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An Examination of the Factors that Influence the Provision of Credit to the Private Sector in Nigeria

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Abstract: The determinants of private sector credit investigation are a topic that should inspire domestic investors and policy makers, more so in a country like Nigeria where investment funding is constrained by several factors. The objective of the present study was to investigate the factors that influenced the credit to the private sector in Nigeria. By including foreign interest rate, the study improved on existing literature as it accommodates the impact of exogenous factor that could influence the domestic credit provision in Nigeria. This study employed both the Fully Modified Ordinary Least Squares (FMOLS) and the Dynamic Ordinary Least Squares (DOLS) with monthly series that spanned

the period from 2007M1 to 2021M12 to determine the factors that influence private sector credit in Nigeria. The used variables were: the private sector credit, bank reserves, (PhD Economics), the exchange rate, federal funds rate, prime lending rate, broad money supply and inflation rate. The study revealed that a long-run relationship existed among the variables. In addition, the exchange rate and the US federal fund rate negatively and significantly impacted on the private sector credit in the two models. However, the broad money supply, inflation rate, bank reserves and prime lending rate were shown to impact positively and significantly on the private sector credit. The study concluded that even though boosting domestic credit provision was paramount, excess credit extension could affect the achievement of macroeconomic objectives of price and exchange rate stability. Consequently, it is the contention of the study that fiscal measures should be aligned with monetary policy measures in order to improve the productivity. The improved productivity is capable of controlling inflation and fluctuations in the exchange rate, thereby relieving the pressure on the monetary authorities to boost domestic credit on one hand and on the other hand struggle to maintain both price and exchange rate stability.

Keywords: private sector credit, broad money supply, bank reserves, exchange rate.

Introduction

The role of commercial banks in stimulating the domestic credit has been largely emphasised in literature. The intermediary role of commercial banks takes the form of mobilisation of funds from savers and channelling such to borrowers at lower financial costs. The importance of domestic credit extension for the private investment has been noted by Frimpong and Marbuah (2010) to generate employment, raise the rate of growth and reduce poverty. Availability of the credit therefore improves investment and hence, raises economic growth (Colombo & Paccagnini, 2020). In another vein, a country's financial stability has been observed to be influenced by the growth in credit (Ghosh, 2010). Excess credit for instance can raise the price level, while shortage of credit can retard investment and the growth of the economy.

The picture domestic credit provision to the private sector in Nigeria has not been impressive. Okere and Ugonma (2020) observed that in 1980 credit to the private sector was 66.7% of gross credit in the economy and this reduced to 59.7% in 1981 and further decreased to 52.1% in 1982. In 1986, the figure drastically decreased to 28.9% and rose to 34.0% in 1993. The figure has reduced further in recent times as Ozili et al. (2023) observed that domestic credit to the private sector as a ratio of gross domestic product (GDP) was 12.1% in 2020 which is very low compared to the global benchmark of 50%. Between January and December 2021, bank credit to the private sector marginally rose by 16.67%. As observed by Sogules and Nkoro (2016), private sector credit remains unsustainable in Nigeria.

In Nigeria, the private sector credit has been hampered by several factors and over the years the regulatory authorities have adopted several strategies to address these. Lack of requisite collateral on the part of investors, high lending rate, inability to repay borrowed funds as and when due to the lack of banks' preference for medium and long-term financing are among the factors that hamper private sector credit. In addition to these, incessant government borrowing from the banking sub-sector and poor capital base impact adversely on private sector credit in Nigeria. Other contributory factors as noted by Ozili and Ndah (2021) include fluctuations in oil revenue, high incidence of non-performing loans and frequent use of unconventional monetary policy by the Central Bank of Nigeria.

In order to address the problem associated with low capitalisation, the Central Bank of Nigeria (CBN) in July 2004 announced the banking sector capitalisation from two billion naira to 25 billion naira which was to take effect from December, 2005. As observed by Ejokor et al. (2016), the continuous distress as well as the poor capacity of the banks to extend credit led to the need for an increase in the capital base of the banks. The gains made through bank capitalization with respect to improved private sector credit extension were however eroded by the 2008 global financial crisis. As observed by Pakasa

et al. (2023), before the global financial crisis, excess liquidity existed at the global level which led to expansion in credit within that period. As noted by Nzeh et al. (2022), in July 2010 the Asset Management Corporation of Nigeria (AMCON) was introduced as a reaction to the issue of non-performing loans that the banks faced, mainly after the global financial crisis. It is also noteworthy to state that the high rate of inflation in the country has been responsible for the upward adjustment in the benchmark rate (monetary policy rate) which influences other interest rates in the economy. The implication of this is that cost of borrowing is very high in the country.

In this study, the emphasis was placed on the determinants of private sector credit in Nigeria. The study considered the impact of both domestic and foreign factors on the credit to the private sector. This paper is of the view that concentrating only on the impact of domestic factors as done by previous studies (Akani & Onyema, 2017; Gbenga et al., 2019) is not adequate in investigating the determinants of private sector credit in Nigeria. The global liberalisation of the economic and financial system implies that events in other countries are capable of transmitting to the domestic economy with wider repercussions. It is against this backdrop that this present study included the US federal fund rate which represents foreign interest rate in the model that specified the determinants of credit to the private sector in Nigeria. Two cointegrating models, namely: The Fully Modified Ordinary Least Squares (FMOLS) and the Dynamic Ordinary Least Squares (DOLS) are used to estimate the results of the study.

The rest of the study is structured as follows: section one handles the introduction, research problem, scope of the study, stylized facts, objectives of the study, research questions and research hypotheses. Section two addresses the theoretical and empirical literature, section three handles model specification, data sources and justification, section four handles results and discussion, section five handles conclusion, recommendation and suggestion for further studies.

Research Problem

A facilitating access to the credit provision in Nigeria has become an issue that occupies the attention of policy makers over the years. Despite the preponderance of policies to address the constraints to credit provision, producers and other economic agents still lament over the high cost of access to credit in the country. The lack of access to domestic credit has led to low business expansion and the inability of people to venture into new businesses which has led to rising unemployment in the country. In literature, several factors have been identified as the determinants of private sector credit. However, to the best of the knowledge of this study, past studies mainly focused on domestic factors; thereby ignoring exogenous factors which could as well influence domestic credit. The inability to factor external factors in models used to estimate the determinants of domestic credit could pose a policy challenge since financial liberalisation which has become a norm in recent times means that countries are internationally linked. This means that events in one country can transmit to other countries. Equally, this present study improves on existing literature by using the FMOLS and DOLS models that handle both long-run relationship and the endogeneity problem which is a major issue in monetary variables.

