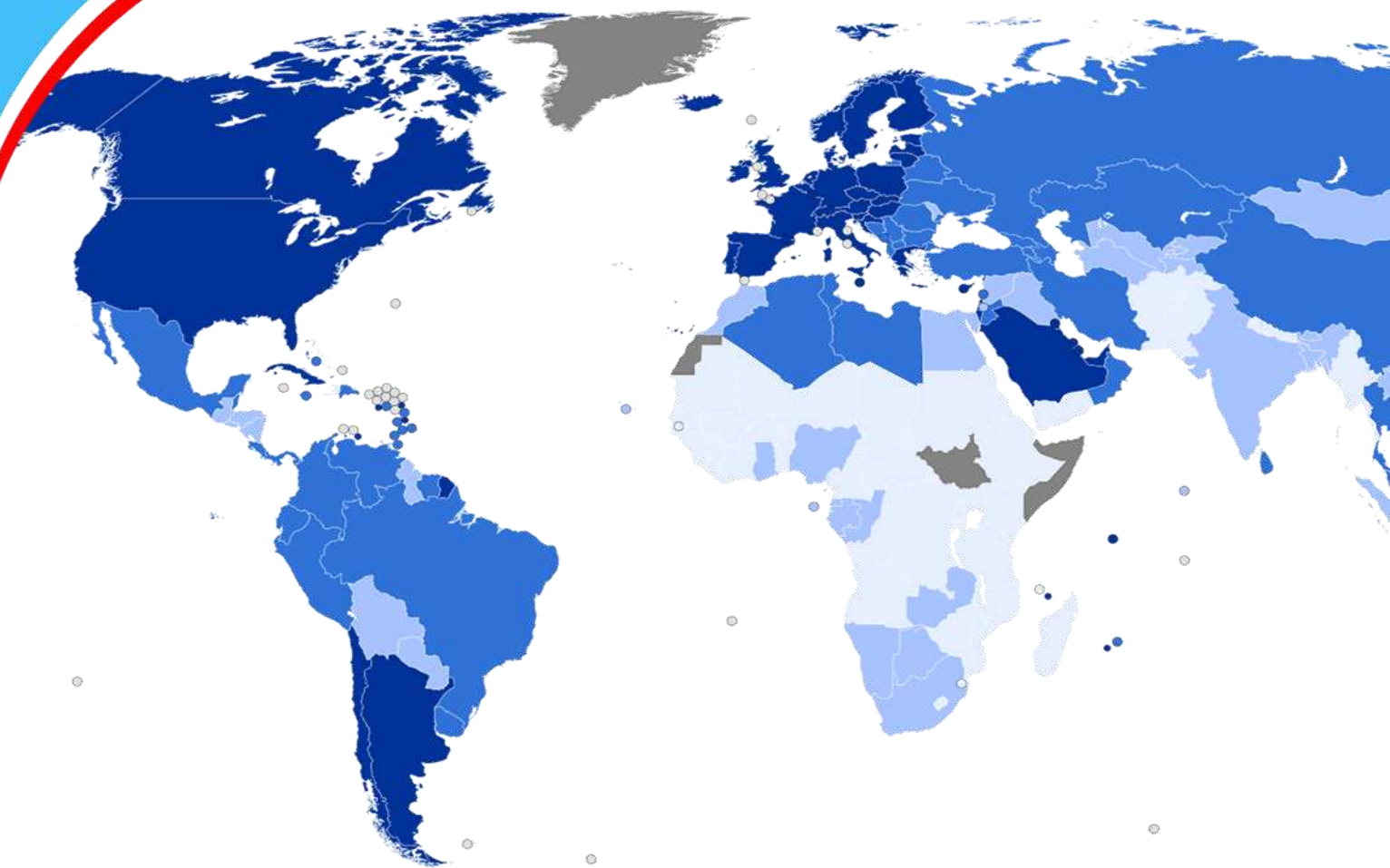


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empirical appraisal

Tonprebofa Waikumo Okotori
Dr. Eze Gbalam PhD



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Tonprebofa Waikumo Okotori

Department of Banking & Finance, Faculty of Management Sciences. Niger Delta University,
Wilberforce Island, Bayelsa State.
+2348066590952

Email: tonprebofa@gmail.com

ORCID ID: <https://orcid.org/0000-002-4114-6052>

Dr. Eze Gbalam PhD

Head of Department of the Department of Banking and Finance, Niger Delta University,
Wilberforce Island, Bayelsa State-Nigeria.
+2348036248431

Email: geps@yahoo.com

ABSTRACT

Purpose: This paper investigated the impact of the CBN's intervention in the private sector as reflected in such interventions impact on the gross domestic product of the country.

Methodology: The econometric methodology adopted in this study is the error correction methodology (ECM), it tested the short-run dynamics of the estimated model. The long-run test utilized was the Johansson cointegration test on the gross domestic product (GDP) as the dependent variable and inflation, credit to the private sector and the exchange rate as the explanatory variables. The data (secondary) was sourced from the CBN statistical bulletin and the banks website

Findings: Findings from the study show that credit to the private sector had a positive, but insignificant impact on GDP at the 5 and 10 per cent level of significance. The prime lending rate that was used as a proxy for interest rate showed a negative but insignificant impact as was the exchange rate even at the 10 per cent level of significance. However the inflation rate had a negative, but significant impact on the gross domestic product. The increase in private sector credit administration through the various interventionist programmes of the CBN may not have translated into increased GDP growth for the period under study. Inflation was not moderated as was expected, in line with some previous research findings that were an allusion to the consequence of sub-optimality and the resultant perplexity. The CBN needs to reassess the impact of its numerous interventionist programmes to see how they can have effective traction on the economy as anticipated and adopt essential approach for Nigeria with a post oil economy in view.

Keywords: *GDP, Cointegration, ECM, Private sector credit, sub-optimality.*

JEL: E02, E58, E61,

1.0 Introduction

1.1 Background of the study

Central banks all over the world are basically saddled with the responsibility of ensuring not only price stability, but macroeconomic stability of a country's economy. These bankers' of last resort have forayed increasingly into direct intervention in the entire economy of any given country. Quantitative easing in advanced economies and other similar policies in the economies of emerging market countries have made central bankers to become dominant in the control of the economies in their respective countries, though at a varying degree in country specific terms. In Nigeria, the scope of supervisory management of the banks and the financial system as a whole has also widened and now incorporates the bank's participation in microfinance institutions and even cooperatives and other village based credit providing institutions and platforms. The monetary authority in Nigeria (CBN) has intervened in agriculture, microfinance, foreign exchange markets etc. The goals of these interventions seem to be targeted at increasing the national output, stabilize inflation and spur growth in the financial markets. There is the need to know if these policy measures had the desired effect and impact as well as to whether the anticipated goals were achieved. Twinoburyo and Odhiambo (2017) surveyed existing literature on monetary policy impact on growth and came away with the conclusion that monetary policy matters for growth; whether in the long or short-run in the presence of a nexus that is seem to be rather ambiguous.

