Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.13, No.7, 2022

Government Domestic Borrowing and Private Credit in Nigeria: Testing the Lazy Bank Hypothesis

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Abstract
This study investigates the effect of government public domestic borrowing on credit to the private sector in applying the lazy bank model in Nigeria. The study utilises the Central Bank of Nigeria data covering the period between 1980 and 2019 and deploys the Autoregressive distributed lag (ARDL) model for analysis. The study results show that domestic government borrowing has the most dominant effect on credit to the private sector in a negative and significant impact. Also, the effect of interest rate and inflation are negative and significant on the credit to the private sector. However, the effect of real GDP on credit to the private sector is minimal and positive. The strong negative effect of domestic government borrowing confirms the application of the lazy bank hypothesis in Nigeria. In addition, the negative effect of interest rate suggests that the crowding-out hypothesis applies in Nigeria. Therefore, the study recommends that the government reduces borrowing from the banking sector and implement coordinated macroeconomic policies to minimise the adverse fluctuations in interest rate and inflation while taking concrete steps to ensure that more credit is available to the private sector.
Keywords: Government Domestic Borrowing, Credit to the Private Sector, Domestic Financial Markets, Lazy Banks, Crowding Out.
JEL Codes: E52, H63, G21
DOI: 10.7176/JESD/13-7-07
Publication date: April 30th 2022

1.0 Introduction

Government spending plays an essential role in the banking system and the economic growth of a country. The public sector often exercises direct and indirect influence over banks' business through decisions on government spending and outright ownership. The broad objectives are usually to achieve public policy goals such as the implementation of monetary policy objectives the channelling of funds to vulnerable economic sectors or borrowers with limited access to credit. Developing countries often turn to internal and external sources to fund budget deficits in the face of declining revenues from tax sources. Many developing countries resorted to borrowing from the internal financial markets in the 1980s due to the numerous problems encountered while borrowing from foreign sources (Edo et al., 2020). However, persistent and sustained large ticket government borrowing from the domestic financial markets often trigger an adverse response from interest rate and become associated with the crowding out of the private sector and the lazy bank hypothesis in these countries (Shetta & Kamaly, 2014).

An effective and efficient financial system is imperative for developing and improving welfare in the modern competitive and fast-changing world. With a rapidly evolving economy, Nigeria also seeks ways through which the financial system can improve the economy and the welfare of its people. In supporting the public sector government to finance fiscal deficits, the local financial markets have improved in advancing credit to the government to execute the budgetary programmes. In recent times, the Nigerian government has deployed several financial instruments to borrow heavily short term and long term funds from the local financial markets like treasury bills, treasury certificates, treasury bonds, development stock, FGN bonds, promissory notes, sukuk bonds, green bonds and savings bonds. As a result, internal government borrowing in Nigeria in 1981 increased from N11.02 billion to N116.2 billion in 1991 (A more than 1000% increase). After that, it grew to N1.02 trillion in 2001 and N5.62 trillion in 2011. Between 2011 and 2019, domestic government borrowing has more than doubled to N14.27 trillion (CBN, 2020).

When the liquidity in the banking system is high, the government may borrow heavily from the internal markets without adversely affecting the other parties that also seek credit from the markets. However, suppose the liquidity in the banking system is limited. In that case, heavy government borrowing may cause a reduction in the credit that is available to the private sector and possibly affect the stability of the banking system. Since the functioning of the private sector is pertinent to the adequate welfare of the economy, the subject matter of crowding out of credit to the private sector raises serious concerns for the banking system and policymakers of the country. The government of a country may borrow from the domestic financial markets for several reasons. The first is to raise money to execute fiscal deficit projects when the revenue from tax collections becomes

inadequate. The inadequacy of taxes is more prevalent in developing countries because of the large and grossly undervalued informal sector with strong notoriety and minimal penalty for the non-payment of legal taxes (Bahl & Bird, 2018). The second is to implement monetary policy and regulate the liquidity in the economy. The third reason is to consciously develop the internal financial markets by providing safe assets to extend credit to other borrowers in the system.