Scope of the Study

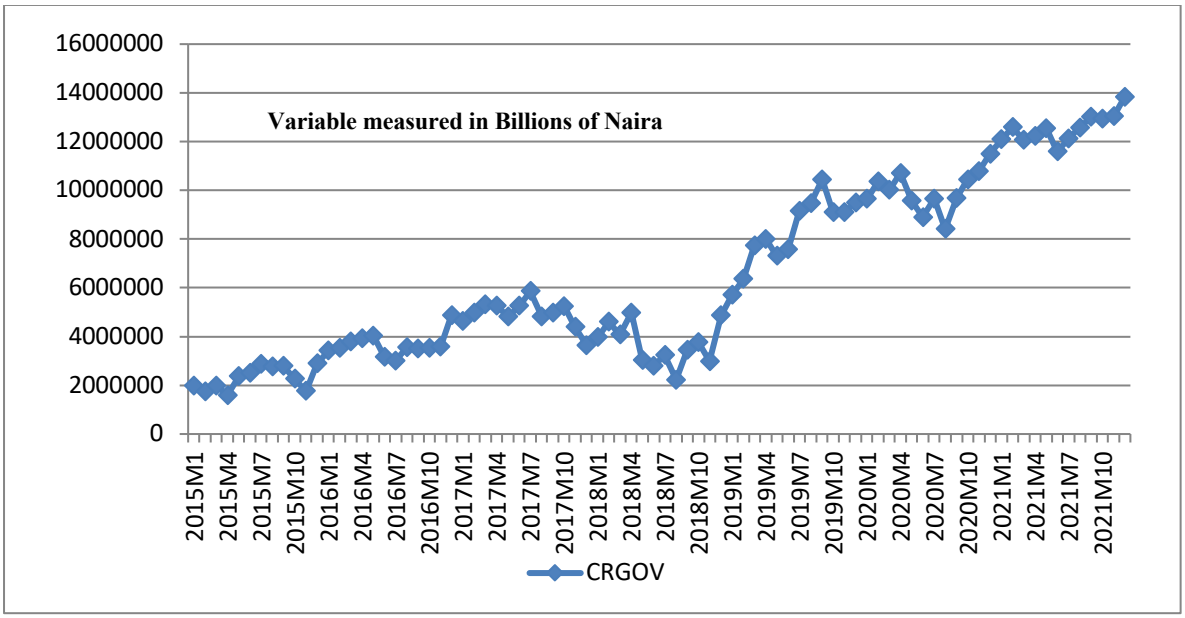
The focus of this study was to examine the determinants of credit to the private sector in Nigeria. The study used monthly data that covered the period from 2007M1 to 2021M12 under the frameworks of the fully modified ordinary least squares (FMOLS) and the dynamic ordinary least squares (DOLS). Apart from data on US federal funds rate that was obtained from the Federal Bank of St Louis data on other variables were sourced from the Central Bank of Nigeria Statistical Bulletin. A major limitation encountered in the study is lack of monthly data on some relevant models, even though their non-inclusion in the study did not affect the achievement of the objectives of the study.

Stylised Facts

The issue of the crowding out effect of the borrowing by the government on the credit to the private sector has been giving concerns to Nigerian investors over the years. In order to fill the shortfall in revenue, both the state and the federal governments have been borrowing from the financial institutions. This exercise influenced the ability of the private sector to borrow from the same financial institutions. In Figure 1 evidence shows that credit to the government has been on the rising trend over the years. Beginning from 2015, there is growth in government borrowing and this got to a peak in June 2017 after which it descended and got to a trough in August 2018. However, beginning from November 2018 credit to the government assumed a rising trend. This scenario portends an obstacle for the private sector who struggle to raise funds from the financial institutions.

Figure 1

Trend in Credit to Government



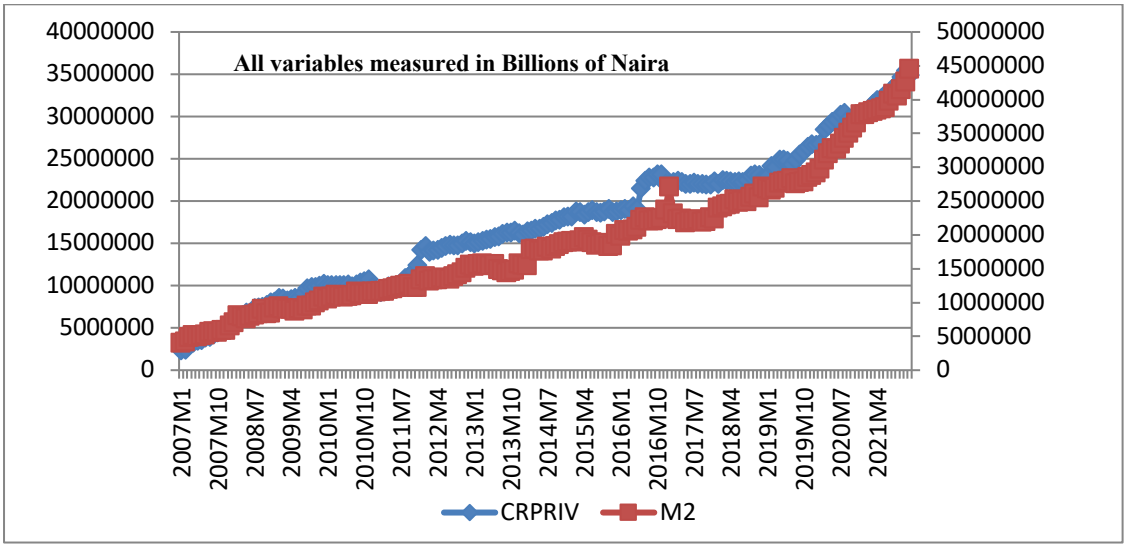
Note. CRGOV – credit to government.

Source: own compilation.

The credit provision has been noted to be spurred by money supply. Rising money supply has the tendency to transmit to credit extension and the transmission mechanism is through bank reserves. This is the major reason why the monetary authorities usually apply monetary policy instruments to lower the monetary impact of increasing money supply. In periods of rising capital inflows, especially during rising oil price, the CBN usually uses monetary policy measures to reduce money supply occasioned by these inflows. The target is to reduce the liquidity in the banking system so as to avoid the rise in inflation. By implication, it is expected that the private sector credit should trend in the same pattern with both money supply and bank reserves. Figures 2 and 3 support this hypothesis as it is shown that private sector credit moved in the same direction with the broad money supply and bank reserves, respectively. They trended up in most of the periods though with some periods of slight fluctuations. The trend in the private sector credit and broad money supply in most of the period was almost similar.