Emefiele (2015(a) & (b)) noted that it was no longer news that the CBN has, for many years gotten into a direct or indirect involvement in the finance of programmes that were considered to enhance growth and supports the federal governments developmental projects. These involvements' seem to be incidental to the bank's core mandates and part of its development and corporate social responsibilities, to accelerate growth and further expand the development of the Nigeria's economy. In this regard, the Bank's interventionist initiatives encompass real sector programmes as well as agriculture, small and medium scale enterprises, infrastructural development and youth empowerment. There is a broad spectrum of policy initiatives whose implementation might generate contradictory results; such as sub optimality as consequences might also lead to the failure to achieve basic policy goals in terms mild inflation and sustained growth. The main issue that arrests a keen observers' interest is the fact that the effect of credit purveyance, may produce sub-optimal consequences in addition to ineffective resource allocation when the conditions are not acceptable; producing a big stock of unpaid loans (Amoo et al, 2017). This aforementioned perplexity is the core concern of our study. Amoo et al (2017) noted further that based on the existence of the many credit interventions undertaken by the CBN and the financial institutions influenced by it; there is a reasonable doubt as regards the Nigeria economy's absorptive capacity.

The economic landscape of Nigeria is filled with missed and unfulfilled policy goals and targets, be they at the macro level, industries and policy impact on individual firms' growth as well as productivity. Thus we need to take a look at the impact of the CBN's several interventions on the performance of key variables in order to ascertain if there is recorded success or failure of the CBN's policies. The common denominator to all these CBN policies is the desire to grow the

private sector of the Nigeria economy. The extant literature(s) have been explicit about the fact central bank policies have both a significant direct as well as immediate effect on financial markets (Sharma, Mahendru & Srivastava, 2019).

There are certain questions that these interventions tend to generate and these express inherent problems in the economy; has the central banks' forays into the markets for foreign exchange in an attempt to stabilize inflation, increased output? Has the CBN's introduction of policies as regards sourcing of foreign exchange reduced the pressure on the naira despite falling revenues? Did the CBN's increased funding to the private sector increase the effect of such GDP growth?

1.2 Research hypotheses

The following research hypotheses were tested in this research;

H₁ The CBN's policy intervention has no significant impact on the GDP?

H₂ The GDP/inflation nexus via the CBN's policy implementation is not significant?

1.0 Review of related literature

The era that preceded the great financial crises' of 2007-2009 had an established consensus as regards what was an ideal model of a typical central bank. The focus then had evolved around price stability, inflation targeting as well as correcting macroeconomic fluctuations in the economy and independence from political control or manipulation (Balls, Howat, and Stansbury, 2018). Smith (2019) did observe concerning the economy of Argentina, that investors and analysts alike were losing faith that Argentina's policymakers had a clear plan to control the effect of uncontrollable volatility that has engulfed the country's financial assets of recent, as the central bank introduces a fourth change in six weeks to its currency intervention rules.

Finance and economics literature is replete with evidence as regards the understanding that the independence of the monetary authority contributes effectively to its macroeconomic stabilization efforts; inflation control and maximization of output growth with flourishing financial markets. The outcome from these policy prescriptions had been contradictory to established theoretical position; with fiscal policy expansions as well as an interventionist and far less restrictive monetary authority actions. This had been due to the helplessness of traditional approaches that failed miserably at the inception of the great financial crises of 2007-2008.

2.1 Theoretical review

2.1.1 Theory of Financial liberalization

Financial sector liberalization is a theory that focused on the implementation of a given number of reforms on the operation of the financial system and policies that are made to deregulate and improve the financial system and the existing functional structures so as to produce a market that is liberalized; existing in a regulatory framework that can be considered appropriate (Bayoumi, 1993). The theory of financial liberalization by Shaw (1973) and McKinnon (1973) was on the belief that a higher real rate of interest, will lead to greater degree of financial deepening. This will consequently increase saving, and that financial savings that will become available is

allocated and invested more efficiently. The foregoing is the opposite of savings invested directly in the sector in which it takes place, without financial intermediation (Thirlwall, 2005). The process of liberalization of the Nigeria financial system took off in 1986; a product of SAP (Structural Adjustment Programme). The Nigeria economy is a product of reforms and is experiencing continuous liberalization as well as being a work in progress as regards need for further liberalization.

2.1.2 Distributive role of central bank policy

Researchers such as de Haan and Eijffinger (2016) observed that the last global financial market crisis of 2007/2008 has altered the perceived role of central banks and that this can be seen in massive use of new unconventional monetary and macro-prudential policy measures; though financial stability and unconventional policy moves of the monetary authority have a much more impactful distributional consequences than conventional monetary policies as well as potential implications for the independence of the central bank. It can be seen that Central banks' policies may have serious impact on workers and capitalists, debtors and creditors, finance and industry etc. The discretionary monetary policy enables the central banks' to control inflation by monetary policy tools. Hence, the various policy measures by the CBN have had that allocative touch in a distributive form.

Jones and Matthijs (2019) posited that the monetary authority's since the last downturn seem to be involved in carrying out policy decisions that are purely based on political considerations and because of their limited distributive consequences; these include the use of unconventional monetary policy instruments in order to resuscitate financial firms as well. The Central banks' all over the world are involved in frantic attempts at influencing the economy towards their anticipated path via monetary policy. Consequently, such efforts take a distributive pathway or pattern.

2.1.3 Political role of central banks

Contemporary analysts' assess the central banks political role; as to whether the bank is independent or not and how its policy stance on macroeconomic stabilization is independent of the executive. It is observed that of late, central banks that reflect as well as promote similar interest, with certain constituencies and positions both in the public and private; impact on the nature of the whole political discuss about economic policy (Epstein, 1982). The IMF and other external players have focussed on promoting financial liberalization, inflation targeting and the elimination of capital controls. The same cannot be said of central banks' that are more integrated into government as they will follow policies and procedures that are in tandem with what the government has recommended. This negates the policy bedrock of an independent central bank as required by apriori expectation.

Shastri (2019) did opine that central banks (especially in Asia) should not be subject to political pressures or be a tool in the hand of politicians: which is precisely what seems to be occurring in the Philippines and India. The resultant effects may not seem to be as favourable as anticipated. India's monetary authority (RBI) can be counted as one of India's most important institutions: assessed to be in the same league of repute as the Indian electoral commission or the military as

regards public trust on competence of institutions. He opined further that when central banks are tainted with politics; this will concern financial markets and confuse the public.

2.1.4 The allocative role

The policies of Central banks' can have an impact that might be deliberate or otherwise influence the ability of various sectors of the economy to access credit and this enhances growth as well as profitability of firms in the economy. There is little recognition of the allocative role of central banks' in impacting on development and sustainable growth. The monetary authority in Nigeria has vigorously pursued this role with various interventionist programmes in almost all sectors of the economy. This seems to be the main thrust of the neo-liberal version of central banking in many developed and emerging market economies all over the world.

Emefiele (2016) did observe that the challenge for governments is how to channel state resources into projects and programmes that make the greatest contribution to the actualization of long-term growth and development objectives. Emefiele(2016) further opined that such projects include roads, railways, transportation, hospital, schools, power, etc. which are components of critical infrastructure that is of both social and economic nature. The economy of Nigeria can be classified as still developing; hence the present situation of the country's economy supports the urgency required for policies that will turn it around and this has led to focus and direct participation by governmental agencies such as the central bank in the quest to produce critical infrastructure to enhance growth and development.

