

# PRIVATE SECTOR CREDIT AND SELECTED MACRO-ECONOMIC VARIABLES

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**Abstract:** This study examined how private sector credit affects selected macro-economic variables in Nigeria using annual data from 1981- 2019. The macro-economic variables selected includes; investment, output and inflation. The study was conducted in the light of the Endogenous growth theory, Demand following and supply leading finance hypotheses as well as the financial repression hypotheses of finance. Vector Autoregressive (VAR) model was adopted to model the relationship among variables because of the apparent interrelations amongst variables. The result of the analysis shows that private sector credit has a significant relationship with economic growth, investment and inflation. It is recommended that there should be intervention in the financial market to ensure adequate private sector financing by designing special funding programs for the private sector in form of business grants and low interest loans as well as reforms in form of laws that will enhance market efficiency over time.

**Keywords:** Private Sector, Credit, Inflation, Output, Investment.

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## 1. INTRODUCTION

In many economies, the private sector plays a key role. In such economies, there are usually a multiplicity of small and large firms employing factors of production and producing varieties of goods and services. The competition among firms in different industries is believed to bring efficiency in the employment of factors of production and the production of goods and services. Among the firms offering their services are firms in the financial sector such as the deposit money banks that provide credit facilities to firms for productive investment. It can be perceived from the macroeconomic setting described here that the efficiency of the private sector in producing goods and services will also depend on the efficiency of the financial sector in providing credit.

In theoretical literature, the impact of the financial sector on the real sector of the economy as well as the effect on real sector activities on the financial sector has been brought to the fore. The supply leading and demand following finance hypothesis are the theoretical arguments that shows that financial institutions through credit creation can drive economic activities in the real sector and vice versa. This has been the basis for empirical studies on finance-led economic growth and economic growth induced financial sector development.

In Nigeria, the numbers of credit creating financial institutions have increased over the years. As is expected in any industry, the presence of many credit creating financial institutions is expected to reduce the cost of financial intermediation, increase the availability of credit and foster financial development. Competition is expected to increase financial sector efficiency, reduce bank concentration, increase access to credit and reduce the cost of financial intermediation, and enhance the flow of financial capital for productive investment.

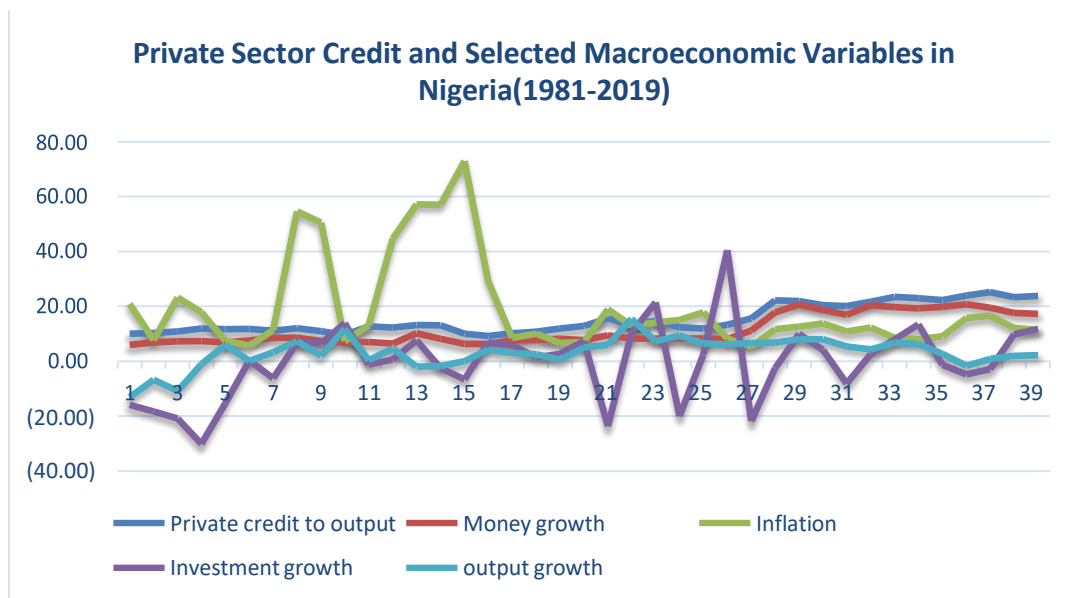


Figure 1: Trends of Private Sector Credit and Selected Macroeconomic Variables in Nigeria

Over the years, private credit has been used as one of the measures of financial deepening in Nigeria and as discussed so far, it is expected that private credit should impact on and also be impacted by some macroeconomic variables. The trend of private sector credit and selected macroeconomic variables in Nigeria in Figure 1 shows that private sector credit, money supply, inflation, investment and output growth move together with varying degrees of fluctuations but cluster around the same range. Only inflation increased above the common trend in the early periods of the observed data. This makes private sector credit an important variable in macroeconomic research in Nigeria because of its expected impact on macroeconomic outcomes in both the real and financial sectors of the economy. Therefore, in this research we examine how private sector credit interacts with selected macroeconomic variables in Nigeria.

**Objectives of the Study**

The following are the specific objectives of the study;

- I. To examine the effect of private sector credit on selected macroeconomic variables (output, inflation, investment, and money supply)
- II. To examine the causal relationship between private credit and selected macroeconomic variables (output, inflation, investment, and money supply)

**Endogenous Growth Theory**

Endogenous growth theory by Romer (1986) and Lucas (1988) among other economists came as a response to criticism of the neo-classical growth theory. The growth model is one in which the long-run growth rate is determined by variables within the model as opposed to an exogenous rate of technological progress as implied by the neoclassical growth model. According to Jhingan (2006) the endogenous growth model explains economic growth in terms of technical progress resulting from the rate of investment, the size of the capital stock and the stock of human capital which are all endogenous factors within an economic model.