Figure 2

Trend in Credit to the Private Sector and Broad Money Supply (M2)

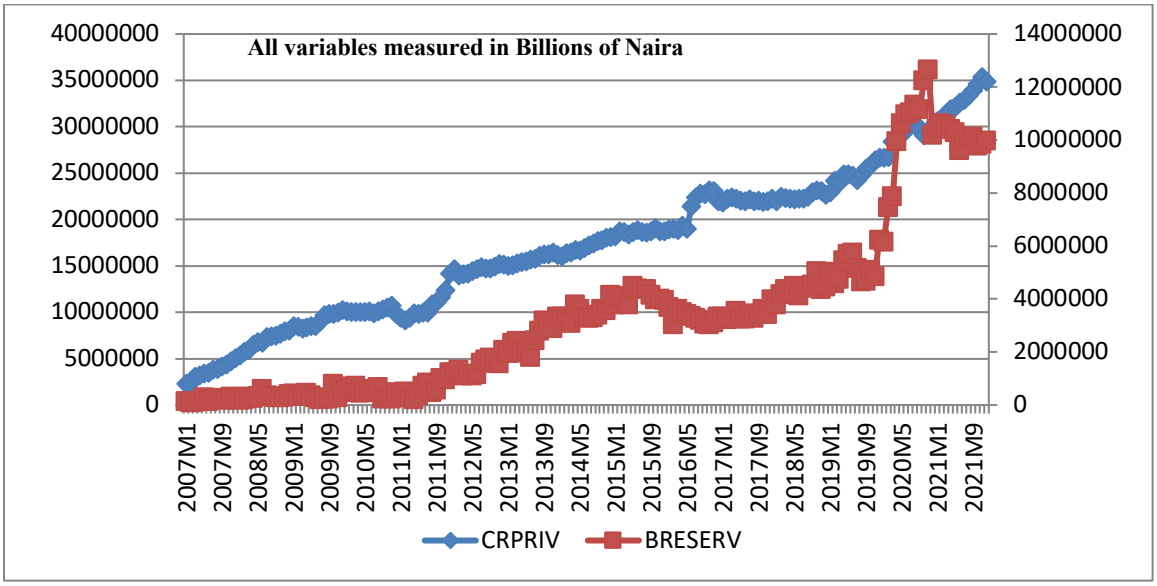


Note. CRPRIV – credit to private sector, M2 – broad money supply.

Source: own compilation.

Figure 3

Trend in Credit to Private Sector and Bank Reserves



Note. BRESERV – bank reserves.

Source: own compilation.

Objectives of the Study

Following from the aforementioned stated problems, the broad objective of the study was to examine the factors that determined the credit to the private sector in Nigeria. However, the specific objectives were:

i. To examine the impact of bank reserves, exchange rate, federal funds rate, prime lending rate, broad money supply and inflation rate on the credit to the private sector in Nigeria.
ii. To ascertain if a long-run relationship exists among the variables in Nigeria.

Research Questions

Following the stated objectives, the following research questions guided this paper:

i. Do bank reserves, exchange rate, federal funds rate, prime lending rate, broad money supply and inflation rate impact on the credit to the private sector in Nigeria?
ii. Is there any long-run relationship among the variables in Nigeria?

Research Hypotheses

On the ground of the aforementioned research questions the following hypotheses guided the paper:

i. Bank reserves, exchange rate, federal funds rate, prime lending rate, broad money supply and inflation rate do not have significant impact on the credit to the private sector in Nigeria.
ii. There is no long-run relationship among the variables in Nigeria.

Theoretical Literature

The relevance of credit to the economy has led some scholars to provide theoretical backgrounds on its determinants and its impact on economic performance. McKinnon (1973) and Miller (1998) proposed the theory of finance and growth by arguing that the channel through which credit assists the productive activities of firms are the debt instruments raised in the financial markets. Through this, there is an increase in the output of the economy, thus resulting in higher growth of the economy. In another vein, the difference between lending view and credit rationing view has been stressed. Kashyap and Stein (1995) contend that the lending view relates to how policy actions of the monetary authorities influence the changes in the demand for and the supply of credit. Accordingly, the volume of new credit supplied will fall and the loan rates are expected to increase in relation to the market rates if the monetary authorities embark on monetary policy tightening. This policy action raises loan supply in relation to credit demand. On the other hand, the credit rationing view stresses that, while the volume of new loans would fall in response to monetary policy tightening, bank loan rates would increase proportionally but by lower than the market rates. However, Bernanke and Gertler (1995) noted that interest rate and credit are the transmission mechanisms through which monetary policy actions influence the supply of loan and demand dynamics. This finds support in Hurlin and Kierzenkowsk (2002) which contend that the bank lending channel leads to a more restrictive monetary policy. Cheong and Boodoo (2008) equally noted that monetary policy actions influence short term market rates such as treasury bill rates and the interbank rate, which finally influences long term market rates and loan demand.

In another angle, the market power theory was developed to explain the link between the size of bank and profitability. Following this, Berger (1995) contended that only large commercial banks can mop up more deposits, influence interest rates and lend more, thus affording them more profits. The argument is that large commercial banks can achieve this because they are characterised by differentiated products. In a similar way, efficiency structure hypothesis opines that large commercial banks can extend more credit and earn high profits as a result of increased scale of economies (Olweny & Shipho, 2011). Furthermore, Hahn (2015) noted that monetary policy rate changes affect growth because they will alter the level of credit supply which will affect the economy's aggregate demand, leading to improvements in the level of investment, production and economic growth. The role of a functional financial system in enhancing the credit expansion has been stressed by scholars such as Levine (2005). The argument is that sound and well-developed financial system has the potential to enhance better financial resources allocation (Danthine & Donaldson, 2005).

As observed by some scholars, the bank deposits and monetary policy are directly related and that the supply of loanable funds largely depends on bank deposits. Thus, if there is a contractionary

monetary policy, such will erode bank deposits and by extension reduces bank lending. However, Disyatat (2010) had a contrary view towards this transmission mechanism as the study argued that credit provision of banks is induced by a certain multiple of their capital which is based on either market discipline or regulation. The study contended that within this limit, the growth of the supply of bank credit is dictated by the interaction between the demand and supply of bank loans. The growth-enhancing impact of changes in monetary policy rate through domestic credit which has been emphasised by Hahn (2015) and other scholars has been interrogated. In retrospect, the argument of the theory is that variations in monetary policy alter credit supply and such will influence aggregate demand, thus leading to significant changes in investment and the growth of output. However, some scholars such as Stiglitz (2018) have countered this contention by arguing that monetary policy is not effective in changing credit supply level because money supply does not really matter, but credit availability and the terms upon which credit is made available are the factors that matter.

Empirical Literature

The relevance of the credit has encouraged a plethora of studies that have investigated several determinants of domestic credit. In a cross-country study involving 24 emerging market economies, Gozgor (2013) used a dynamic panel framework to reveal that real trade openness, liberal monetary policy and the difference between domestic and external lending rates had positive impact on domestic credit. However, the impact of perceptions of global risk and external balance was negative. Using the vector error correction model (VECM) approach, Shijaku and Kalluci (2013) showed that economic growth, lower cost of lending and reduced government borrowing encouraged more lending in Albania. In Uganda, Nampewo et al. (2016) used the VECM to show that in the long-run, mobile money impacted positively to the credit to the private sector. Using the autoregressive distributed lag (ARDL) framework in a study for Ghana, Baoko et al. (2017) revealed that bank assets, broad money supply, bank deposits and real lending rate influenced bank credit significantly. Also, in the short-run, while inflation had positive and significant impact, the impact of rising deposits mobilization by banks was not found to increase the supply of private sector credit. For Nigeria, Akani and Onyema (2017) found that while inflation rate, public expenditure and capital formation depressed net domestic credit, the impact of balance of payment, government revenue and real GDP was positive. Also, the study found that interest rate and Treasury bill rate impacted negatively on the net domestic credit, while the impact of broad money supply, monetary policy rate and financial deepening was positive.

