016 Global Competitiveness Report. Low tax revenues are

keeping the fiscal deficit high, leading to more government borrowing that is crowding out the private sector activity amid high unemployment rate.

Although relative macroeconomic stability has been achieved attributable to rising oil prices and higher output as well as effective monetary policy and strategic interventions by the Central Bank of Nigeria, the economic situation remains challenging. Recovery after recession is still fragile, weak and uneven as critical sectors are still in the negative territory as indicated in Table 5.

Table 5: Performance of leading sectors in 2017

Activity Sectors	Contribution to GDP (Per cent)	GDP (Per cent)
Agriculture	25.08	3.45%
Trade	16.86	(1.05)
Information and Communication	11.35	(1.04)
Manufacturing	9.18	(0.21)
Mining and Quarrying	8.81	4.72
Real Estate	6.85	(4.27)
Construction	3.72	1.00
Professional, Scientific and Technical	3.69	(0.26)
Financial and Insurance	3.00	1.26
Public Administration	2.28	(0.38)

Sources: NBS and FSDH Research

According to the IMF, the population is growing at about 3.0 per cent annually, with youth (0 to 19 years of age) accounting for more than 54.0 per cent of the population. Demographic trends imply that Nigeria could be the third most populous country in the world by 2050. This could present a significant challenge to per capita growth and poverty reduction.

According to the 2018 IMF Article IV Consultation Report on Nigeria:

“State and local governments balance sheets remain fragile. Backlogs in the payment of salaries, debt to contractors, slow progress in generating internal revenue (despite ongoing efforts to improve tax administration and inflows from Ministries Departments and Agencies) and 11.0 percent of Paris Club refunds outstanding, are weighing on the reform environment. The Budget Support Facility, intended to run out in May 2017, has continued to transfer N700 million per month per state (N126 billion between June and October 2017), even though

some states have not met the associated conditions for disbursements set out in the 22 points Fiscal Sustainability Plan”.

So despite the country's exit from recession, vulnerabilities remain, providing a strong case for the enthronement of fiscal discipline at all levels of government in Nigeria.

1.2 FISCAL DISCIPLINE: EVIDENCE FROM PEER COUNTRIES

Nigeria is often grouped among the MINT countries. MINT is an acronym for Mexico, Indonesia, Nigeria and Turkey. These countries undertook reforms at one point or the other to strengthen fiscal discipline.

Mexico Intensified a two-year austerity drive in its 2017 budget trimming the headline fiscal deficit from 3.0 per cent of GDP in 2016 to 2.4 per cent of GDP in 2017. The government focused on cutting spending rather than increasing debt or taxes-from slashing government operating costs by about one fifth. It also implemented diversification of public revenues and increasing the tax base in order to reduce dependence on oil

revenues, strengthened the tax administration system to combat evasion, enhanced efficiency in tax collection as well as carried out reforms in public expenditure to incorporate a performance-based perspective to allow for a more efficient allocation of resources.

Indonesia made use of carefully planned conditional cash transfer programmes geared towards job creation and equal distribution across regions, enacted a tax amnesty law in 2016 which offered citizens a nine-month window in which to declare previously unreported assets and pay a low tax rate. This was meant to widen the tax base and boost government revenues. It is instructive to note that Indonesia has a population of over 255 million people. Before the tax amnesty only 27 million registered as tax payers while less than 1 million paid income tax. On her own part, Turkey halved the ratio of public debt to GDP from almost 80.0 per cent in 2001 to less than 40.0 per cent before the global crisis of 2008. Improved management of public debt led to longer maturity periods and lower interest rates. Prudent applications were made with proceeds from sale of government assets and privatization to repay sovereign debt. As noted in the country's Medium Term Program introduced in 2017, the budget deficit/GDP ratio is targeted at 1.9 per cent in 2018, 1.8 per cent in 2019, and 1.6 per cent in 2020

2.0 IMPERATIVES OF FISCAL DISCIPLINE FOR NIGERIA

The imperatives of fiscal discipline in sustaining economic growth in Nigeria are examined from two perspectives: what the government has done and what it can still do. Interestingly, the Fiscal Responsibility Act of 2007 contains key provisions designed to promote fiscal discipline in Nigeria. Key provisions in this regard include:

- a) Time Limit for presentation of Medium-Term Expenditure Framework in which the Minister is required before the end of the second quarter of each financial year to present the Medium-Term Expenditure Framework to the Federal Executive Council for consideration and endorsement;