Within the framework of the endogenous growth theory, Nnanna, Englama, and Odoko (2004) observed that development in the financial sector which is considered as one of the endogenous factors within an economy can affect the macro economy in various ways. Financial development and innovation can raise the efficiency of financial intermediation, increase the social marginal productivity of capital and also have influence on the private savings rate. This suggests that financial deepening can affect the macro economy positively. In Nigeria and many economies, private credit is considered to be a measure of financial deepening in the economy.

Consequently, the endogenous growth theory is relevant for this study because it shades light on how private sector credit is expected to affect the macro economy.

### **Supply Leading and Demand Following Hypotheses**

The supply leading hypothesis establishes a nexus between financial deepening and economic growth in which it is predicted that the supply of financial resources from the financial sector to the real sector of the economy stimulates economic growth. The finance lead growth hypothesis is traceable to the work of Schumpeter (1911) who explained that the services provided by financial intermediaries such as mobilizing saving, giving loans, evaluating projects, managing risk and facilitating transactions are essential for technological innovation and economic development. His work was also supported by the works of Shaw (1973), McKinnon (1973), King and Levine (1993) and in more recent times Calderon and Lui (2003).

The supply leading hypotheses suggest that there is a causal link between finance and growth. Such causality is expected to flow from finance to economic growth with no feedback effect. This means that a well-functioning financial sector is a pre-condition for economic growth. McKinnon (1973) explained that a well-functioning financial sector minimize transaction cost and asymmetric information, leading to improvement in financial intermediation.

An opposing view of the supply-leading hypothesis is the demand following hypothesis pioneered by Robinson (1952). According to this view, financial deepening depends on growth that occurs in the real sector of the economy. This suggests that causality runs from economic growth to financial deepening. The underpinning of this idea is that increase in demand for financial services leads to financial sector growth (Calderón and Liu, 2002). Singh (1999) further explains that when an economy expands, there is a rise in macroeconomic activities which resultantly increases demand for financial services, leading to developments in the financial sector.

These two opposing views may have been supported by some empirical evidence. However, the study of Patrick (1966) explains why these opposing views exist in what may be referred to as “stage of development” hypotheses. The study concludes that the causal relationship between financial deepening and economic growth depends on the level of development of the economy. Specifically, that the supply-leading hypothesis holds in economies in their early stages of development while the demand-following hypothesis holds in economies in their advance stages of development. The argument here is that when the economy is at the early stages of development, the financial sector plays a catalytic role in stimulating real sector growth but when the economy is at the advance level, there will be increase demand for financial services and hence the real sector will play the leading role in financial sector development.

### **Financial Repression Hypothesis**

Financial repression refers to a situation where government regulations or other market constrain prevent financial institutions from performing its intermediation function efficiently. Such regulations and constraints includes; interest rate ceilings, high bank reserve requirements, capital controls, stringent market entry condition into the financial sector, credit ceilings, credit allocation, and government ownerships of banks. The first study on the impact of financial repression on the economy was done by McKinnon and Shaw (1973) who became the proponents of the financial repression hypotheses. They argue from history, many countries both developed and less developed but especially less developed economies have repressed the financial sector with government interventions and regulations.

Many mainstream development economists have argued that that financial liberalization ensures higher levels of domestic savings and investments and a more efficient allocation of capital (Graham, 1996) Thus, efficiency is associated with a more liberalized and deregulated financial system. Reforms in the financial sector, therefore, is thought to be a major undertaking to promote an efficient allocation of financial resources and stimulate private savings.

It is argued that a repressed financial sector discourages both saving and investment because the rates of return on savings will be lower than what could be obtained in a competitive market and the price of borrowing for investment will also be higher than the market rate. The argument that financial repression inhibit growth and development was the rationale for the recommendation of structural adjustment program for many developing countries in the 1980's including Nigeria (Montiel, 1995; Leechor,1996). The structural adjustment program advocated for extensive liberalization of the financial sector.

Over the years, attempt at financial liberalization have produced a mixture of success and crisis in the developing world. The experiences of some developing economies have shown that outcome of financial liberalization depends on other factors which may include the timing and sequencing of the liberalization measures in relation to the overall macroeconomic conditions. Further, the institutional structure of the financial sector and the adequacy of financial sector supervision may also be important determinants of the success of financial liberalization. (Vos,1993; Montiel, 1995)

These experiences have shown that the possible negative effect of financial repression on the economy does not automatically justify the removal of all regulations and controls that may cause financial repression (Stiglitz, 1993). Many developing countries that liberalized their financial markets have experienced crises that is associated with external shocks that financial liberalization.

introduces or amplifies. It is also pointed out in literature that financial liberalization can create short- term volatility despite its long-term gains. It is also argued that because of market imperfections and information asymmetries, removing all public financial regulations may not create the enabling environment for financial development (Kaminsky and Schmukler, 2002). An alternative to a financial repression could be a new set of regulations that ensures market competition.

## 2. EMPIRICAL LITERATURE

In theoretical discussion, it has been conceived that private sector credit has a relationship with a number of macroeconomic variables. Many empirical studies seek to explore these relationships. Therefore, many empirical studies have been conducted on the relationship between private sector credit and macroeconomic variables.