In another cross-country paper involving the Organization for Economic Cooperation and Development (OECD) countries, Al-Shammari and El-Sakka (2018) disclosed that foreign liabilities, money supply, exchange rates, inflation, fixed capital formation and GDP were the factors that determine domestic credit in the long-run. Another study for Ghana by Obeng-Amponsah et al. (2019) indicated that a short-run significant relationship existed between credit to the private sector, broad money supply and gross capital formation. Also, gross capital formation was found to Granger-cause private sector credit. In another study for Nigeria, Gbenga et al. (2019) revealed that both money supply and economic growth had significant link with credit to private sector in Nigeria. The significant impact of broad money supply found support in Akani and Onyema (2017). A study in Zambia by Funyina (2020) used the fixed effects panel model to reveal that liquidity ratio, cash reserve ratio, bank size, foreign funding, domestic deposits, Bank of Zambia policy rate, inflation, total government, etc had significant effect on bank credit. In Papua New Guinea, Kasingu et al. (2020) used the ARDL to reveal that commercial banks deposits, real GDP, net foreign assets and real effective exchange rate positively and significantly impacted on the credit to the private sector in both the short and the long-run

In Ghana, Obeng-Amponsah et al. (2021) revealed that the bank loans denominated in foreign currencies responded more to the change in monetary situations abroad than in home country. In another study in Ghana, Asiamah et al. (2021) revealed that while tertiary education had positive and significant impact on credit requests, its impact on credit constraints was negative. In another study in

Nigeria, Eseyin et al. (2022) found that interest rate, real GDP and domestic debt have significant impact on amount of credit extended to the private sector. In Bangladesh, Islam (2022) found that increase in real interest rate, money supply stability, sustainable growth in GDP and high degree of trade openness were the major determinants of private sector credit. In a study for the Association of South East Asian Nations (ASEAN 5) which comprise Indonesia, Malaysia, Philippine, Singapore and Thailand, Aryestya and Marta (2022) used the generalized method of moments (GMM) to show that an inverted U shape link exists between bank lending and economic growth. In Malaysia, Pakasa et al. (2023) used the vector auto-regression (VAR) method to show that broad money and gross capital formation had negative link with credit to private sector. In Tanzania, Ndanshau and Semu (2023) revealed that while the economic growth had positive impact on bank credit supply, the impact of inflation was negative.

From the empirical studies reviewed, among the papers that focus on Nigeria, evidence shows that the variables considered to influence credit to the private sector are domestic variables. Nigeria, just like any other modern country is linked to the world financial system and as such external factors such as differences in world interest rate can have influence on the domestic monetary condition. This could have repercussion to domestic interest rate, thus transmits to the credit extension of deposit money banks. This study therefore filled such gap by including the federal funds rate which serves as world interest rate that influences other interest rates. The differences between the world interest rate and domestic interest rate could impact on the credit ability of the country's deposit money banks. The study also improves on past studies by employing models that handle measurement errors and also allows for long-run heterogeneity.

Research Methodology

This study carried out some pre-diagnostic tests such as the descriptive statistics, the unit root tests and the cointegration test in order to examine the variables of interest behavior. While the test of stationarity was carried out using both the augmented Dickey-Fuller (ADF) and the Philip-Perron (PP) tests, the test for cointegration was conducted using the autoregressive distributed lag (ARDL) bounds. ARDL was chosen for the test of cointegration because the results of the unit root indicated that the series have mixed order of integration. To examine the factors that influence the private sector credit, two cointegration models; namely: the fully modified ordinary least squares (FMOLS) and the dynamic ordinary least squares (DOLS) respectively developed by Phillips and Hansen (1990) and Stock and Watson (1993) were used. The choice of the models is justified on several grounds. As noted by Kalim and Shahbaz (2009), the FMOLS modifies the least squares to correct for the effects of serial correlation as well as the problem of endogeneity arising from the presence of long-run relationship. Also, as observed by Fereidouni et al. (2017), in small samples the FMOLS produces consistent parameters and handles measurement errors, bias arising from omitted variables and allows for the long-run heterogeneity in the parameters. On the other hand, Kurozumi and Hayakawa (2009) observed that the DOLS included the leads and lags in order to deal with both simultaneity and small sample bias. Even when there was endogeneity, the estimates of the DOLS were asymptotically efficient and unbiased.

Model Specification

The following baseline model that links the private sector credit to it determinants is a modification from Baoko et al. (2017):

$$LCRPRIV_t = \lambda_0 + \lambda_1 LBRESERV_t + \lambda_2 EXCHR_t + \lambda_3 FFR_t + \lambda_4 PLR_t + \lambda_5 LM2_t + \lambda_6 INFLR_t + \mu_t \quad (1)$$

where $LCRPRIV_t$ = log of private sector credit at time t, $LBRESERV_t$ = log of bank reserves at time t, $EXCHR_t$ = exchange rate at time t, FFR_t = US federal funds rate (a proxy for foreign interest rate) at time t, PLR_t = prime lending rate at time t, $LM2_t$ = log of broad money supply (a proxy for

money supply) at time t, $INFLR_t$ = inflation rate at time t and μ_t = error term. While the drift component of the model is λ_0, the model's parameters are λ_1 .. λ_6.

In specifying the cointegration models, this present study follows Adom et al. (2015). The following is the specification of the FMOLS estimator:

$$\psi FME = \left(\sum_{t=1}^{T} M_t M_t^t \right)^{-1} \left(\sum_{t=1}^{T} M_t N_t^t - T \begin{bmatrix} \eta^+ 12^{\cdot t} \\ 0 \end{bmatrix} \right) \tag{2}$$

where both N_t^t and $\eta^+ 12^{\cdot t}$ terms correct the serial correlation and endogeneity problems in the model.

The DOLS estimator is specified as follows:

$$y_t = \alpha + \beta x_t \sum_{i=-k}^{i=k} \delta_i \Delta x_{t+i} + \varepsilon_r \tag{3}$$

where α and β are intercept term and the long-run elasticity, respectively. The leads and the lags differences coefficients of I (1) independent variables are represented by the δ's term. As observed by Herzer et al. (2006), these coefficients are meant to correct the problem of autocorrelation, residuals that are not normally distributed and endogeneity that occur in the model.