- b) Where the reference commodity (oil) price rises above the predetermined level, the resulting excess proceeds are expected to be saved. The saving of each Government in the Federation shall be deposited in a separate account which shall form part of the respective Governments Consolidated Revenue Fund to be maintained at the Central Bank of Nigeria by each Government. The CBN, in consultation with the Minister of Finance, the State Commissioners of Finance, and Local Government Treasurers, shall invest, for and on behalf of the Governments in the Federation, the saving of each Government and such investment can be undertaken in a consolidated manner, provided that, the shares of each Government and income due to them from the investment are clearly identified. No Government in the federation shall have access to the savings made unless the reference commodity price falls below the predetermined level for a period of three consecutive months;
- c) According to Section 36 of the FRA 2007, the creation, expansion or improvement in government action which result in an expenditure increase shall be accompanied by an estimate of the budgetary or financial impact in the year it becomes effective and in the two subsequent years and statement by the person requesting for the expenditure stating that the increase is consistent with the Appropriation Act and the Medium-Term Expenditure Framework;
- d) Government at all tiers shall only borrow for capital expenditure and human development, provided that, such borrowing shall be on concessional terms with low interest rate and with a reasonable long amortisation period subject to the approval of the appropriate legislative body where necessary, (S.41). In addition, government shall ensure that the level of public debt as a proportion of

national income is held at a sustainable level as prescribed by the National Assembly from time to time on the advice of the Minister;..

- e) The President shall with advice from the Minister of Finance subject to approval of National Assembly, set overall limits for the amounts of consolidated debt of all tiers of government. The limits and conditions approved by the National Assembly, shall be consistent with the fiscal policy objectives in the Medium term fiscal Framework, (S. 42); and
- f) Any Government in the Federation or its agencies and corporations desirous of borrowing shall, specify the purpose for which the borrowing is intended and present a cost-benefit analysis, detailing the economic and social benefits of the purpose for which the intended borrowing is to be applied,(S. 44). Each borrowing shall ensure the existence of prior authorisation in the Appropriation or other Act or Law for the purpose for which the borrowing is to be utilised and that the proceeds of such borrowing shall solely be applied towards long-term capital expenditures.

2.1 What the Government has done

- a) Implementation of some Public Financial Reforms involving Treasury Single Account, the Efficiency Unit and Payroll Clean Up-Integrated Payroll and Personnel Information System;
- b) Establishment of Debt Management Office in some states;
- c) Tax Amnesty (VAIDS) to ramp up non-oil revenue helped by the BVN; and
- d) Strategy of replacing existing T-bills with Eurobonds in view of the high cost of domestic debts.

2.2 What the Government can still do

- a) Strict compliance with FRA 2007. This will

among other benefits curb state governments' penchant for bank borrowings;

- b) There is still room to cut recurrent spending (beam searchlight on Ministries that consume the bulk of recurrent expenditure notably Interior, Education, Defense and Health);
- c) Revisit the report of the Presidential Committee on reform of government agencies. The Committee chaired by Mr. Steve Oronsaye had observed that the average cost of governance in Nigeria ranks among the highest in the world and recommended the reduction of statutory agencies of government from 263 to 161;
- d) Use Executive order to streamline purchases made by MDAs. Leverage economies of scale from collective demand processes;
- e) Utilise more of infrastructure bonds (eg sukuk);
- f) Clearly identify and sell unproductive government assets. The proposed relocation of Ikoyi and Kirikiri prisons in Lagos are good initiatives;
- g) The National Assembly should enact the "Buy Nigerian Act" which promotes the use of locally made products (similar to The Buy American Act that helped the US exit economic recession in the 1930's) to complement the President's Executive Order;
- h) Tweak some sintervention programmes, especially the conditional cash transfer scheme to gear them towards productivity;
- i) Plan for fiscal tightening in 2018 ahead of elections in 2019;
- j) To achieve overall increase in tax to GDP ratio from 6.0 per cent to 15.0 per cent

focus on consumption (indirect) taxes. Increase collection efficiency. Reduce direct taxes to stimulate production and employment. Personal and company taxes can be reduced while VAT can be raised, as part of moves to increase competitiveness and rebalance the economy towards exports and savings;

Show greater commit to the implementation of the ERGP. Fiscal Discipline demands that annual budgets should properly connect with government's medium term plan (ERGP). Recently Bill Gates observed that allocations to Education and Health do not reflect ERGP key objectives.

There is need to increase capital allocations to key sectors such as agriculture, education and health in order to align with the key ERGP objectives. Timely release of funds is essential to achieve greater performance of the budget.

The overarching goal of Nigeria's growth strategy beyond recession exit should be to achieve high, sustainable and inclusive economic growth. With the economy still susceptible to the vagaries in the crude oil market, economic growth will remain fragile and anemic. A number of reforms have been undertaken by the government to promote fiscal discipline but more can still be done to strengthen the efficiency of public financial management. There is therefore the need to apply fiscal discipline in the budgetary process to limit recurrent expenditures in particular within currently available resources and to guarantee timely adoption of a realistic budget to guide government operations in any fiscal year. Sound budgetary practices must be accompanied by mechanisms devised to cushion the effects of oil price shocks as well as other exogenous factors beyond the control of government. To this end the build-up of a fiscal buffer and the adoption of budgets before the start of each fiscal year are necessary conditions for fiscal discipline.

3. CONCLUSION

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