Olowofeso, Adeleke and Udoji (2015) studied the impact of private Sector credit on economic growth in Nigeria using quarterly data from 2000 to 2014. Their study was Motivated by the need to avoid possible parameter bias that was observed in works, they used Gregory and Hansen (1996) cointegration to account for structural breaks and endogeneity the model of the study was estimated using ordinary least squares procedure. The result shows a cointegrating relationship between economic growth and its selected determinants. An estimate of error correction model confirmed the private sector credit has a positive and significant effect on economic growth while increase has a negative effect on economic growth. They recommend a gradual reduction in interest rate to promote a real sector friendly financial sector.

Were, Nzomoi and Rutto (2012) Studied the impact of private sector credit on the performance of difference sectors of the economy in Kenya. They employed generalized method of moment (GMM) regression. The result indicates that private sector credit has a significant positive effect on sectoral gross domestic product. The finding also shows that the magnitude of the impact gets smaller when factors such as labour employment and past economic performance of the sectors are taken into consideration. The recommend that financial deepening policies that increases access to credit are needed to enhance economic performance.

Mamman and Hashim (2013) studied the impact of credit to private sector on the real sector of Nigerian economy using annual time series data from 1986 to 2010. The data was analyzed using multiple regression. The finding of the study shows that private sector credit has a statistically significant impact on the real sector of Nigeria. They recommend real sector financing through improve credit flow to the private sector as a viable way of growing the economy.

Innocent, Ademola and Glory (2019) studied the effect of bank credits on the Nigerian economy using annual time series data from 1980 to 2017. They employed cointegration test and vector error correction model (VECM). They used GDP as a proxy for the economy while credits to the private sector, public sector and prime lending rate were used as explanatory variables and as proxies of Banks credits. The result of co-integration reveals the existence co-integration among variables which indicates the existence of a long-run among variables. Their findings show that credit to the private sector have positive effect on Nigerian economy while credit to public sector and prime lending rate have negative effect on the Nigerian economy. They recommend that policy makers should focus on long policies that will promote efficient financial market.

Modebe, Ugwuegbe and Ugwuoke (2014) studied the impact of bank credit on the economic growth of Nigerian using annual data from 1986-2012 using ordinary least squares regression (OLS) and causality test. The finding of the study shows that there is a negative and significant relationship between bank credit and economic growth in the long

run and the short run. The result of the causality test reveals a unidirectional causality that runs from GDP to private credit.

Nuno (2012) studied the link between bank lending and economic growth for 27 European countries between 1990 and 2010. The study applied a dynamic panel data Generalized Method of Moment Estimator which permits the researchers to reduce the problems of serial correlation, heteroskedasticity and endogeneity for some explanatory variables. The results show that domestic credit discourages the economic growth while savings promote growth.

Mbate (2013) studied the relationship among domestic debt, economic growth and private sector credit using a dynamic cross-country model of 21 sub-Saharan African countries between 1985 to 2010. Employing the generalized method of moment (GMM) system, the results show that domestic debt is found to crowd out private sector credit by an elasticity of negative 0.3 percent. The study recommends debt ceiling to limit domestic indebtedness, credit availability, and fiscal discipline for African countries to achieve stable economic growth.

Emmanuel, Olupeeka and Adeyinka (2020) examined the effect of commercial banks credit on the performance of the real sector in Nigeria using annual data from 1990 to 2017. Using regression analysis, the study revealed that bank credit and bank lending rate does not have significant effect on real sector in Nigeria. Rather, the study shows the existence of a positive and significant relationship between agricultural credit guarantee scheme fund and agricultural production in Nigeria.

Emecheta and Ibe (2014) studied the relationship between bank credit and economic growth using annual data from 1960 to 2014. The study employed Vector Autoregression (VAR) to model the relationship between variables. The result shows a significant positive relationship between bank credit and economic growth during the period of analysis. Studies with similar findings include Akpansung and Babalola (2012); Oluitan (2012); Onuorah and Ozurumba (2013); and Yakubu and Affoi (2014)

Yao and Eugène (2018) studied the effect of interest rate on credit to private sector in some West African countries using annual data from 1982 to 2015 and applying the Pool Mean Group estimator (PMG) for data analysis. The results revealed that interest rate has a significant negative effect on private sector credit in the long run while inflation has a significant negative effect on credit to the private sector in the long and short run.

Aftab *et al* (2016) studied the long- and short-term effect of interest rate on private sector credit in Pakistan from 1975 to 2011 using Auto Regressive Distribution Lag (ARDL) model. The result of the estimated model reveals that interest rate has a significant negative effect on private sector credit in both the long run and in the short run. The result also shows that exchange rate has a positive effect on private sector credit.

Baokoa, Acheampong and Ibrahima (2017) studied the determinant bank credit in Ghana from 1970 to 2011 using the Autoregressive Distributed Lag (ARDL) framework. The results reveal that monetary variables such as broad money supply, real lending rate, and bank deposits are significant determinants of bank credit in both the short and long-run. It is deduced from the findings lowering the cost of borrowing, and lowering the central bank reserve requirements for commercial banks are necessary to stimulate higher lending and credit demand.

Olokoyo's (2011) studied the determinants of commercial bank's lending behavior in Nigeria. The result shows that among the macroeconomic variables identified, exchange rate movements, interest rate and GDP significantly induce bank credit in Nigeria. Similarly, Sharma and Gounder (2012) studied the factor that drives bank credit to private sector across six economies from 1992 to 2009 using the generalized methods of moments (GMM). The estimated model shows that lending rate negatively affects banks' credit while bank deposit and economic growth enhance the growth in bank credit.