Data and Sources/Justification

Monthly data that spanned the period from 2007M1 to 2021M12 was used to examine the determinants of private sector credit in Nigeria. Apart from the data on the US federal funds rate which was obtained from the Federal Bank of St Louis, data for other variables were obtained from the Central Bank of Nigeria Statistical Bulletin. Bureau De Change (BDC) exchange rate of domestic currency to the Dollars was used as a proxy for exchange rate, while prime lending rate and US federal funds rate were measured in percentage. Other variables such the private sector credit, M2 and bank reserves were measured in Billions of Naira. For the sake of normalisation, M2, bank reserves and private sector credit were logged.

Bank reserves are the amount of cash which the deposit money banks keep as required by the central bank and the central bank can influences the credit abilities of deposit money banks through manipulating it. The higher the bank reserves, the lower the ability of banks to offer credit to the private sector. Exchange rate is the rate at which a country's currency exchanges for other currencies. The appreciation of domestic currency usually leads banks to engage in foreign exchange transactions which generate more revenues to them than extend credits to the private sector. Thus, as domestic currency appreciates, it is expected that credit to the private sector will reduce. The federal fund rate is the rate that is exogenous to the domestic economy and it is thought to influence other rates internationally. The higher the federal fund rate in relation to the domestic interest rate, the higher the lower the propensity to extend credit to the private sector. This is because banks will prefer to channel their investment abroad to take advantage of the rise in foreign interest than to extend domestic credit. The prime lending rate is interest rate which banks charge their borrowers. If the prime lending rate rise, banks will be more willing to extend more credit to the private sector as such will generate more revenues to them. The broad money supply (M2) is defined as currencies and coins in circulation in the hands of the non-banking public and the demand deposit with commercial banks plus time and savings deposit. An increase in the broad money supply signifies that banks are having more liquidity and as can extend more credit to the private sector at reduced interest rate. During the period of rising inflation, money loses its value and banks are more willing to extend credit to the private sector. Also, rising inflation entails rise in interest rate which motivate banks to lend more to the private sector.

Research Results

This study first evaluated the behaviour of the variables used in the study starting with the descriptive statistics. Results in Table 1 indicate that the exchange rate has the highest mean with a mean of 245.74 and a standard deviation of 118.09. However, the US federal funds rate had the least mean of 0.95 and a standard deviation of 1.37. Findings also show that the mean and median of each variable are close which indicate that the series are symmetric. Also, the exchange rate was found to exhibit the highest volatility compared to other variables as it has the highest range of 276. However, with a range of 0.99, broad money supply has the lowest volatility.

Table1

Descriptive Statistics

	LCRPRIV	LBRESERV	INFLR	EXCHR	FFR	LM2	PLR
Mean	7.15	6.21	11.33	245.74	0.95	7.19	16.43
Median	7.21	6.49	11.58	169.85	0.18	7.22	16.65
Maximum	7.50	7.10	17.63	494.70	5.26	7.58	19.66
Minimum	6.36	4.98	5.40	118.70	0.05	6.59	11.13
Std. Dev.	0.24	0.55	2.95	118.09	1.37	0.22	1.64
Skewness	-1.02	-0.46	-0.01	0.65	1.90	-0.46	-1.27
Kurtosis	3.64	1.94	2.58	1.87	5.91	2.63	5.87
Jarque-Bera	32.82	14.28	1.25	21.22	164.72	7.24	105.65
Probability	0.00	0.00	0.53	0.00	0.00	0.02	0.00

Next the study discusses the results of unit root which was carried out to ensure the series do not produce spurious results. In Table 2, the ADF results show that at level, the private sector credit, the US federal funds rate and inflation rate are stationary (do not have unit root) at the 5% level, while others are not stationary (have unit root). That is to say that private sector credit, the US federal funds rate and inflation rate are integrated of order zero or I (0). On the other hand, after first differencing, all the variables became stationary which implies that they all became integrated of order one or I (1). Under PP, findings showed that while both the private sector credit and the US federal funds rate achieved stationarity at level at the 5%, broad money supply achieved stationarity at level 10%. When differenced once, all the series achieved stationarity.

Table 2

Unit Root Results

Variable	ADF		PP	
	Level	First Diff.	Level	First Diff.
LCRPRIV	-2.877(0.00)*	-2.877(0.00) *	-2.877(0.00) *	-2.877(0.00) *
EXCHR	-2.878(0.94)	-2.878(0.00) *	-2.878(0.95)	-2.878(0.00) *
FFR	-2.877(0.01) *	-2.877(0.00) *	-2.877(0.01) *	-2.877(0.00) *
INFLR	-2.877(0.00) *	-2.575(0.07) **	-2.877(0.44)	-2.877(0.03) *
LBRESERV	-2.877(0.40)	-2.877(0.00) *	-2.877(0.48)	-2.877(0.00) *
LM2	-2.877(0.11)	-2.877(0.00) *	-2.575(0.07) **	-2.877(0.00) *
PLR	-2.877(0.82)	-2.877(0.00) *	-2.877(0.71)	-2.877(0.00) *

Note. * and ** denote the rejection of the null of the presence of unit root at the 5% and10% levels of significant, respectively.

Having examined the unit root, the results indicated that the variables have a mixture of *I (0)* and *I (1)*. The implication is that the ARDL is appropriate in testing for the cointegration among the variables. In Table 3, the ARDL cointegration results revealed that the F-statistic with the value of 8.50 is greater than the upper critical bounds (3.61) at the 5% level of significant. It thus indicates that the series have a long-run relationship (are cointegrated).

Table 3

ARDL Cointegration Results

Test Statistic	**Value**	**K**
F-statistic	8.50	6
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

The outcomes of the determinants of the private sector credit are displayed in Table 4. Findings showed that in the two models, exchange rate impacted negatively and significantly on the private sector credit. A unit rise in exchange rate led to a marginal fall in credit to the private sector in both models. Also, in both models, the impact of the US federal funds was negative and significant. If the US federal funds rate rose by one percent, the credit to the private sector fall marginally. However, bank reserves, broad money supply and prime lending rate were all found to impact positively on the private sector credit in both models and the results were significant. The impact of broad money supply was greater compared to other variables which is an indication of the sensitive role money supply plays in the economy. The coefficient of determination (R^2) in the two models are 0.986 and 0.992 which means that the two models explain about 99% of the total variation in the private sector credit. The results of the post diagnostic test for both the FMOLS and DOLS models in appendixes i and ii reveal that the null hypothesis that the error terms are normally distributed cannot be rejected. This is because the p-values of the Jacques-Berra normality test are higher than the 5% level of significance, respectively.