2.2 Central bank as an agent of development

The developmental role of Central banks sets up the bank as an effective engine of real growth and development and that term refers to the role of it being an agent that promotes growth. Central banks' as agents of development evolve around the basic concept of macroeconomic stabilization alongside its core functions in the economy. The CBN had used various instruments in an attempt to meet multiple objectives. The Bank has used both quantitative measures and exchange rate adjustment in response to foreign exchange scarcity following the fall in oil price since 2014. Some of the measures include restrictions on commercial banks' FX trading, closing of the official auction window for foreign exchange, and stopped providing foreign exchange for 41 items by removing them from the official window. In September 2015, J.P. Morgan excluded domestic bonds in Nigeria from its naira denominated government bond because of foreign exchange liquidity issues. In an attempt to rejuvenate the slowing economy, the CBN increased the number of its interventionist programmes and at the same time carry out an accommodating policy on via its monetary policy rate and the cash reserve ratios that was introduced in November 2014 and May 2015 (IMF, 2016a).

The CBN practically sacrificed its core goals of controlling inflation and ensuring price stability to achieving increased liquidity and output growth, and exchange rate stability for cash flows within its monetary policy trilemma (Oshikoya, 2016). Olaitan (2016) opined that in the existence of limited fiscal space, the monetary authority has a definitive role in promoting sustainable economic development noting that the mandate focussed on promoting sustainable economic development and price stability also applies to the CBN.

Emefiele(2014) in his maiden speech as CBN Governor stated that he envisaged the CBN transforming into a well-articulated body whose policies and programmes will be geared towards facilitating job creation, reducing high treasury bills rates, increasing access to MSMEs credit facilities, improving the CBN'S Agricultural Sector interventionist programmes, developing the payment system that facilitates financial inclusion; while still not dispensing with the core concerns of exchange rate stability, financial system stability and as well as a strong external reserve base. There have been heightened interests in the Bank's interventions over the past few years from the stakeholders on whether the developmental objective of the CBN conflicts with the stability objective.

The foregoing introduces the policy perplexity that this study tend to analyze as the effort at macroeconomic stability and output maximization might introduce a cocktail of unintended consequences that in the long run might be detrimental to sustained growth in output and economic stability. The growth of the economies of East Asia, particularly Japan, Korea and China also strengthened the view that central banks can facilitate the attainment of certain developmental goals, by directly supporting or subsidizing lending to priority sectors. The Japanese central bank supported credit allocation policies in furtherance of the government's industrial policy. There is consensus that central banks', particularly in developing economies have to develop policies not only to address price stability, but also to have a major role in the political, institutional, and economic environment. It was on this premise that the Governor of the CBN in his maiden speech, noted that the Bank would pursue the stability of price and the financial system ; including the provision of assistance through functioning as an agent of development through the establishment of an enabling environment that will lead to Nigerians having a better standard of living and that these will include policies to enhance the ability of Nigerians to have a better access to more credit as well as mitigate the high cost of borrowing (Emefiele, 2014).

The twin focus of these programmes was to increase growth via the weaknesses observed in the private sector; by improving the country's financial system. Monetary policy now reflects the imperative that the trajectory for growth of the economy is maintained, in addition to the determination that the lending rate is not subject to increased upward pressures. The interventions now gave the monetary authority power to give "direct support" to industries that have high job-creating capacity and other vital economic infrastructure such as power projects. The list of the CBN's interventionist programmes are as follows;

1. Commercial Agriculture Credit Scheme (CACs)
2. Real Sector Support Facility(RSSF)
3. SME Credit Guarantee Scheme (SMECGS)
4. SME Re-structuring and Refinancing Fund (SMERRF)
5. Nigeria Electricity Market Stabilization Fund (NEMSF)
6. Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL)
7. Power and Airline Intervention Fund (PAIF)
8. Anchor Borrowers Programme (ABN)
9. Nigeria Textile Intervention Fund (NTIF)
10. Non-Oil Export Stimulation Facility

11. Youth Innovative Entrepreneurship Development Programme (YIEDP)
12. Export Credit Rediscovery and Refinancing Facility (ECRRF)

The CBN has also implemented various foreign exchange policy measures in addition to the afore mentioned interventionist schemes and the goal mainly was output growth maximisation as well as keeping inflation within the 6-9% threshold. But Amsden (2001) had observed that the major weakness of development banks was not that they spent on the wrong industries, but that, in some cases, they spent too much overall. The conclusions of Epstein (2009) were mixed as they were neither solely positive nor negative.

2.3 Empirical literature review

The study by Mohamed et al (2010) investigated the theoretical postulations on the central bank's intervention policies' efficiency within the recent financial downturn. The study evaluated the policy efficiency of these interventions in the short-run for the UK and the US as well as in France; as regards their financial markets via econometric methodology. The SVAR model was adopted in, deriving the impulse response functions to ascertain how stock markets respond to central bank policy shocks. Based on the anticipated asymmetric and non linear reactions, the study also used a two-regime STR-GARCH model to determine the extent of intricacies and non linear reactions of the capital markets to shocks introduced by the monetary authority's policy shocks. As expected, the results indicate very significant response from the rate of interest shocks on movements in the stock markets; this shows that there is need for investors to keep a keen interest the interventionist policies of the monetary authorities' when making decisions on investment.

But the research by Agu (2011) specified basically models that reflected the monetary policy reaction functions for Nigeria; (1) this model reflected the process of the use of the monetary authority's toolkit (CBN), and (2) the second model was based on the Taylor rule. The findings indicate that inflation and credit to the private sector are primary in the CBN's monetary policy reaction function as revealed in finance literature. The study concluded that it was thus necessary to state that the monetary authority in Nigeria has not deviated from mitigating the negative impact of out of control inflation spike and achieving the objective of growth that is driven by the private sector. The bank still condoned the missing of its goals and objectives, though not deliberately, yet following the Taylor rule. These findings clearly introduce the perplexity element to the outcome of the CBN's policy measures.

Yoshino et al.(2014) investigated the responsiveness the prices of stock in Asia to the monetary authority's external shocks using a VAR model. In this research there was an attempt to find out how monetary policy impacts prices of stocks in the stock market via three channels; these are money supply, the rate of exchange, and inflation. But the results show that increases in stock prices are persistently due to the impact shocks from monetary policy. Variance decomposition result indicate that, after 10 periods, the forecast error variance of above 53 per cent of the Iranian stock market index (TEPIX) is based on shocks to the exchange rate of the US dollar-Iranian rial, but for the Iranian rial to GDP; it was only 17 per cent. They argued that such evidence can be accounted for by an endogenous response of the stock prices to the monetary policy shocks.