Assefa (2014) studied the determinants of bank credit in Ethiopia using annual data from 1978–2011 and an Autoregressive Distributed Lag (ARDL) model. The estimate shows that in the long, deposits, lending rate, GDP, has a significant effect on bank credit while deposit did not matter in the long run. Money supply had a negative effect on lending both in the short and long run.

Enisan and Oluwafeni (2015) studied the determinants of credit growth in Nigeria. The study adopts the Engle and Granger error correction model (ECM). The findings from the study reveal that bank assets, money supply, risk premium



and inflation have a positive and significant effect on credit growth in the long run while reserve ratio and lending rate negatively affects growth of credit to the private sector. The result also reveals that in the short run real GDP had a negative effect on credit growth.

### 3. SUMMARY OF LITERATURE

The review of literature shows that many studies have been conducted that relate private sector credit to certain macroeconomic variables in Nigeria and other economies around the world. The macroeconomic variables identified from the different studies include real sector, financial sector macroeconomic variables. Therefore, to have a good understanding of how private sector credit relates to the macro economy, it is necessary to include variables from the two sectors in modeling the relationship between private sector credit and the macro economy. In this study, macroeconomic variables selected cut across the real sector, financing.

#### Nature and Sources of Data

All data used for this study are from secondary sources. They are private sector credit as a percentage of GDP(PSCY), inflation rate (INF), GDP growth rate (GDPG), Growth rate in investment (GINV) and money supply as a percentage of GDP(M3Y). Data was sourced from the Central Bank’s Statistical Bulletin and World Bank Development Indicators.

#### Model Specification

The relationship between private sector credit and macroeconomic variables has been explained in various theoretical models such as the supply leading hypothesis, demand following hypothesis, predicting that private sector credit is related to many macroeconomic variables

These theories also suggest the existence of simultaneity in the predicted relationship between private sector credit and macroeconomic variables.

Consequently, this study adopts Vector autoregressive (VAR) modeling to capture the relationship between private sector credit and selected macroeconomic variables in Nigeria. Sims (1980), specified VAR as a theory-free model used in estimating economic relationships that is not restricted to a particular theory. The general form of a VAR model is stated as follows;

$$Y_t = \alpha + \sum_{i=1}^n \beta_i Y_{t-i} + \mu_t \dots \dots \dots 1$$

Where

- Y<sub>t</sub>= Vector of all endogenous variables in the model
- α= vector of constant
- Y<sub>t-i</sub> = matrix of all lag variables in the model
- β= Matrix of the coefficients of all lag variables in the model
- U= Vector of error terms

#### 3.1 Analytical Techniques

The data used for this study is analyzed using econometric techniques and procedures that is considered appropriate for this study. The process is described as follows;

**3.1.1 Pre-Estimation Diagnostics:** Pre estimation diagnostics is carried out to examine the time series properties of the data used for analysis. This involves examining the unit root status of the data used for the analysis. The need for unit root test arises from the fact that if variables have unit root (not stationary), regression performed on such variables will be spurious. A series is considered to be stationary if its mean, variance and covariance are constant over time (Gujarati, 2004). Consequently, Augmented Dickey Fuller (ADF) the decision will be made at 5% level of significance. The outcome of the ADF test informs the appropriate technique to apply next.

**Decision Rule:** Decision is made after comparing the probability value (p value) of the ADF test and the chosen level of significance. The null hypothesis which states that a particular data set has a unit root is rejected if the p value of the ADF test is less than the chosen level of significance.

**3.1.2 VAR Model Estimation:** Following the outcome of the unit root test, the VAR model is estimated. The VAR model captures the interdependencies among variables, making it the appropriate modeling technique given the objectives of this study. All variables in a VAR model are treated symmetrically because for each variable, there is an equation explaining its evolution based on its own lags and the lags of all the other variables in the model. The VAR model of this study is specified by expanding equ (1) to show all the variables in the model as follows;

$$PSCY_t = \alpha_1 + \sum \beta_{11}PSCY_{t-i} + \sum \beta_{12}GDPG_{t-i} + \sum \beta_{13}GINV_{t-i} + \sum \beta_{14}INF_{t-i} + \sum \beta_{15}M3Y_{t-i} + u_1 \dots \dots \dots 2$$

$$GDPG_t = \alpha_2 + \sum \beta_{21}GDPG_{t-i} + \sum \beta_{22}PSCY_{t-i} + \sum \beta_{23}GINV_{t-i} + \sum \beta_{24}INF_{t-i} + \sum \beta_{25}M3Y_{t-i} + u_2 \dots \dots \dots 3$$

$$GINV_t = \alpha_3 + \sum \beta_{31}GINV_{t-i} + \sum \beta_{32}PSCY_{t-i} + \sum \beta_{33}GDPG_{t-i} + \sum \beta_{34}INF_{t-i} + \sum \beta_{35}M3Y_{t-i} + u_3 \dots \dots \dots 4$$

$$INF_t = \alpha_4 + \sum \beta_{41}INF_{t-i} + \sum \beta_{42}PSCY_{t-i} + \sum \beta_{43}GDPG_{t-i} + \sum \beta_{44}GINV_{t-i} + \sum \beta_{45}M3Y_{t-i} + u_4 \dots \dots \dots 5$$

$$M3Y_t = \alpha_5 + \sum \beta_{51}M3Y_{t-i} + \sum \beta_{52}PSCY_{t-i} + \sum \beta_{53}GDPG_{t-i} + \sum \beta_{54}GINV_{t-i} + \sum \beta_{55}INF_{t-i} + u_6 \dots \dots \dots 6$$

Where

PSCY= Private sector credit as a percentage of GDP

GDPG= growth in gross domestic products (GDP)