Table 4

Results of FMOLS, PDOLS

	FMOLS			**DOLS**		
Variable	**Coeff.**	**t-Stat.**	**Prob.**	**Coeff.**	**t-Stat.**	**Prob.**
EXCHR	-0.0002	-2.112	0.036	-0.0003	-2.278	0.024
FFR	-0.015	-3.887	0.000	-0.010	-2.147	0.033
INFLR	0.002	1.024	0.307	0.005	1.974	0.050
LBRESERV	0.076	3.066	0.002	0.109	3.711	0.000
LM2	0.969	12.423	0.000	0.901	9.976	0.000
PLR	0.014	5.376	0.000	0.013	4.781	0.000
R^2	0.986	0.992				
AdjR^2	0.985	0.991				
Long-run variance	0.001	0.001				

Discussion

This sub-section discusses the results of the study based on the research questions raised above and their implications on the economy. First, the results indicated that in the two models, the exchange rate negatively and significantly impacted the private sector credit. This result finds support in the

finding by Al-Shammari and El-Sakka (2018) in a study in the OECD countries. The result follows the economic expectation. If there is appreciation of the domestic currency deposit money banks will find it more profitable to channel their funds to short-term foreign investment outlets such as foreign bonds. Apart from this, banks in Nigeria are known to engage in round-tripping to take advantage of the appreciated domestic currency. The parallel exchange rate market in existence in Nigeria does not help matters as the banks most times sell foreign currency to black market operators thereby gaining from the deals. So instead of extending the credit to the private sector and wait to gain from the interest payment on the loan, they will rather prefer to make short-term gain from foreign exchange deals. US federal funds rate was also shown to have negative impact on the private sector credit in both models. In support of the impact of external factors on domestic credit, a study in Ghana by Obeng-Amponsah (2021) revealed that the change in monetary situations abroad was found to impact on bank loans denominated in foreign currencies. The present study contends that the negative impact of foreign interest rate on the private sector credit in Nigeria is not out of place. If foreign interest rate represented by the US federal funds rate rises higher than the domestic interest rate, the tendency is for domestic financial institutions to give preference to investments abroad in order to gain from the rising foreign interest rate. Thus, the propensity to extend the credit to the domestic economy will reduce since the interest rate on such loans is going to be lower compared to the rate foreign investments will generate.

The findings showed that the inflation rate had a positive impact on the private sector credit in the two models. This result has empirical support in the study in Zambia by Funyina (2020). However, the finding is a departure from the result of a study in Tanzania by Ndanshau and Semu (2023) which revealed that inflation has a negative impact on credit to the private sector. This present study contends that the positive impact of inflation rate on the private sector credit in Nigeria is justified on several grounds. First, during period of inflation, money supply is usually high (which off course is the major factor that drives inflation) and this leads to liquidity build-up in the banks. So, with such high liquidity position, banks will be more willing to extend loans to the economy. Second, in periods of rising inflation, businesses tend to experience boom which implies that borrowed funds can easy be repaid. Such willingness to repay loans will motivate the lending institutions to extend more credits to the economy.

The positive influence of bank reserves and the broad money supply on the private sector credit as revealed in the present study aligns with the above stand. Rising money supply increases the reserve position of banks, and hence their propensity to extend more loans. In periods of rising oil price, the CBN usually intervenes to curtail the monetary impact of such phenomenon on the economy, especially its inflationary impact. Such intervention is usually targeted at the reserves of the deposit money banks with the intention to lower their ability to extend credit to the economy. The positive impact of broad money supply on domestic credit finds empirical support in a study in Bangladesh by Islam (2022) which found stability in money supply to be among the main determinants of private sector credit. A study by Pakasa et al. (2023) for Malaysia also supports the finding. With respect to the positive impact of bank reserves on domestic credit, findings by Funyina (2020) for Malaysia support the result of the present study. Finally, the present study revealed that the prime lending rate positively impacted on private sector credit. This finding does not align with the policy objective of the monetary authorities whose intension of raising the benchmark rate during the period of rising money supply is to curtail bank lending in order to maintain price stability. However, the study is of the view that if by any reason lending rate rises, particularly if the benchmark rate (monetary policy rate) is raised, such will motivate banks to lend more since they will make much profit through such activity. It is worthy of note to state that the major attraction for banks to grant short-term loans is usually to take advantage of any short-term spike in interest rate. In Bangladesh, Islam (2022) found that increase in real interest rate was among the major determinants of domestic credit to the private sector.

In the second research question, the result of the finding indicated that the series had a long-run relationship which implied that the study could not accept the null hypothesis of an absence of

cointegration among the variables. The implication of this result was that the series moved together in the ling-run. This result finds support in a study in Bangladesh by Islam (2022).

Conclusions and Implications

The role of domestic credit in stimulating the economy provided the motivation for this study. This study improves the past studies lacks by considering both domestic and exogenous factors that influence domestic credit in Nigeria, as well as using models that handle measurement errors and which also allows for long-run heterogeneity. The study used monthly series in order to examine the determinants of private sector in Nigeria. The findings of the study are as follows:

- In the two models, the exchange rate negatively and significantly impacted on the private sector credit.
- In both models, the impact of the US federal funds on credit to the private sector was negative and significant.
- Bank reserves, broad money supply and prime lending rate were all found to positively impact on the private sector credit in both models and the results were significant.

The conclusions of the study based on the findings are that domestic currency appreciation and rising foreign interest rate reduced the extent to which financial institutions extended the credit to the private sector in Nigeria. However, increased money supply with its attendant reserve build-up and inflationary pressure the spur credit extension to the private sector within the study period. The policy implications arising from the findings are as follows: In an attempt to boost domestic credit in Nigeria, monetary authorities usually encounter trade-off in implementing policies to this effect. For instance, if measures are put in place to devalue the domestic currency as a way to improve credit extension, such policy will lead to a massive importation which tends to result in negative balance of payments. In another vein, money supply and bank reserves cannot be allowed to continue rising as a way to boost domestic credit because of their tendency to raise the price level, thus defeating the CBN's objective of price stability. This study was therefore of the view that a right balance should be sought between boosting domestic credit provision and achieving macroeconomic objectives of price and exchange rate stability. Consequently, it is the contention of the study that fiscal measures should be aligned with monetary policy measures in order to rein inflation through increased productivity and also achieve a realistic exchange rate. This will reduce the pressure on the monetary authorities to boost domestic credit on one hand and on the other hand will struggle to maintain both the price and the exchange rate stability.

Suggestions for Future Research

The study suggests that future studies should focus mainly on the impact of the various policies put in place in order to foster credit to the private sector in Nigeria. In Nigeria, several policies have been put in place over the years to address the challenges encountered by the private sector in sourcing funds. The impact of these policies in enhancing credit extension to this sector has to be examined. Secondly, future studies should focus on examining the impact of none performing loans and lack of collateral on credit provision in Nigeria. The issue of none performing loans has always discouraged financial institutions from granting loans to some categories of business whose credit worthiness is not guaranteed. Also, most businesses in Nigeria lack the requisite collateral that should be tendered for loan demand. Such study should be able to examine in particular the constraints faced by the critical sectors of the economy in accessing domestic credit. In addition to this, future studies should focus on examining the crowding out effect of government domestic borrowing on the private sector credit. The main source of revenue to the country is the oil sector. Each time the international price of oil falls; this will have a ripple effect on the revenue projection of the government, thus warranting it to borrow from both internally and externally. Internal borrowing mainly affects the supply of credit to the economy as the private sector competes with the government. Such practice often affects the ability of local

businesses to borrow from the same market. Finally, future studies should carry out comparative studies of the policies implemented to address domestic credit challenges across the countries in Africa. The essence of such study is to identify the countries whose policies are effective in addressing these challenges such that the government can learn from them.