Okafor et al.(2016) examined the link connecting (deposit money banks) DMB's credit and GDP in Nigeria for the period that spanned 1981-2014. The variable utilize for this VAR analysis were RGDP, PSC and broad money(M2) and these were passed through some preliminary tests, while a validity test of serial correlation was also conducted on the residuals of the variables. The findings show the causal link was rather unidirectional and this flowed from private sector credit and the supply of money(MS) to GDP as proxied by real gross domestic product (RGDP), but no feedback was observed from RGDP to either of the two independent variables (PSC or M2).

Amoo et al (2017) determined the combination of domestic conditions and environmental affects on the absorptive capacity of credit in the Nigerian economy for data sourced from 1993 to 2013 by the adoption of MLS methodology. Results from the study indicate that credit impacts positively on GDP; a scenario that still thrives when the trade openness, monetary policy, investment climate and infrastructure impact is low. The adopted composite local index indicates that GDP is enhanced by private sector credit; based on the fact that the ability of the local economy to absorb credit to grow GDP was 29 per cent in 2013. These results suggest that there is ample room for growth enhancing credit expansion in Nigeria.

Khobai et al. (2017) explored on how to add to the increasing information on the impact that South African FDI had on its the per capita GDP growth. Time series data was collected between 1970 and 2016. In an attempt to differ from most of the previous works on this area of research, the study used quantile regressions which focussed on the effect of FDI on GDP at different distributional quantiles. The surprising results from the study was that FDI impact negatively ion welfare when the quantiles at an extremely low level, though at other levels the impact is insignificant. In contrast, welfare is affected positively by domestic investment and this relationship is significant. In summary, the findings, give policymakers something serious to consider when determining the when, where and how of policy intervention in South Africa. The study by Nguyen (2017) adopted data from 45 studies conducted between 2001 and 2014. The study employed a regression analysis that is referred to as meta-regression analysis (MRA) to build up vector-autoregressive methodology. The findings reveal that when there is monetary policy tightening; output is affected in about 32 countries that were made up of developing as well as emerging market countries. The outcomes of the study seem to show publication bias. But the conclusion was that; tight monetary policy had a negative impact on output.

Srithilat and Sun (2017) did study the impact of the monetary authority's policy moves on the economic development of the country by adopting time series data from 1989-2016. Stationarity test, shows stationarity at first difference for all the variables, followed by the Johansen Cointegration and error correction model to determine the association between the variables employed. The results reveal that the supply of money, the rate of interest rate and the rate of inflation all impact negatively in the long-run on the real GDP per capita and only the exchange rate in real terms shows a sign that is positive. The ECM shows that between the supply of money, real rate of exchange and the GDP on per capita basis there exist a short-run causality. Inflation within a country specific threshold is growth inducing and that stabilization indicates the effectiveness of the monetary authorities policies.

Edward (2018) investigated the dynamic connection of domestic investment, local funding for the private sector and GDP (economic growth proxy variable) in Nigeria. The data set was collected on an annual basis from 1970 to 2015. The Vector Autoregressive (VAR) model and its accessories of impulse response functions (IRFs) and variance decomposition composition (VDC) were applied to analyze the annual data. A series of tests were done and the resultant findings show that the link that connects GDP and domestic credit to the private sector is positive and insignificant. The findings from this study show that increase in PLR leads to a drop in output though this was not statistically significant. There was also a positive but insignificant link between PDI and output. The study further discovered the presence of a negative nexus connecting the rate of exchange and private domestic investment, indicating that when there is a spike in the real exchange rate; this reduces domestic private investment.

Awad and Al karaki (2019) analyzed the effect of bank lending on output in Palestine. The study adopted an ADF to test for stationarity, cointegration (Johansen) test, VAR and the VECM to find the long and short-run dynamics of the variables in addition to the granger causality test. The results show that a long-run nexus exists between the variables, but the short-run dynamics was insignificant. The causality was rather unidirectional from economic growth to bank lending. The summary conclusion was that bank lending had no causative influence on GDP; rather economic growth causes bank lending.

Begum and Aziz (2019) investigated the effect of credit that is domestically provided to the private sector by local banks on real GDP in Bangladesh. The data utilized was time series that spanned 1983-2017. The stationarity test reveals that the variables were first difference stationary and that there was no cointegration in the model, hence the adoption of the VAR methodology. The findings of this study showed there was a statistically negative but significant (10 per cent) nexus as regards country wide funds made available to private sector, but that there exist an insignificant link that connects public credit and real GDP.

The study by Famoroti and Tipoy (2019) investigated the effect of the monetary authority's toolkit on GDP for about 14 countries in the ECOWAS sub continent. Quarterly data that spanned 1980(1) to 2017(4) was utilized and Panel Structural Vector Autoregressive (SVAR) model for the study was used to analyze the econometric data. The findings show that shocks that are external have significant effect on output growth and stability of ECOWAS. Money supply was found to have influence on the growth in output, the rate of inflation and the rate of interest. The implications from the results were that the monetary authority's toolkit was significant in impacting on GDP growth in addition to other stabilization policies in the sub-region. Money seems to be the basic denominator of the Central banks' interventions. The interventions by the Central banks' did impact on growth.

2.0 Methodology

3.1 Study design

The ex post facto research design was utilized for this study, based on the fact that the investigation is being done after the occurrence of the events considered. The study as defined by

the design can also be seen as a comparative research, to Ezeaku et al.(2018) it is an attempt to know the causality linking the independent variables to the dependent variable.

3.2 Population of the study

This study was an attempt to show the causal nexus that links all the variables that were considered; this being the focus of the study. The data population consisted of times series that was of a secondary nature; hence it was not of a primary nature.

3.3 Sample

The annualized time series data was collected for GDP (dependent variable), and regressors; credit to the private sector (CRDT), interest rate (INT), the rate of inflation (INF) and the rate of exchange (EXR).

3.4 Sources of data

Data was sourced from statistical bulletins of the Central Bank of Nigeria (CBN) for various years, covering the period 2009-2019.

3.5 Model development and variable description

The study adopts the ECM econometric methodology, the one test to determine a long term nexus will be Johansen cointegration approach. The stated fact is the assumption that all the variables in the model are integrated at first difference. The speed at which the model is restored to equilibrium in the long run is established via the ECM; this shows the rate at which the disequilibrium in a prior period returns to equilibrium on a monthly basis.

3.5.1 Gross domestic product (GDP)

The gross domestic product describes the total value of finished goods and services that are produced by any given country over a relevant period of time. The GDP of any country is an economic measure of productive capability of that country. CBN's interventionist policies were targeted at increasing the GDP of the country over the period under study. This is seen as the dependent variable in this research.

3.5.2 Real lending rate (INT)

The variable referred to as the real interest rate describes that interest rate that a lender investor or saver expects to get after the rate of inflation is deducted from the proxy for nominal anchor (PLR). The value of the real interest rate can attract savers to save more and this increases the availability of investment that creates growth as considered in finance literature (Drobyshevsky et al., 2017; Shaikat et al., 2019).

3.5.3 Exchange rate (EXR)

The rate of exchange measures the intrinsic value of a country's domestic currency in relation to other currencies. In Nigeria the CBN is the main regulator of the market that dealt with foreign exchange (Obadan, 2012). The monetary had operated exchange rate regime that can be described as managed until 2020 when it decided to go for a free float regime. Hence the CBN had used the exchange rate as a monetary policy tool before 2020. There are studies that have considered this nexus (Alom, 2015; Ahmad et al., 2016; Katusiime et al., 2016; Ono, 2017; Musa et al., 2019).