Since the government of Nigeria paid down a large portion of foreign debt in 2006, the government has borrowed heavily from the internal financial markets. Accordingly, Abiodun (2020) has argued that persistent borrowing to the public sector from internal sources could lead to problems with interest rate and inflation. Also, the increase in domestic government borrowing can worsen the current account deficit problem by stimulating domestic absorption (Mahuni, 2017). Another problem that has been associated with persistent public sector borrowing from the local markets is the reduction in the available credit to the private sector (Mun & Ismail, 2015). Lending to the public sector is much more beneficial to the banker in terms of risk-return assessment objective and rational investors; the bankers are more willing to lend to the government based on the very attractive returns than the riskier private sector investment projects. However, since the loanable funds that are available in the market are often limited, government borrowing adversely affects the market interest rate and crowds out the credit to the private sector as the banker becomes lazy in meeting the credit fund requirements of the private sector.

Since the Nigerian government has started to borrow heavily for the internal financial markets (and has maintained the heavy tempo), it has become essential to examining the effect of such borrowing on the banker's activities and the private sector investors in the economy. Also, as the private sector constitutes the heart-beat of investment in the real sector of the economy and hence the drivers of the country's growth and investment, it is vital to carefully underscore the effect of government borrowing actions and the banker's response on their investment decisions in the economy. The objective is to make recommendations on improving the market performance of private investment and reducing the negative effect of government borrowing actions.

The rest of the study is organised as follows. The second section reviews the relevant empirical and theoretical literature on the subject matter. Section three is devoted to the theoretical framework and methodology of the study. Section four covers the presentation of the study's empirical results, while section five presents the conclusions and recommendations.

2.0 Review of Empirical Literature

The interaction between fiscal deficit and financial development has not been fully explored in the literature (Kutivadze, 2011). The effort by governments in developing countries to generate funding for fiscal deficit has been hampered because of the weak depth that characterises the existing financial markets (Agbélénko & Kibet, 2015). The first set of studies suggests that the growth of domestic government borrowing from the local financial markets can have an adverse effect on financial development by reducing the credit to the private sector in a 'lazy bank model'. The proponents of this position argue that an increase in domestic borrowing stimulates competition for loanable funds, increases the interest rate, crowd out private sector credit, and destabilises the banking system. More specifically, the writers in this category argue that when the public sector government borrows money from the internal banks in an economy, it crowds out the private sector, i.e. reduces the credit to the private sector (Hauner, 2009; Emran & Farazi, 2009; Hwang & Chien, 2011; Basti & Köksal, 2011; Altayligil & Akkay, 2013; Mun & Ismail, 2015; Fatih & Ilgun, 2016; Saibu & Alenoghena, 2017, Abiodun, 2020; Aljanabi, 2020). Since private investment is significant to the growth and development of the nation, the crowding out of credit to the private sector could adversely affect the country's growth and development.

On the other hand, several other authors contend that the growth in government borrowing from the local financial markets improves the credit accessibility for the credit to the private sector and hence, have a positive effect on financial development in a 'safe asset model' (Maana et al., 2008; Kutivadze, 2011; Raza et al., 2014; Mbulawa, 2015; Akindipe, 2018; Omodero, 2019). Hauner (2009) provides the "safe asset" argument of bank lending in advancing this argument. Safe assets refer to a healthy collateralised riskless credit facility extended to government borrowing, which improves the bank's profitability and liquidity. In a risk diversification framework, safe asset lending provides the benchmark for the bank to further extend credit facilities to the more risky private sector.

The existing gap in this study stems from the empirical research on the Nigerian economy conducted by Akindipe (2018). The study examines the relationship between public debt and financial development. He found that public debt improved financial development. However, he uses public debt as the explanatory variable to credit the private sector, the dependent variable. Therefore, domestic government borrowing from the internal markets should be adopted as the explanatory variable against credit to the private sector as the dependent variable (Mun & Ismail, 2015) to achieve the effect of government borrowing on credit to the private sector (the lazy bank hypothesis). In another study, Omodero (2019) investigates the effect of domestic government borrowing on credit to the private sector and found that government borrowing positively impacts the credit to

the private sector. Still, the methodological approach to data analysis of Omodero (2019) may be fundamentally flawed. First, the study has a scope (1988 – 2018, 20 annual observations) which is too small for a time series analysis and second, they adopted the basic ordinary least squares (multiple regression) for the analysis of data with the unit root of first difference [I(1)] for stationarity.