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Conflict of Interest

None.

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References

Adom, P. K., Amakye, K., Barnor, C., & Quartey, G. (2015). The long-run impact of idiosyncratic and common shocks on industry output in Ghana. *OPEC Energy Review, 39*(1), 17–52. https://doi.org/10.1111/opec.12039

Al-Shammari, N., & El-Sakka, M. (2018). Macroeconomic determinants of credit growth in OECD countries. *International Journal of Business, 23*(3), 218–334. https://ijb.cyut.edu.tw/var/file/10/1010/img/864/V233-1.pdf

Akani, H. W. & Onyema, J. I. (2017). Determinants of credit growth in Nigeria: A multi-dimensional analysis. *Journal of Economics and Sustainable Development, 8*(20), 201–215. https://core.ac.uk/download/pdf/234648048.pdf

Aryestya, R., & Marta, J. (2022). Non-linear impact of domestic credit on economic growth in Southeast Asia countries. In *Proceedings of the Eighth Padang International conference on economics education, economics, business and management, accounting and entrepreneurship (PICEEBA-8 2021)* (pp. 511–520). Atlantis Press. https://www.atlantis-press.com/proceedings/piceeba-8-21/125976388

Asiamah, T. A., Steel W. F., & Ackah, C. (2021). Determinants of credit demand and credit constraints among households in Ghana. *Heliyon, 7*(10), Article e08162. https://doi.org/10.1016/j.heliyon.2021.e08162

Baoko, G., Acheampong, I. A., & Ibrahim, M. (2017). Determinants of bank credit in Ghana: A bounds-testing cointegration approach. *African Review of Economics and Finance, 9*(1), 33–61. https://hdl.handle.net/10520/EJC-716ab5833

Berger, A. N. (1995). The profit-structure relationship in banking – tests of market-power and efficiency-structure hypotheses. *Journal of Money, Credit and Banking, 27*, 404–431. https://doi.org/10.2307/2077876

Bernanke, B. S., & Gertler, M. (1995). Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic Perspectives, 9*(4), 27–48. https://doi.org/10.1257/jep.9.4.27

Cheong, D., & Boodoo, E. (2008). The monetary transmission mechanism: A closer look at the interest rate channel in Trinidad and Tobago. In *29th Annual review seminar research department Central Bank of Barbados*. Central Bank of Trinidad and Tobago. https://www.centralbank.org.bb/viewPDF/documents/2022-02-10-05-49-12-MonetaryTransmissionMechanismACloserLookattheInterestRateChanneinTT.pdf

Colombo, V., & Paccagnini, A. (2020). Does the credit supply shock have asymmetric effects on macroeconomic variables?. *Economics Letters, 188*, Article 108958. https://doi.org/10.1016/j.econlet.2020.108958

Danthine, J. P., & Donaldson, J. B. (2005). *Intermediate Financial Theory* (2nd ed.). Elsevier Academic Press.

Disyatat, P. (2011). The bank lending channel revisited. *Journal of Money, Credit and Banking, 43*(4), 711–734. https://doi.org/10.1111/j.1538-4616.2011.00394.x

Ejokor, L,, Konboye, J. & Nteegah, A. (2016). Banking sector capitalization and deposit money bank's profitability in Nigeria. *International Journal of Social Sciences and Management, 3*(3), 203–213. https://pdfs.semanticscholar.org/41e9/632ec68ef5f905261c16c67eae8a15767b42.pdf

Eseyin, O, S., Adama, I. J., Olopade, B. C., Ogbaro, E. O., Ahmed, A. V., & Suleiman, Z. O. (2022). Determinants of private sector credit and its implication on job creation in Nigeria (1984–2020). *African Journal of Business and Economic Development, 2*(12), 78–116. https://www.ijaar.org/articles/ajbed/v2n12/ajbed2125.pdf

Fereidouni, H. G., Al-mulalia, U., & Mohammed, M. A. H. (2017). Wealth effect from real estate and outbound travel demand: The Malaysian case. *Current Issues in Tourism, 20*(1), 68–79. https://doi.org/10.1080/13683500.2014.882886

Frimpong, J. M., & Marbuah, G. (2010). The determinants of private sector investment in Ghana: An ARDL approach*. European Journal of Social Sciences, 15*(2), 250–261.

Funyina, T. K. (2020). *Determinants of bank credit to the private sector in Zambia*. Bank of Zambia. https://www.boz.zm/Determinants_of_Bank_Credit_to_the_Private_Sector_in_Zambia.pdf

Gbenga, O., James, S. O., & Adeyinka, A. J. (2019). Determinant of private sector credit and its implication on economic growth in Nigeria: 2000-2017. *American Economic and Social Review, 5*(1), 10–20. https://doi.org/10.46281/aesr.v5i1.242

Ghosh, S. (2010). Credit growth, bank soundness and financial fragility: Evidence from Indian banking sector. *South Asia Economic Journal, 11*(1), 69–98. https://doi.org/10.1177/139156141001100105

Gozgor, G. (2013). Determinants of domestic credit levels in emerging markets: The role of external factors. *Emerging Markets Review, 18*, 1–18. https://doi.org/10.1016/j.ememar.2013.11.003

Hahn, L. A. (2015). *Economic theory of bank credit*. Oxford University Press.

Herzer, D., Nowak-Lehmann, D. F., & Siliverstovs, B. (2006). Export-led growth in Chile: Assessing the role of export composition in productivity growth. *The Developing Economies, 44*(3), 306–328. https://doi.org/10.1111/j.1746-1049.2006.00019.x

Hurlin, C., & Kierzenkowski, R. (2002). *A theoretical and empirical assessment of the bank lending channel and loan market disequilibrium in Poland*. National Bank of Poland. https://static.nbp.pl/publikacje/materialy-i-studia/22_en.pdf

Islam, D. (2022). Determinants of domestic bank credit to private sectors in Bangladesh: An empirical investigation. *Journal of Economic Impact, 4*(2), 65–74. https://doi.org/10.52223/jei4022208

Kalim, R., & Shahbaz, M. (2009). Remittances and poverty nexus: Evidence from Pakistan. *International Research Journal of Finance and Economics, 29*, 46–58. http://hdl.handle.net/123456789/285

Kasingu, S., Sabok, G., Tuam, D., Hamua, J. Su, J., & Sharma, P. (2020). *Determinants of private sector credit in Papua New Guinea*. Griffith Asia Institute. https://www.griffith.edu.au/__data/assets/pdf_file/0024/945240/JPRWP11-web.pdf

Kashyap, A., & J. Stein (1995). The impact of monetary policy on bank balance sheets. *Carnegie-Rochester conference series on public policy, 42*, 151–195. https://doi.org/10.1016/0167-2231(95)00032-U

Kurozumi, E., & Hayakawa, K. (2009). Asymptotic properties of the efficient estimators for cointegrating regression models with serially dependent errors. *Journal of Econometrics, 149*(2), 118–135. https://doi.org/10.1016/j.jeconom.2008.11.003

Levine, R. (2005). Finance and growth: Theory and evidence. In P. Aghion & S. N. Durlauf (Eds.), *Handbook of economic growth* (Vol. 1, Part A, pp. 865–934). Elsevier. https://doi.org/10.1016/S1574-0684(05)01012-9

McKinnon, R. I. (1973). *Money and capital in economic development*. Brookings Institution Press.