3.5.4 Inflation rate (INF)

Inflation is due to a persistent rise of the average price level in relation to goods and services. In Nigeria the CBN targets an inflation threshold of 6 to 9 per cent as being conducive for growth stimulation. The rate of inflation thus impacts on Growth for the Nigeria economy. The effect of the rate of inflation on growth has been considered by several studies (Nasir & Saima, 2010; Ayyoub, 2016; Mothuti & Phiri, 2018).

3.5.5 Private sector credit/GDP (CRDT)

The private sector credit refers to the amount financial resources made available to private sector by financial intermediaries and even the monetary authority via interventions that were either direct or indirect. The variable adopted for this research is the ratio of private sector credit made available in relation to the county's GDP. This variable describes the impact of this variable to GDP growth. The nexus between this variable and inflation has been considered by many researchers, yet the CBN's intervention seem anchored on the impact this variable has on growth (Osman, 2014; Marshal et al., 2015; Olowofeso et al., 2015; Osisanwo, 2017; Imoagwu & Ezeanyej, 2019).

3.6 Model specification

Our model targets the description the effect on output exerted by the monetary authorities policy transmission channel. In order to show this effectively, there is estimation for the economy of Nigeria the linear regression equation:

$$Y_t = \beta_0 + \beta_1 CRDT + \beta_2 INT_t + \beta_3 EXR + \beta_4 INF + \mu_t \dots \dots \dots (1)$$

3.6 Method of data analysis

In this study Y represents output (derived as generated monthly percentage contribution of the all sectors to GDP via E views), *CRDT* is the credit channel that reflects the amount of funds that directed to the private sector to boost growth, *INT* represents the interest rate channel (when the inflation rate is deducted from the nominal anchor (the rate of interest), we have the real rate of interest), and *EXR* represents the exchange rate channel and *INF* which is the rate of inflation.

Equation one is adopted as the model reflecting the monetary authority’s policy impact on GDP growth as a baseline model. Ezeaku et al. (2018) posited that after the long-run link is established, there is need to integrate a model that incorporates the short-run dynamics process of adjustment; this ECM is the rate of speed at which every in the short-run is restored to equilibrium in the long-run. From the foregoing, they developed the ECM by modifying the above equation as follows:

$$\Delta Y_{tj} = \beta_0 + \sum_{i=1}^n \beta_{1i,j} \Delta Y_{t-1,j} + \sum_{i=0}^n \beta_{2i,j} \Delta CRDT_{t-1,j} + \sum_{i=0}^n \beta_{3i,j} \Delta INT_{t-1,j} + \sum_{i=0}^n \beta_{4i,j} \Delta EXR_{t-1,j} + \Delta INF_{t-1} + \mu_t \dots \dots \dots (2)$$

Where Δ refers to change; i and j are the length of the lags ; number of lags is represented by n ; δ_{t-1} represents the error correction term (ECT) (the rate of adjustment), which is integrated at Order 0, 1(0); β_0 represents the constant term; β_1 – β_6 are coefficients; and μ_t is the error term.

The Johansen cointegration was employed to test for the cointegrating relationship among the variables given the fact that all our series are stationary after first differencing (i.e., at Order 1).

4.0 Data presentation, analysis and discussion of findings

There are several sub areas in this section and it covers; analysis conducted as well as the display of the derived results. There is a presentation of the findings of; the unit root test, cointegration test in order to ascertain if there exists a long run nexus between the variables using the Johansen multivariate co-integration test as was proposed. The analysis continues with an analysis of the coefficients that were estimated to show the short-run dynamics through the use of the ECM.

4.1 Data presentation and analysis

Descriptive Statistics

	GDP	CRDT	INT	INF	EXR
Mean	14313893	16977834	11.35561	12.65174	211.6135
Median	94144.96	17081045	12.00000	12.80000	158.8400
Maximum	69799942	26694527	14.64000	18.70000	371.8200
Minimum	54612.26	8226443	0.230000	8.000000	121.3600
Std. Dev.	26474313	5268944	2.838096	2.914426	77.99711
Skewness	1.520655	-0.110361	-0.864535	0.140770	0.775327
Kurtosis	3.461376	1.786319	3.272036	2.219531	2.022803
Jargue-bera	52.04340	8.369566	16.85030	3.786183	18.47692
Probability	0.000000	0.015226	0.000219	0.150605	0.000097
Sum	1.89E+09	2.24+09	1498.940	1670.030	27932.98
Sum Sq. Dev.	9.18E+16	3.64E+15	1058.178	1112.698	79694.00
Observations	132	132	132	132	132

4.1.1 Unit Root Tests

Null Hypothesis: GDP has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.660717	0.4488
Test critical values: 1% level	-3.480818	
5% level	-2.883579	
10% level	-2.578601	

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

Null Hypothesis: D(GDP) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-11.31776	0.0000
Test critical values: 1% level	-3.481217	
5% level	-2.883753	
10% level	-2.578694	

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

Null Hypothesis: CRDT has a unit root
 Exogenous: Constant
 Lag Length: 12 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.771600	0.8231
Test critical values: 1% level	-3.486064	
5% level	-2.885863	
10% level	-2.579818	

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

Null Hypothesis: D(CRDT) has a unit root
 Exogenous: Constant
 Lag Length: 11 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.757497	0.0044
Test critical values: 1% level	-3.486064	
5% level	-2.885863	
10% level	-2.579818	

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

Null Hypothesis: INT has a unit root
 Exogenous: Constant
 Lag Length: 2 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.563518	0.4983
Test critical values: 1% level	-3.481623	
5% level	-2.883930	
10% level	-2.578788	

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

Null Hypothesis: D(INT) has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-11.61455	0.0000
Test critical values: 1% level	-3.481623	
5% level	-2.883930	
10% level	-2.578788	

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

Null Hypothesis: INF has a unit root
 Exogenous: Constant
 Lag Length: 3 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.059018	0.2617
Test critical values: 1% level	-3.482035	
5% level	-2.884109	
10% level	-2.578884	

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

Null Hypothesis: D(INF) has a unit root
 Exogenous: Constant
 Lag Length: 2 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.960990	0.0022
Test critical values: 1% level	-3.482035	
5% level	-2.884109	
10% level	-2.578884	

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

Null Hypothesis: EXR has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	0.303229	0.9777
Test critical values: 1% level	-3.481217	
5% level	-2.883753	
10% level	-2.578694	

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

Null Hypothesis: D(EXR) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-17.70856	0.0000
Test critical values: 1% level	-3.481217	
5% level	-2.883753	
10% level	-2.578694	

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

4.1.2 Co-integration Test

Date: 04/08/20 Time: 16:14
 Sample (adjusted): 2009M05 2019M12
 Included observations: 128 after adjustments
 Trend assumption: Linear deterministic trend
 Series: GDP CRDT INT INF EXR
 Lags interval (in first differences): 1 to 3