3.0 Theoretical Framework and Methodology

3.1 Theoretical Framework

The several theories examined in this section articulate the relationship between fiscal deficit and financial development:

The Real Activity Theory: The real activity theory links fiscal deficit, money supply and stock market prices (Maskay, 2007). The proponents of this theory argue that fiscal deficit increases the money supply in the economy. The positive money supply shock leads to an increase in financial market instruments and stock prices. The theory maintains that output expectations often cause money supply changes that provide information on money demand trends. Therefore, with a rise in money supply, the demand for money increases to signal an increase in the volume of economic activity. Equally, stock prices and financial market instruments may rise in value based on higher cash flow premised on the rise in the level of economic activity. Accordingly, Bernanke & Kuttner (2005) posit that the market price summarises the risk associated with holding the stock and the inherent monetary value. Consequently, if the perceived risk associated with a particular stock is high, the stock becomes unattractive. Hence, perceived risk and monetary value constitute the vehicle through which money supply affects the stock market. In addition, the current interest rate, which is a function of the money supply, can determine the monetary value of a stock. Therefore, the real activity theory authors conclude that money supply in the economy should be tightened to raise the interest rate. With a rise in interest rate, the discount rate would also increase, causing the value of the stock to fall (Bernanke & Kuttner, 2005).

The Market Discipline Hypothesis: The market discipline hypothesis analyses the behaviour of the local debt market as the government funds fiscal deficits internally. The hypothesis suggests that the debt market responds to fiscal deficits by increasing the default risk premium on sovereign governments. As a result, sovereign government borrowers respond to increased yields by making fiscal adjustments. Bulut (2012) suggests that financial markets have a disciplinary effect on sovereign governments. The latter are more disciplined in countries with floating exchange rate regimes, while countries with fixed exchange rate regimes seem irresponsible in changing the market's default risk premium. Overall, markets seem to respond to changes in fiscal indicators as expected of well-functioning financial markets. Several other authors present another version of the hypothesis (Levy-Yeyati et al., 2012). They opine that financial market stakeholders (depositors, bondholders and stockholders) might move against (disinvest from) certain financial market institutions that may become unnecessarily reckless in unduly lending money to the government. The perception is that the institutions may have compromised their basic (risk) survival fundamentals. When extended to several financial market institutions by stakeholders at one particular time, such market discipline conduct may elicit severe runs on the institutions. It could trigger eventual systemic risk on the nation's financial system.

The Lazy Bank Hypothesis: Hauner (2009) developed the concept of "lazy banks" in explaining the behaviour of the banker's response to the risky private sector lending in the face of a continuous increase in government borrowing. The classical approach to banking contends that banks are profit-oriented private investments whose decisions guide risk-return characteristics of the various assets and liabilities in their investment portfolio. (Shetta & Kamaly, 2014). Accordingly, banks' response to government increased borrowing depends on the level of liquidity in the economy at the point in time. In the period of excess bank liquidity, domestic public borrowing from banks plays a positive role in the development of the financial market by providing the "safe asset", which serves as the benchmark for the banker to lend to the riskier private sector loans in a "risk diversification model". However, when there is limited bank liquidity and the "safe asset" model is not required, the sustained increase in government public sector borrowing from the local banks would shift the portfolio of the lending banks against the relatively riskier private sector loans. Hence, it reduces the opportunity for new profitable ventures in the private sector in the "lazy bank model". Therefore, the lazy bank hypothesis recognises that increasing public sector borrowing to finance fiscal deficit during periods of limited liquidity would stimulate competition for available loanable funds in the banking system. The ensuing competition makes the banks alter their balance sheets favouring government public sector lending increasing lending rates. As a result, there is further demand for loanable funds by the government public sector coupled with the increased interest rate, and there is a reduction in the lending to the private sector. Limited liquidity often characterises the financial markets in developing countries occasioned by the poor level of market depth, government public sector borrowing from the internal banks in the system often crowds out the amount of credit to the private sector in line with the lazy bank hypothesis (Shetta & Kamaly, 2014).