GINV= growth in Investment

INF= Inflation

M3Y= Broad money supply as a percentage of GDP

t-i= Lags

$\alpha_1 \dots \alpha_8$ = constant terms

$\beta_1 \dots \beta_8$ = coefficients

$u_1 \dots u_8$ = error terms

**3.1.3 Impulse Response Function (IRF):** An impulse response refers to the reaction of any dynamic system in response to some external change. In a VAR model, an impulse response traces out the responsiveness of the exogenous variables in the VAR system to shocks to each of the variables in the VAR model. This means that for each variable from each equation separately, a unit shock is applied to the error, and the effects of such shocks upon the VAR system is observed over time. This is achieved in practice by expressing the VAR model as a Vector Moving Average (VMA). A VAR written as a VMA is of the form;

$$Y_t = \alpha_i + \mu_t + \sum_{n=i}^n \beta \mu_{t-i} \dots \dots \dots 7$$

Where

$Y_t$  = vector matrix (n x 1) of all endogenous variables in the VMA system

$\alpha$  = vector matrix (n x 1) of all intercept in the VMA system

$\mu_t$  = matrix of the current values of the error term

$\beta$  = moving average coefficients

$\mu_{t-i}$  = matrix of all lags of the error term in the VMA system,

**Post Estimation Diagnostics:** These are diagnostic tests used to test for the fulfillment of methodological assumptions of regression estimates such as normality of the error term, absence of autocorrelation and absence of heteroscedasticity in the estimated model. These diagnostic tests are discussed as follows;

**Test for Autocorrelation:** Autocorrelation is a situation where there is correlation between the successive values of the error term in a regression model (Koutsoyannis, 2001). The presence of autocorrelation in an estimated econometric model affects the reliability of the estimated model in the making inference. Hence there is need to test for the presence of autocorrelation. In this study, the LM Test for autocorrelation is applied. The null hypothesis of the LM test states that there is no autocorrelation in the estimated model. The decision rule is that if the p-value of the calculated test statistics is greater than 5% level of significance, the null hypothesis is accepted, indicating that there is absence of autocorrelation in the estimated model. If the p-value is less than the 5% level of significance, the null hypothesis is rejected, indicating the existence of autocorrelation in the estimated regression model.

**Test for Heteroscedasticity:** Heteroscedasticity test is used to determine whether the error term of the estimated econometric model has constant variance or does not have constant variance. The need for the constant variance of the error term is because the test statistics for statistical significance of the estimated model coefficients will not be reliable if the error term does not have constant variance (Gujarati, 2004). In this study, ARCH heteroscedasticity test is applied. The null hypothesis states that there is no heteroscedasticity in the model. The decision rule is that if the P value of the estimated statistics is greater than 5% level of significance, the null hypothesis is accepted, indicating that there is absence of heteroscedasticity in the estimated model. If the reverse is the case the null hypothesis is rejected, indicating the presence of heteroscedasticity in the estimated model.

**Normality Test**

This is used to determine whether the error term in a regression model is normally distributed in line with the assumption of the applied econometric technique for this study. The need for normality test arises from the fact that the test of significance of the estimated coefficients is based on the assumption that the error term is normally distributed. In this analysis, the Jarque- Bera (JB) test for normality is adopted. The JB statistics follows the chi-square ( $X^2$ ) distribution with 2 degrees of freedom. The decision is made at 5% level of significance. The null hypothesis of the JB test states that the error term is normally distributed. Normality is indicated when the probability value of the JB-statistics is greater than the chosen level of significance because the null hypothesis could not be rejected.

**4. RESULT, ANALYSIS AND DISCUSSION OF FINDINGS**

In this chapter the result of the application of the stated econometrics and procedures is presented, analyzed and discussed.

**Unit Root Test Result**

The result of unit root test for all the time series variables used in the model of this study is presented as follows;

**Table 1: Unit Root Test Result**

Variables	ADF Stat	Critical Value			P Value	REMARKS
		10%	5%	1%		
PSCY	-5.012315	-2.610263	-2.943427	-3.621023	0.0002	I(1)
GDPG	-4.158601	-2.609066	-2.941145	-3.615588	0.0024	I(0)
GINV	-2.748866	-2.611531	-2.945842	-3.626784	0.0759	I(0)
INF	-3.520608	-2.610263	-2.943427	-3.621023	0.0129	I(0)
M3Y	-5.892947	-2.610263	-2.943427	-3.621023	0.0000	I(1)

SOURCE: Author’s computation using E views

The result of unit root test in table above shows that PSCY and M3Y are stationary at first difference while GDPG, GINV, INF are stationary at levels. Given the result of stationary test which shows that variables for this study are a mix of I(0) and I(1), we proceed to estimate a vector autoregressive model for the study.



Optimal Lag Length Selection

Table 2: VAR Lag Order Selection Criteria

Endogenous variables: PSCY GINV GDPG INF INR M3Y						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-711.5168	NA	31650134	39.97316	40.32505	40.09598
1	-545.107	249.6147	116693.9	34.28372	37.45076*	35.3891
2	-459.2016	90.67795*	11579.28*	29.06675*	39.04894	35.15469
3	-330.3155	78.7637	60518.08	32.46197	38.2593	32.53248*

\* Indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level) FPE: Final prediction error

AIC: Akaike information criterion SC: Schwarz information criterion

The result of the VAR lag length selection test shows that most of the lag length selection criteria shows that lag two is the optimal lag for the set of data used for this study. Consequently, the VAR model is estimated in two lags.