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.274854	71.59849	69.81889	0.0358
At most 1	0.152499	30.46150	47.85613	0.6951
At most 2	0.042175	9.282252	29.79707	0.9890
At most 3	0.028998	3.766659	15.49471	0.9214
At most 4	8.19E-09	1.05E-06	3.841466	0.9996

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.274854	41.13699	33.87687	0.0057
At most 1	0.152499	21.17925	27.58434	0.2655
At most 2	0.042175	5.515593	21.13162	0.9907
At most 3	0.028998	3.766658	14.26460	0.8831

At most 4 8.19E-09 1.05E-06 3.841466 0.9996

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by $b'S11*b=I$):

GDP	CRDT	INT	INF	EXR
3.65E-08	-6.82E-07	0.368199	-0.608415	0.034806
2.92E-08	3.55E-07	-0.681316	-0.220796	-0.005291
-4.90E-08	-4.92E-08	0.029816	-0.188005	0.016487
-1.80E-08	-1.27E-07	-0.297642	0.143130	0.013483
-1.34E-08	-1.22E-07	-0.021350	-0.072541	0.025768

Unrestricted Adjustment Coefficients (alpha):

D(GDP)	-1370042.	-1831990.	920283.0	387496.9	-60.04947
D(CRDT)	276217.6	-110475.4	18780.53	22849.94	71.51266
D(INT)	-0.197044	0.291649	0.047451	0.110367	2.99E-05
D(INF)	0.015873	0.033223	0.090790	-0.030943	-5.67E-06
D(EXR)	-3.626682	-0.377964	-0.548699	-0.874401	0.000478

1 CointegratingLog
Equation(s): likelihood -4897.106

Normalized cointegrating coefficients (standard error in parentheses)

GDP	CRDT	INT	INF	EXR
1.000000	-18.67283 (3.29947)	10079856 (3502483)	-16656050 (2645048)	952859.6 (204242.)

Adjustment coefficients (standard error in parentheses)

D(GDP)	-0.050045 (0.02516)
D(CRDT)	0.010090 (0.00335)
D(INT)	-7.20E-09 (3.9E-09)
D(INF)	5.80E-10 (1.7E-09)
D(EXR)	-1.32E-07 (3.4E-08)

2		CointegratingLog		
Equation(s):		likelihood	-4886.516	
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	CRDT	INT	INF	EXR
1.000000	0.000000	-10153266 (2897970)	-11135903 (2428485)	265554.2 (129881.)
0.000000	1.000000	-1083560. (166854.)	295624.6 (139823.)	-36807.78 (7478.07)
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.103621 (0.03119)	0.284597 (0.51239)		
D(CRDT)	0.006859 (0.00426)	-0.227594 (0.07000)		
D(INT)	1.33E-09 (4.8E-09)	2.38E-07 (7.9E-08)		
D(INF)	1.55E-09 (2.2E-09)	9.59E-10 (3.6E-08)		
D(EXR)	-1.44E-07 (4.4E-08)	2.34E-06 (7.2E-07)		

3		CointegratingLog		
Equation(s):		likelihood	-4883.758	
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	CRDT	INT	INF	EXR
1.000000	0.000000	0.000000	2878629. (4098333)	-274111.2 (155430.)
0.000000	1.000000	0.000000	1791260. (472325.)	-94401.05 (17913.0)
0.000000	0.000000	1.000000	1.380298 (0.46139)	-0.053152 (0.01750)
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.148689 (0.04475)	0.239290 (0.50901)	771155.4 (512065.)	
D(CRDT)	0.005939 (0.00617)	-0.228519 (0.07013)	177531.5 (70550.6)	
D(INT)	-9.92E-10 (6.9E-09)	2.36E-07 (7.9E-08)	-0.269842 (0.07907)	
D(INF)	-2.89E-09 (3.1E-09)	-3.51E-09 (3.5E-08)	-0.014084 (0.03535)	
D(EXR)	-1.17E-07	2.37E-06	-1.094187	

	(6.3E-08)	(7.2E-07)	(0.72293)	
4	CointegratingLog			
Equation(s):	likelihood	-4881.875		
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	CRDT	INT	INF	EXR
1.000000	0.000000	0.000000	0.000000	-207601.4 (97863.1)
0.000000	1.000000	0.000000	0.000000	-53014.50 (16353.0)
0.000000	0.000000	1.000000	0.000000	-0.021261 (0.01252)
0.000000	0.000000	0.000000	1.000000	-0.023105 (0.01279)
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.155664 (0.04623)	0.190134 (0.51506)	655820.0 (547679.)	1120495. (454541.)
D(CRDT)	0.005528 (0.00638)	-0.231417 (0.07105)	170730.4 (75553.1)	-143922.7 (62704.7)
D(INT)	-2.98E-09 (7.1E-09)	2.22E-07 (7.9E-08)	-0.302692 (0.08426)	0.062365 (0.06993)
D(INF)	-2.34E-09 (3.2E-09)	4.14E-10 (3.6E-08)	-0.004874 (0.03779)	-0.038491 (0.03136)
D(EXR)	-1.01E-07 (6.5E-08)	2.48E-06 (7.3E-07)	-0.833928 (0.77134)	2.267985 (0.64017)

4.1.3 Error Correction Model

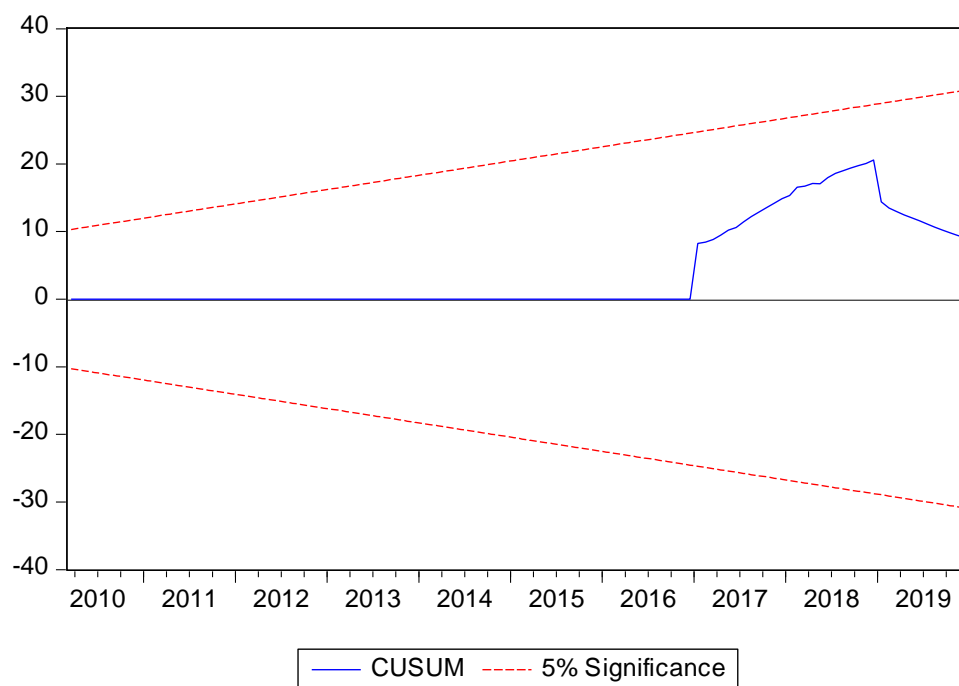
Dependent Variable: D(GDP)
 Method: Least Squares
 Date: 04/08/20 Time: 16:23
 Sample (adjusted): 2009M03 2019M12
 Included observations: 130 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	0.149406	0.088042	1.696992	0.0922
D(CRDT)	0.503712	0.605406	0.832024	0.4070
D(INT)	-166483.5	494942.9	-0.336369	0.7372
D(INF)	4042719.	1170056.	3.455151	0.0008
D(INF(-1))	-3831802.	1252062.	-3.060394	0.0027