The Crowding Out Hypothesis: This neo-classical theory holds that massive fiscal deficits create an excess supply of government borrowing, leading to higher real interest rates. When governments borrow extensively

from the local financial markets, the resulting pressures often result in a higher interest rate, slowing down private investment activity (Hasnat & Ashraf, 2018). Therefore, neo-classical economists argue that government spending through persistent borrowing from the domestic financial markets could crowd out private sector investment. However, some factors may weaken the link between fiscal deficits and interest rates. The public authority accumulates resources by borrowing, leaving the private sector with less. Accordingly, as public expenditure is less efficient and less productive than private sector expenditure, the increase in bank loan-funded government expenditure may not fully offset the adverse effect of the crowding-out of private investment on production. Therefore, it results in a drop in overall national productivity (Ouédraogo et al., 2019).

The crowding-out argument is premised on the assumption that the economy is operating at the point of PPF (production possibility frontier), indicating well-developed and efficiently functioning markets. However, most developing countries do not fulfil these conditions. The theory also records that interest rates may not respond to increased government borrowing if the economy operates in the region with massive liquidity. Another weakness of the approach is that capital inflows may complement domestic savings in an open economy for some time by leading to real exchange rate appreciation. In such a situation, interest rates may not increase.

3.2 The Model

The model adopted in this paper follows Ismihan & Ozhan (2012) and Mun and Ismail (2015). The model expresses credit to the private sector (PCRED) as the dependent variable and central government domestic borrowing (DDEBT), real GDP (RGDP), interest rate (INTR) and inflation (INFL) as the explanatory variables. The variables are shown in equation (1) as follows:

PCRED = (DDEBT, RGDP, INTR, INFL) - - - - - (1)

Equation (1) can be further expressed in the functional form:

$PCRED_t = \beta_0.(DDEBT_{1t})^{\beta_1}.(RGDP_{2t})^{\beta_2}.(INTR_{3t})^{\beta_3}.(INFL_{4t})^{\beta_4}$ - - - (2)

Equation 2 has to be log-linearised for the purpose of estimation. This is necessary to streamline the scales of the variables to minimise fluctuations in the data. Therefore:

$LnPCRED_t = \beta_0 + \beta_1 LnDDEBT_{1t} + \beta_2 LnRGDP_{2t} + \beta_3 LnINTR_{3t} + \beta_4 LnINFL_{4t} + \mu_t$ - - (3)

Where $\beta_0, \beta_1, \beta_2, \beta_3$ & β_4 are the coefficients to be estimated and $\mu_t$is the stochastic error term.

Furthermore, the apriori expected signs of the coefficients are $\beta_1 > 0, \beta_2 > 0, \beta_3 < 0$ & $\beta_4 < 0$. Therefore, the parameter $\beta_{'s} > 0$ implies a positive relationship between the dependent and independent variables. Also, $\beta_{'3} < 0$ means a negative relationship between the dependent and independent variables.

3.3 The Methodology

The Autoregressive Distributed Lag (ARDL) Bound Testing for Cointegration

This paper utilises the Autoregressive Distributed Lag (ARDL) Bound Testing Cointegration Technique to estimate the equations that require regression analysis. Pesaran et al. (2001) show that the OLS estimators of the short-run parameters are consistent and the ARDL based estimators of the long-run coefficients are super-consistent in small sample sizes. Hence, once the standard errors have been adjusted, the normal asymptotic theory helps make valid inferences on the long-run parameters. The ARDL approach yields consistent and asymptotically average estimates for the long-run coefficients regardless of whether the underlying variables are I(0) or I(1). Hence, this approach allows for the specification of a combination of stationary and non-stationary variables. The ARDL cointegration technique has been adopted for this study for the following reasons:

First, the ARDL technique can effectively handle the analysis of the relationship between variables whether the order of integration underlying the regressors can turn out to be stationary at level [I(0)] or stationary at first difference [I(1)] or the combination of both properties. Second, the ARDL model can be deployed to effectively handle a purely short term sample situation where the variables have no long term cointegrating relationship. Third, the ARDL model provides robust results for both the long run and short-run relationships simultaneously without losing any long run information.

Since the macroeconomic variables included in the study are assumed to be non-stationary and may reflect a spurious regression, a unit root test would be conducted before implementing the ARDL bound cointegration testing procedure. Although the ARDL model does not require the stationarity pre-test on the variables, the unit root test is essential to ascertain that the order of integration for the variables does not exceed I(1).