Vector Auto regression (VAR) Estimate

The relevant coefficients of the VAR estimate are presented as follows;

Table 3: VAR Result

	PSCY	GINV	GDPG	INF	M3Y
<b>PSCY(-1)</b>	0.755965	<b>0.261109**</b>	<b>0.967830*</b>	<b>2.569202*</b>	<b>0.476338**</b>
Standard errors	(0.28537)	<b>(0.12933)</b>	<b>(0.62518)</b>	<b>(1.53770)</b>	<b>(0.27705)</b>
t-statistics	[ 2.64908]	[ <b>2.01893</b> ]	[ <b>1.54809</b> ]	[ <b>1.6708</b> ]	[ <b>1.71935</b> ]
<b>PSCY(-2)</b>	-0.349946	2.020777	0.377730	-2.668500	-0.302426
Standard errors	(0.29129)	(1.72829)	(0.63816)	(2.08002)	(0.28280)
t-statistics	[-1.20135]	[ 1.16924]	[ 0.59190]	[-1.28292]	[-1.06940]

Source: Author's Estimation using E views 9

\* indicates 10% statistical significant

\*\* indicates 5% statistical significant

\*\*\* indicates 1% statistical significant

Note: Fine the full details of the VAR estimate at the appendix

Table 3 shows the VAR regression result for this study. The values in bracket are the standard errors while the values in parenthesis are the t- test statistics of the estimated coefficient. The result of the estimated VAR model presented in Table 4 shows that private sector credit (PSCY) is positively and significantly related to investment (GINV), output (GDPG) and inflation (INF) at lag one. The result shows that a 1% rise in PSCY leads to 0.26% growth in investment (GINV), a 1% increase in PSCY leads a 0.96% growth in output and a 1% increase in PSCY leads to a 2.6% increase in general prices. Private sector credit (PSCY) at lag one has a significant effect on money supply (M3Y). the result shows that a 1% increase in PSCY leads to 0.47% increase in money supply.

4.1 Post Estimation Diagnostics

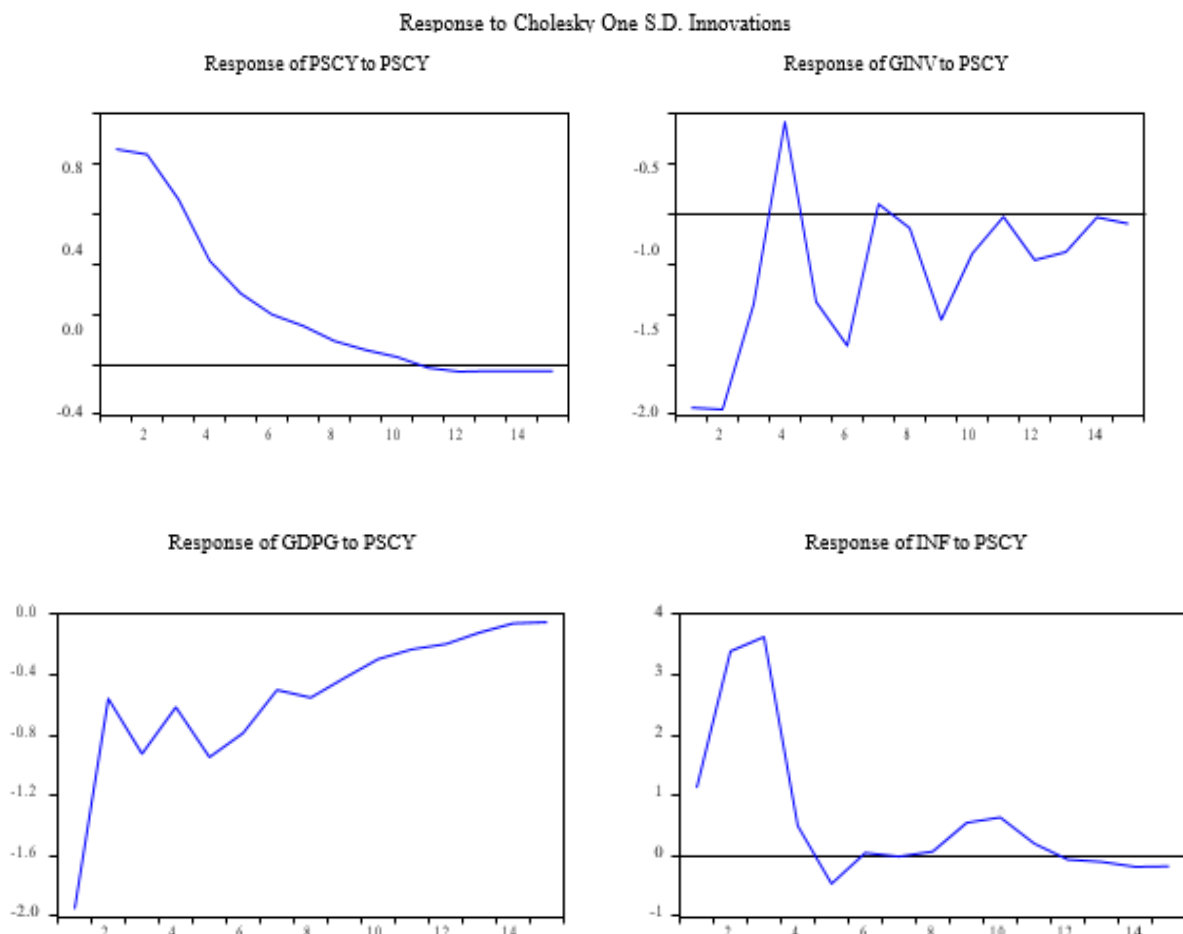
Table 4: Diagnostic Test Result Diagnostic Tests