Miller, M. H. (1998). Financial markets and economic growth. *Journal of Applied Corporate Finance, 11*(3), 8-15. https://doi.org/10.1111/j.1745-6622.1998.tb00498.x

Nampewo, D., Tinyinondi, G. A., Kawooya, D. R., & Ssonko, G. W. (2016). Determinants of private sector credit in Uganda: The role of mobile money. *Financial Innovation, 2*(13). https://doi.org/10.1186/s40854-016-0033-x

Ndanshau, M. O., & Semu, A. M. (2023). Determinants of bank credit supply to the private sector in Tanzania. *African Journal of Economic Review, 11*(2), 92–115. https://www.ajol.info/index.php/ajer/article/view/244580

Nzeh, I. C., Uzoechina, B. I., Eze, M. A., Imoagwu, C. P., & Ozoh, J. N. (2022). Private sector credit provision in periods of fluctuating capital inflows in Nigeria: Does each regime change influence credit provision differently?. *International Journal of Research and Innovation in Social Science, 6*(1), 98–113. https://dx.doi.org/10.47772/IJRISS.2022.6112

Obeng-Amponsah, W., Sun, Z., Bimaruci, H., & Havidz, H. (2019). Determinants of domestic credit to the private sector in Ghana: Application of vector auto-regressive method. In Q. Zhang, Z. Liu, & J. Su (Eds.), *Proceedings of The first international symposium on management and social sciences (ISMSS 2019)* (pp. 132–139). Atlantis Press. https://doi.org/10.2991/ismss-19.2019.28

Okere, C., & Ugonma, N. (2020). Effects of bank credits on the manufacturing sector output in Nigeria (1981-2018). *International Journal of Science and Management Studies (IJSMS), 3*(4), 74–82. https://doi.org/10.51386/25815946/ijsms-v3i4p108

Olweny, T., & Shipho, T. M. (2011). Effects of banking sectoral factors on the profitability of commercial banks in Kenya. *Economics and Finance Review, 1*(5), 1–30.

Ozili, P. K., & Ndah, H. (2021). *Impact of financial development on bank profitability* [Preprint]. Journal of Economic and Administrative Sciences. https://doi.org/10.1108/JEAS-07-2021-0140

Ozili, P. K., Oladipo, O., & Iorember, P. T. (2023). *Effect of abnormal increase in credit supply on economic growth in Nigeria* [Preprint]. African Journal of Economic and Management Studies. https://doi.org/10.1108/AJEMS-02-2022-0036

Pakasa, U. I., Yacob, Y., Jelihi, N. A., Ali, J. K., & Andrew, L. (2023). Influencing domestic credit to private sector in Malaysia: Application of vector auto-regressive method. *International Journal of Academic Research in Accounting, Finance and Management Sciences, 13*(1), 283–297. http://dx.doi.org/10.6007/IJARAFMS/v13-i1/16315

Phillips, P. C. B., & Hansen, B. (1990). Statistical inference in instrumental variables regression with I(1) processes. *The Review of Economic Studies, 57*, 99–125. https://doi.org/10.2307/2297545

Shijaku, G., & Kalluci, I. (2013). *Determinants of bank credit to the private sector: The case of Albania*. Bank of Albania. https://mpra.ub.uni-muenchen.de/79092/

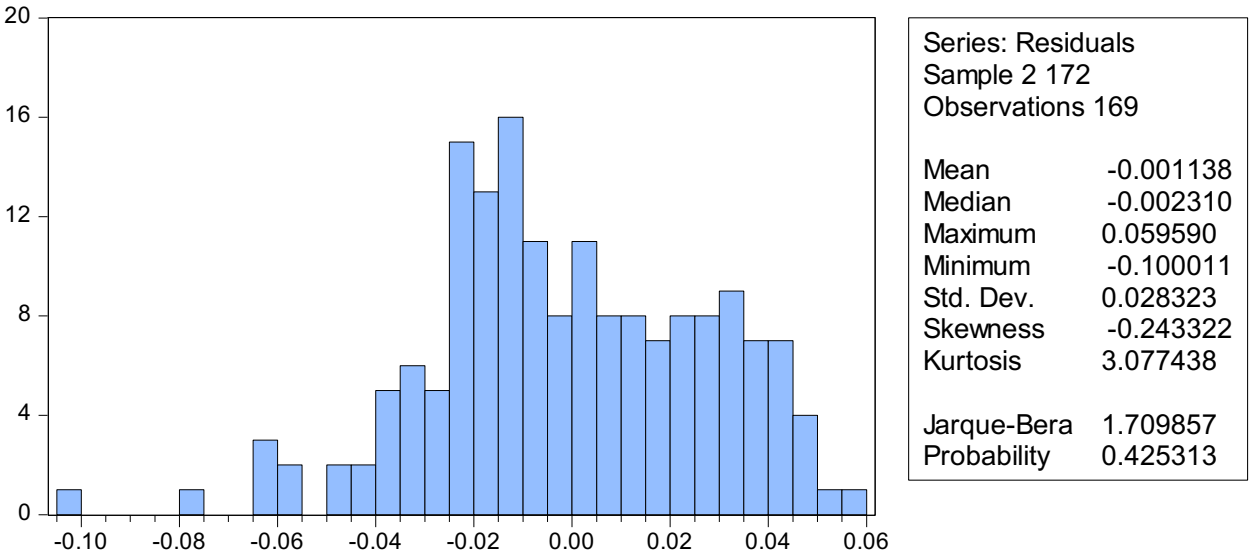
Sogules, I. W. & Nkoro, E. (2016). Bank credits and performance of manufacturing sector in Nigeria, 1970-2013. *The Journal of Social Sciences Research, 2*(7), 129–132. https://ideas.repec.org/a/arp/tjssrr/2016p129-132.html

Stiglitz, J. (2018). The theory of credit and macroeconomic stability. In A. G. Dastidar, R. Malhotra, & V. Suneja, *Economic theory and policy amidst global discontent* (pp. 127–183). Routledge India.

Stock, J. H., & Watson, M. W. (1993). A simple estimator of cointegrating vectors in higher order integrated systems. *Econometrica, 61*(4), 783–820. https://doi.org/10.2307/2951763

Appendix A

Normality Result of FMOLS Model



Appendix B

Normality Result of DOLS Model