The ARDL Model

In estimating the ARDL model, the variables should be specified in the order to express the long run and the short run relationships as follows:

$$\Delta LNPCRED_t = \alpha_0 + \beta_{11} LNDDEBT_{t-1} + \beta_{21} LNRGDP_{t-1} + \beta_{31} LNINTR_{t-1} + \beta_{41} LNINFL_{t-1} + \sum_{i=0}^{P} \lambda_{1i} \Delta LNPCRED_{t-1} + \sum_{i=0}^{P} \lambda_{2i} \Delta LNDDEBT_{t-1} + \sum_{i=0}^{P} \lambda_{3i} \Delta LNRGDP_{t-1} + \sum_{i=0}^{P} \lambda_{4i} \Delta LNINTR_{t-1}$$

$$+\sum_{i=0}^{P}\lambda_{5i}\,\Delta LNINFL_{t-1}+\mathcal{E}_{1t}- \quad - \quad (4)$$

Where Δ is the difference operator and α_0 represent the drift component. The coefficients $(\beta_{11}-\beta_{41})$ expresses the long-run relationship. At the same time the part with the summation sign $(\lambda_{1i}-\lambda_{5i})$ shows the short-run dynamics of the model, and $\mathcal{E}_{1t}$ is the serially uncorrelated disturbance term with zero mean and constant variance.

The ARDL approach adopts the bound test to confirm the existence of a long-run cointegrating relationship among the variables developed by Pesaran et al. (2001). The test is based on the F-statistic value of the Wald test using a non-standard distribution. Suppose the value of the calculated F-statistic is lower than the bound critical value based on the desired level of significance. In that case, there is acceptance of the null hypothesis of no cointegration among the variables $(\lambda_{1i}=\lambda_{2i}=\lambda_{3i}=\lambda_{4i}=0)$. Conversely, suppose the calculated F-statistic from the Wald test is greater than the upper bound critical value from the Pesaran et al. (2001) table. In that case, the null hypothesis is rejected, concluding that a long-run cointegrating relationship exists among the variables. However, suppose the value of the computed F-statistic lies within the lower and upper bounds of the critical table value. In that case, the decision of whether the variables have a long-run cointegrating relationship becomes inconclusive.

When the variables have no long-run cointegrating relationship, the investigation ends with the ARDL test for short-run analysis. The long-run model is estimated after establishing the existence of cointegration between the variables as follows:

$$LNPCRED_t=\beta_{11}LNDDEBT_{t-1}+\beta_{21}LNRGDP_{t-1}+\beta_{31}LNINTR_{t-1}+\beta_{41}LNINFL_{t-1}+\mathcal{E}_{2t}- \quad - \quad (5)$$

Where: $\beta_{11}to\,\beta_{41}$ are the long-run parameters, and $\mathcal{E}_{2t}$ is the long-run stochastic error term.

The next step is to determine the optimal lag structure by choosing the lag for each variable in a VAR setting using the appropriate specification by Akaike Information Criteria (AIC) or Schwarz Criteria (SC). This is followed by estimating the ARDL (m, n, o, p, q) and the associated long-run multipliers. After that, the error correction model is estimated to arrive at the short-run coefficients and dynamics of the model:

$$\Delta LNPCRED_t=\alpha_0+\sum_{i=0}^{P}\lambda_{1i}\,\Delta LNPCRED_{t-1}+\sum_{i=0}^{P}\lambda_{2i}\,\Delta LNDDEBT_{t-1}+\sum_{i=0}^{P}\lambda_{3i}\,\Delta LNRGDP_{t-1}$$
$$+\sum_{i=0}^{P}\lambda_{4i}\,\Delta LNINTR_{t-1}+\varphi ECM_{1t-1}+\mathcal{E}_{3t} \quad - \quad - \quad - \quad (6)$$

Where: $\lambda_{1i}-\lambda_{4i}$ are the short-run parameters, and φ is the speed of adjustment parameter, which is expected to be negative, less than zero and significant. The ECM is estimated as the lagged error correction term adopted from the cointegration model of equation (3). The appropriate diagnostic tests can be performed on the long-run and short-run models.

3.4. Estimation technique

The estimation technique for this study adopts a five-step procedure. The first step is the unit root test, which involves the determination of the order of integration using the ADF - Fisher Chi-square statistic. The second step is the cointegration test using the ARDL cointegration technique. The third step is the estimation of the basic ARDL model. The fourth step is the determination of the impact relationship between the dependent and the independent variables estimated for both the short-run and long run over the sample period 1980 – 2019. The final step involves the model diagnostics tests to check for serial correlation, heteroscedasticity, normality, omitted variables and stability.