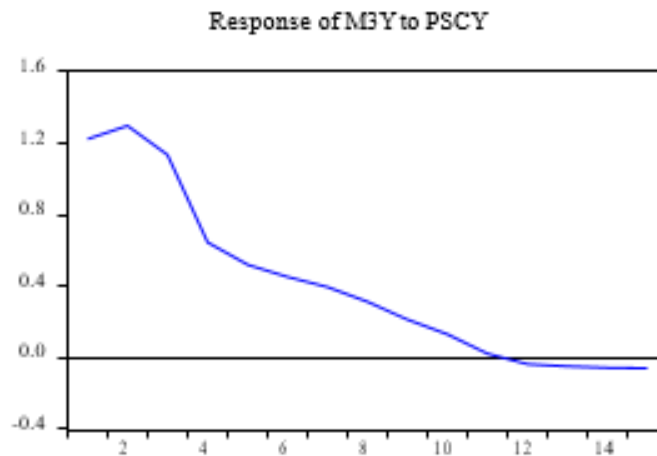
Test Result Diagnostic Tests			
<b>VAR LM Test:</b>			
Lag 1	64.87837	P Value	0.4458
Lag 2	70.76753	P Value	0.1768
<b>Heteroskedasticity Test</b>			
Chi Square	1184.000	P Value	0.2500
<b>Normality Test</b>			
Jarque-Bera(JB) Stat.	18.57268	P Value	0.2914

Source: Author’s computation using and Eviews 9

The LM test for autocorrelation, test for heteroscedasticity, and JB normality test result in Table 4 indicates that there is absence of autocorrelation, that there is absence of heteroscedasticity and that the error term of the estimated model is normally distributed. This is because the P values are higher than the acceptable levels of statistical significance, hence the null hypothesis of the respective test which states that there is no autocorrelation, no heteroscedasticity, and that the error term is normally distributed cannot be rejected.