D(EXR(-1))	-88522.72	49639.39	-1.783316	0.0770
ECM(-1)	-0.123472	0.038996	-3.166280	0.0020
C	269878.3	617908.5	0.436761	0.6631
<hr/>				
R-squared	0.197606	Mean dependent var	141842.3	
Adjusted R-squared	0.151567	S.D. dependent var	7526098.	
S.E. of regression	6932319.	Akaike info criterion	34.40085	
Sum squared resid	5.86E+15	Schwarz criterion	34.57731	
Log likelihood	-2228.055	Hannan-Quinn criter.	34.47255	
F-statistic	4.292151	Durbin-Watson stat	2.016189	
Prob(F-statistic)	0.000283			

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.055994	Prob. F(2,120)	0.9456
Obs*R-squared	0.121208	Prob. Chi-Square(2)	0.9412



Dependent Variable: GDP
 Method: Least Squares
 Date: 04/08/20 Time: 16:26
 Sample (adjusted): 2009M02 2019M12
 Included observations: 131 after adjustments
 Convergence achieved after 18 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CRDT	0.400308	0.619345	0.646340	0.5192
INT	-117662.3	523371.2	-0.224816	0.8225
INF	4312949.	1108777.	3.889827	0.0002
EXR	15312.72	45680.15	0.335216	0.7380
C	-48506047	24324399	-1.994131	0.0483
AR(1)	0.932152	0.033717	27.64626	0.0000
R-squared	0.929931	Mean dependent var	14422743	
Adjusted R-squared	0.927128	S.D. dependent var	26546275	
S.E. of regression	7166113.	Akaike info criterion	34.45234	
Sum squared resid	6.42E+15	Schwarz criterion	34.58403	
Log likelihood	-2250.629	Hannan-Quinn criter.	34.50586	
F-statistic	331.7904	Durbin-Watson stat	1.756328	
Prob(F-statistic)	0.000000			

Inverted AR Roots .93

4.1.4 Unit Root Tests

The unit root tests results reveal specific attributes as regards the stationarity constituents of the adopted variables. The variables were tested at levels and their first differences. The results are displayed in Tables 4.2 and 4.3 respectively.

Table 4.3: Augment Dickey-Fuller Unit Root Tests at Levels
 (Augment Dickey-Fuller Regressions include an intercept but not a linear trend)

Variable	ADF Statistic	1% Critical Value	Remarks
GDP	-1.66	-2.88	Non-stationary
CRDT	-0.77	-2.89	Non-stationary
INT	-1.56	-2.88	Non-stationary
INF	-2.06	-2.88	Non-stationary
EXR	0.30	-2.88	Non-stationary

Source: Results Extract from E Views 8.0

Table 4.4: Augment Dickey-Fuller Unit Root Tests at first Differences
 (Augment Dickey-Fuller Regressions include an intercept but not a linear trend)

Variable	ADF Statistic	1% Critical Value	Order of Integration	Remarks
<i>D (GDP)</i>	-11.32	-2.88	I(1)	Stationary
<i>D (CRDT)</i>	-3.76	-2.89	I(1)	Stationary
<i>D (INT)</i>	-11.61	-2.88	I(1)	Stationary
<i>D (INF)</i>	-3.96	-2.88	I(1)	Stationary
<i>D (EXR)</i>	-17.71	-2.88	I(1)	Stationary

Note: Note: D denotes first difference of the variable.

Source: Results Extract from E Views 8.0

The results obtained from the unit root test concerning the variables at level in Table 4.4, the ADF test statistic (-1.66) gross domestic product (GDP) value is less than the critical value (-2.88) in absolute terms. Hence, we do not reject the null hypothesis of a unit root at 5 percent level of significance. Accordingly, gross domestic product is non-stationary at level. In the same vein, the other variables are non-stationary at levels. This is because their ADF test statistics are less than the critical value at the 5 percent level. Here, the variables were tested for stationarity at their first differences.

The test results for the unit root test concerning all the variables are at first difference, as shown in Table 4.4, revealed that all the variables are all stationary at first difference in the 5 per cent significance level. This is because the tests by the ADF test statistics are more than the critical value in absolute terms. Thus, we fail to accept the null hypothesis of a unit root at the 5 percent level.

4.1.5 Cointegration Tests

Having established the time series properties of the data, the study proceeded to conduct the Johansen multivariate co-integration test. The results of the test are reported in tables 4.4 and 4.5.

Table 4.5: Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	T race Statistic	0.05 Critical Value	Probability**
None *	0.274854	71.59849	69.81889	0.0358
At most 1	0.152499	30.46150	47.85613	0.6951
At most 2	0.042175	9.282252	29.79707	0.9890
At most 3	0.028998	3.766659	15.49471	0.9214
At most 4	8.19E-09	1.05E-06	3.841466	0.9996

Trace test indicates 1 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Results Extract from E views 8.0

Table 4.6: Unrestricted Co-integration Rank Test (Maximum Eigen value)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Probability**
None *	0.274854	41.13699	33.87687	0.0057
At most 1	0.152499	21.17925	27.58434	0.2655
At most 2	0.042175	5.515593	21.13162	0.9907
At most 3	0.028998	3.766658	14.26460	0.8831
At most 4	8.19E-09	1.05E-06	3.841466	0.9996

Max-Eigen value test indicates 1 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Results Extract from E views 8.0

The cointegration test based on the trace test indicates that there is one co-integrating equation at the 5 percent level. Also, the maximum Eigen value test shows that one co-integrating equation at the 5 percent level. The implication is that a long run link connects the gross domestic product and the explanatory variables in the model.

4.1.6 Analysis of Estimated Parsimonious Error Correction Model

The results of the Error Correction model are presented in Table 4.7.