Impulse Response Function

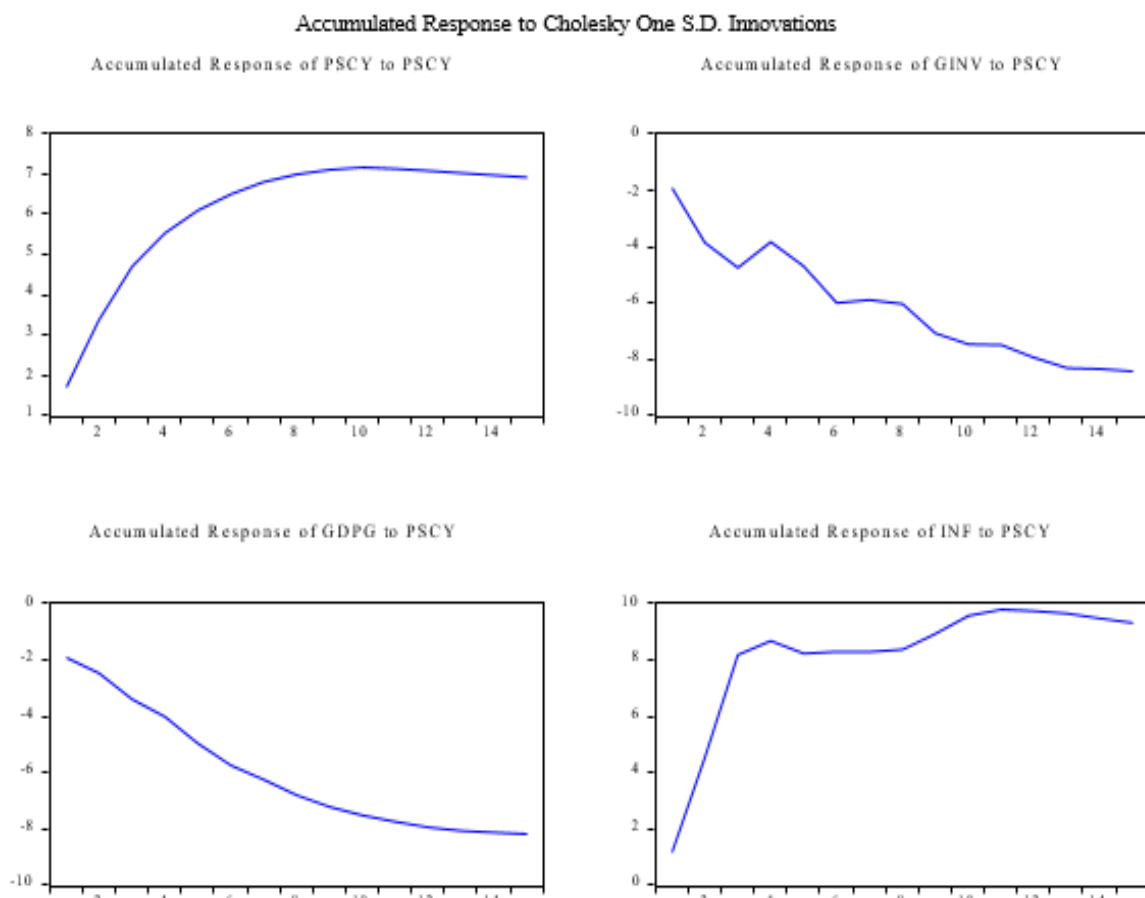


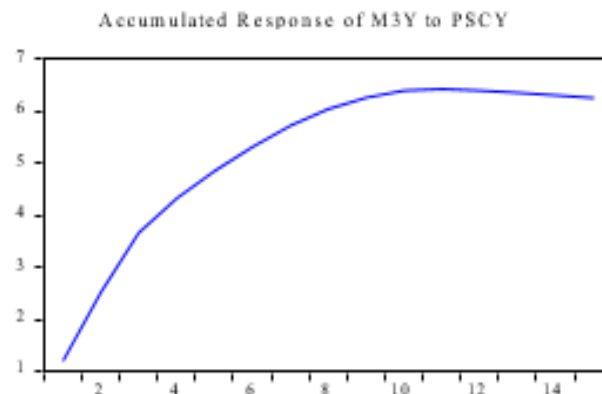


**Figure 2: Impulse Response Function of GINV, GDPD, INF and M3Y to PSCY**

The response of GINV, GDPG and INF to PSCY shows that the response of GINV to PSCY is increasing and fluctuating largely within the negative range. The response of GDPG to

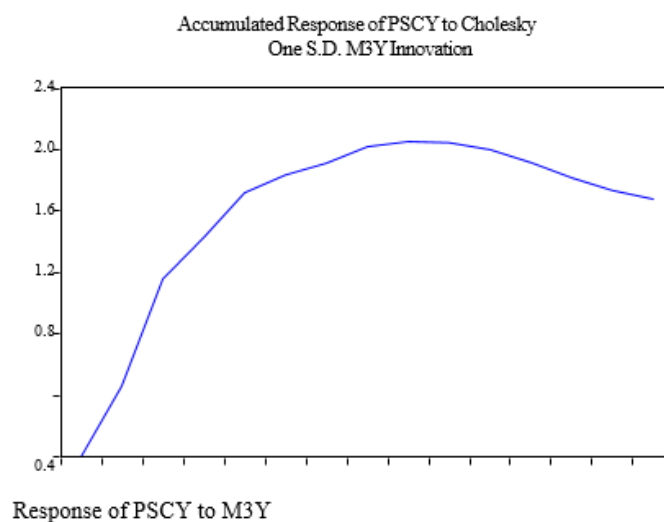
PSCY is also increasing but stays within the negative range while the response of INF to PSCY is increasing and positive in the initial period but decline in later periods within the positive range of the graph.





**Figure 3: Cumulative Impulse Response Function of GINV, GDPD, INF and MY3 to PSCY**

The accumulated response of GINV, GDPG and INF to PSCY shows that the response of GINV and GDPG to PSCY is declining while the response of INF to PSCY is increasing throughout the observed period of analysis.



**Figure 4: shows that private sector credit responds positively to money supply throughout the observed period.**

### 5. DISCUSSION OF FINDINGS

Private sector credit is shown to have a positive and significant relationship with investment and output growth. This is also expected because increase in private sector credit should lead to a rise in investment and output. Although the coefficient of the estimated relationships for the two variables is shown to be positive, the impulse response function shows that although the response of investment and output is increasing, the increase is within the negative range producing a declining cumulative response. This indicates that private sector credit over the years has the potential to drive investment and output but has not been adequate.

As shown in the data used for this analysis, private sector credit as a percentage of output is less than 10% for most of the years within the period of this analysis, producing an average of about 11% for the period of this analysis with a minimum of 5.9% and a maximum of 20.8%. This is significantly low compared to thriving emerging and developed economies in the world with vibrant private sectors. As shown in this study, the size of private sector finance is significantly higher than the size of output in many emerging and developed economies in the world, producing the private sector credit to output ratio of over 100% in many of such economies. Private sector credit also has a positive and significant relationship with inflation. When credit to private sector increases, aggregate expenditure also increases, leading to a rise in general prices.

Private sector credit has a significant positive effect on money supply. Private sector credit also responds positively to shocks in money supply. This is also in line with theoretical expectations. Increase in money supply due to the policy decisions of the monetary authority such as reduction in reserve ratio or reduction in policy interest rate and other policies of the monetary authority allow commercial banks to increase the supply of loans to the public and a fall in lending interest rate, leading to a rise in private sector credit.

Private sector credit is an important financial deepening indicator around the world and a measure of the level of financial intermediation in any economy. The findings of this study shows that there is a significant relationship between private sector credit and selected macroeconomic variables of this study. As shown in the study, variables considered cut across the real sector and financial sectors. On theoretical basis, money supply was expected to affect private sector credit while private sector credit was expected to impact on all the selected macroeconomic variables, including money supply. Specifically, real sector variables namely; investment, output and inflation which are usually indicators of macroeconomic performance were expected to be enhanced or impacted by private sector credit.

The findings of the study shows that there is a significant relationship between private sector credit and the selected macroeconomic variables. However, although the response of investment and output to private sector credit is increasing, the accumulated responses show that private sector financing contributes little to investment and output growth. This is connected with the level of financial intermediation in Nigeria. As stated in the problem statement of this study, private sector financing in Nigeria is very low compared to some emerging market economies of the world. Therefore, private sector financing could be considered to be an important driver of investment and economic growth that should be the focus financial sector policies.

## 6. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are offered

- i) The financial market should not be relied upon for efficient allocation of financial resources to the private sector. This is because as shown in the study, financial institutions have not performed its financial intermediation function efficiently as shown in the financial deepening indicator of private sector credit to output over the years. This is significant because private sector credit is known to be an important driver of macroeconomic performance in market economies. Hence, there should be government intervention in the financial market to ensure adequate private sector financing. This could be done by designing special funding programs for the private sector in form of business grants and low interest loans.
- ii) While intervening in the financial market, there should also be reforms in form of laws that will enhance market efficiency over time.

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