Table 4.7: Estimated Coefficients of the Dynamic Error Correction Model

Dependent Variable: D(GDP)				
Variable	Coefficient	Standard Error	t-Statistic	Probability
D(GDP(-1))	0.149406	0.088042	1.696992	0.0922
D(CRDT)	0.503712	0.605406	0.832024	0.4070
D(INT)	-166483.5	494942.9	-0.336369	0.7372
D(INF)	4042719.	1170056.	3.455151	0.0008
D(INF(-1))	-3831802.	1252062.	-3.060394	0.0027
D(EXR(-1))	-88522.72	49639.39	-1.783316	0.0770
ECM(-1)	-0.123472	0.038996	-3.166280	0.0020
C	269878.3	617908.5	0.436761	0.6631
R-Squared 0.1976			R-Bar-Squared 0.1516	
DW-Statistic 2.0162			F-Stat. = 4.2921[0.0003]	
Post Estimation Test				
Breusch-Godfrey Serial Correlation LM Test				
Obs*R-squared 0.12 [0.94]				

(Author's computation via E view 8.0)

The error correction method's coefficient of determination, (\square^2) is 0.20 approximately, while 0.15 refers to the value for the adjusted R-squared ($\bar{\square}^2$). What this indicates is that 20 per cent of the systematic variations in GDP are due to the explanatory variables as revealed by the results of the ECM. The value of the adjusted R-squared shows that just about 15 percent of these systematic variations are attributable to the independent variables. The 4.29 value of the F-statistic is actually significant. The results show significance even at the 1 per cent level of

significance. Even the overall fit of the model is significant from the results. A serial correlation test result from Durbin Watson statistic is was 2.0 and this shows that the ECM is not serially correlated though it could be misleading. However, using the serial correlation test of Breusch-Godfrey; revealed a non-serially correlated up to order 2.

4.2 Test of hypotheses

The model that was tested:

$$Y_t = \beta_0 + \beta_1 CRDT + \beta_2 INT_j + \beta_3 EXR + \beta_4 INF + \mu_t$$

$$H_0 - b_{1-3} = 0$$

$$H_2 - b_{1-3} < 0$$

Decision rules, (1) where the calculated t is bigger when compared to the table value, the null hypothesis will be rejected, while the alternative hypothesis will be accepted. (2) When the 5 percent level of significance is lower than the p-value, we do not accept the null hypothesis, but rather accept the alternative hypothesis. The p-value for the model is as follows; CRDT (0.0407), INT (0.737), EXR (0.707) and INF (0.002). The results show that the null hypotheses that states that the CBN's intervention has no significant impact on the GDP as proxied by credit to the private sector (CRDT) is validated. But the second hypotheses that there is no significant GDP/inflation nexus via the CBN's policy is rejected as there is a significant link between inflation and GDP; thus the CBN's policy of moderating inflation impacts on the GDP concerning the economy of Nigeria are rejected for both models.

4.3 Discussion of Findings

The economic criteria are satisfied by all the explanatory variables in the Error Correction model. Thus, coefficient of the previous value of gross domestic product came out positive and significant. Its coefficient is 0.15 and it has a t-value of 1.70 and a p-value of 0.09. This magnitude of t-statistic passed the significance test at the 10 percent level of significance. Hence, on average, should the previous value of gross domestic product increase by a unit, it will improve its current value by approximately 0.15 unit in the short term. The coefficient of private sector credit (CRDT) is 0.50 with a t-statistic of 0.83. This implies that private sector credit has a positive insignificant impact on GDP in the short term in Nigeria. Though the coefficient of interest rate (INT) is negative, it is insignificant even at the 10 percent level. Hence, interest rate has a negative and insignificant effect on output growth in the short term. The coefficient of the current value of the rate of inflation (INF) is seen as significant and positive at the 1 percent level. However, one month lagged value of inflation rate (INF) has a negative and significant effect on gross domestic product in the short run in Nigeria. The forgoing leaves us with the inference that the rate of inflation (INF) effect on the Nigerian economy is rather mixed. The coefficient of the lagged value of exchange rate (EXR) was found to be negative and insignificant. It implies that exchange rate has a negative insignificant impact on the economy in the short term. Finally, the coefficient of adjustment of the Error Correction Model (ECM) is

negative and significant even at the 1 percent level. This shows that the model will dynamically react to return any deviation of the GDP value that exists in the long-run state.

5.0 Conclusion

5.1 Summary of findings

The findings on the nexus between private sector credit and growth was positive but not significant at the 5 and 10 per cent level of significance in the period under study, this is similar to the findings of Mbate(2013) for Sub Saharan Africa and Edward(2018) for Nigeria. Credit to the private sector had increased through the many interventionist policies of the CBN in Nigeria. But the findings show that such increase in funds had not translated into growth enhancement as was anticipated. The conclusions of Arcand et al. (2012) that when loanable funds to the private sector reach 100 per cent of GDP, the resultant impact on GDP is negative. Our findings did run contrary to the findings Olowofeso et al.(2015) that found a positive and significant link between credit to the private sector and GDP in Nigeria.

The interest rate was did show a negative but insignificant impact on output even at 10 per cent level of significance. Jelilov(2016) concluded through empirical analysis that interest rate had only a slight impact on GDP. The nominal anchor that impacts on all interest rate is set at a rate that takes into cognizance inflation stabilization and output growth increase; hence the results can be perplexing as an optimal value is not derived via empirical analysis. Exchange rate was found to have an insignificant but negative effect on GDP. Cakrani (2014) found that for the rate of exchange and GDP, there was no significant connection for the Albanian economy. The adoption of a managed float exchange rate regime might have had a transmission effect or due to the “vanishing effect” as described by Arcand et al.(2011).

This study found that the nexus connecting inflation and GDP to be negative, but significant at the 5 per cent level of significance. Ferdous and Mahbuba (2013) observed that this nexus is dependent on the subsisting situation of the economy at any point in time and same as Ayyoub(2011). Doguwa(2012) identified empirically an inflation threshold of 10.5 to 12 per cent for Nigeria. The CBN adopts a threshold of 6-9 per cent.

5.2 Conclusion

The increase in private sector credit through the various interventionist platforms of the CBN has not transformed into steady growth of Nigeria’s GDP. In fact we agree with Amoo et al.(2017) that credit purveyance has lead to sub-optimality in the observed results and evidence of inefficient decisions as regards the allocation of resources in unfavourable conditions ; leading to a situation of large amounts of piled non-performing credit facilities. This aforementioned perplexity was the core concern of our study. We also agree with Amoo et al. (2017) that given the multiplicity of programmes and the credit it introduced into the economy especially in the private sector by the CBN and other funding institutions; it will not be farfetched it one expresses some doubt about the absorptive capacity of the economy. The CBN did hit its inflation target of 6 to 9 per cent only briefly in the period under study.

5.3 Recommendation

The CBN has to follow up the implementation of a free float exchange rate regime in order free up foreign exchange trapped in its interventionist policy under a regime that was managed and not a free float. The bank has to set up measures that will make the financial markets a destination for foreign investors. More liberal policies and show of policy independence might boost investors' confidence and trust on the economy of Nigeria.

5.4 Contribution to Knowledge

The study has been able to show that the many policy interventions of the CBN has not transformed to increased impact on output. The crowding in expected in increased private sector contribution has not been achieved. The existence low, stagnate or falling GDP growth levels, inflation was no moderated in the period under study. The anticipated growth prospects were not realized, and inflation rates remained a double digit most of the period under study creating perplexing outcome.

5.5 Suggestion for further study

There is a need for an empirical study that will find or suggest an optimal monetary policy index for the CBN. This empirically derived index will assist the bank in charting an effective monetary policy path that will eliminate perplexing outcomes.

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