3.5. Sources of data

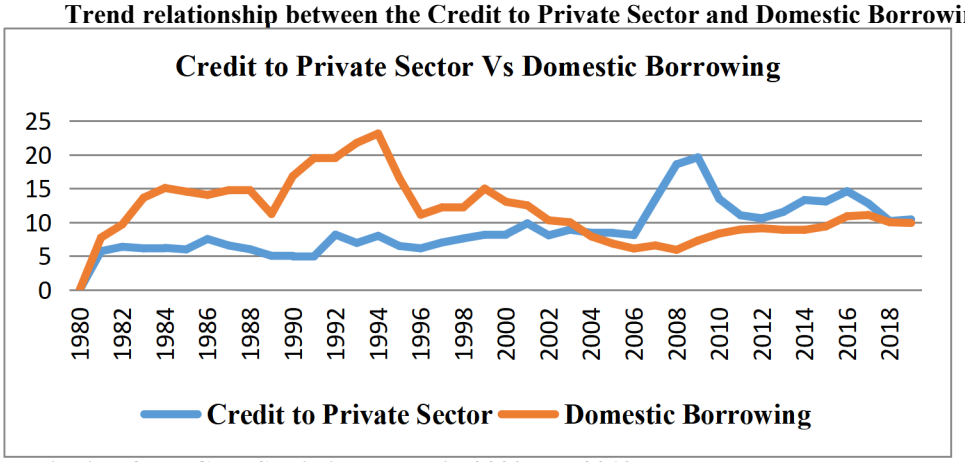
All the data for this study is extracted from the Central Bank of Nigeria (CBN) website.

Table 1 Description and Measurement of Variables

Variable	Description and Measurement	Source
DDEBT	Domestic Deficit Financing is measured by total domestic borrowing by the federal government of Nigeria divided by GDP	CBN Statistics
PCRED	Domestic credit to private sector refers to funds provided to the private sector by financial institutions, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable (Estimated as share of GDP).	CBN
RGDP	GDP refers to the sum of the gross value added by all the producers resident in the country plus the product taxes and minus subsidies. The values are taken at 2010 constant basic prices (annual)	CBN
INTR	Lending rate is the bank rate that usually meets the short- and medium-term financing needs of government and the private sector (Lending rate/Monetary Policy Rate).	CBN
INFL	Inflation rate is estimated on consumer price index and reflects the annual percentage change in the cost to the average consumer of purchasing a basket of goods and services and taken yearly. The Laspeyres formula is used.	CBN

4.0 Empirical results and analysis

Figure 1.0 Trend relationship between the Credit to Private Sector and Domestic Borrowing



Author's Compilation from CBN Statistical Bulletin 2009 and 2019

Figure 1 reveals a general increase in both the credit to the private sector and government borrowing for the period. Further observation reveals that while the credit to the private sector shows a general increase between 1990 to 2008, domestic government borrowing experienced a general decline between 1994 and 2008. An important observation is that while domestic borrowing dominated the credit to the private sector from the beginning and most of the data, the dominance was lost in 2003. The credit to the private sector dominated the data till the end of 2003. Specific points in the data show how the variables moved in the opposite direction, starting with the period between 1982 and 1986. Also, between 1986 and 2006, the variables moved in opposite directions. The opposite trend between the variables manifested again between 2006 and 2011. In conclusion, the variables exhibit a negative relationship between them.

4.2 Descriptive Statistics

This part of the study examines the statistical properties of all the variables used in the study. The variable features presented in Table 4.1 include the median, mean, standard deviation, kurtosis, Jarque–Bera and probability. The means of credit to the private sector, domestic government borrowing, real GDP, inflation, and interest rate are 2.15, 2.42, 10.29, 2.68 and 2.83, respectively. Also, the maximum values exhibited by the variables are 2.98, 3.14, 11.18, 4.29, and 3.46 for credit to the private sector, domestic government borrowing, real GDP, inflation, and interest rate, respectively. Similarly, the respective minimum values associated with the variables credit to the private sector, domestic government borrowing, real GDP, inflation, and interest rate are 1.60, 1.78, 9.53, 1.68, and 2.19. Furthermore, the period of analysis for all the variables covers from 1980 to 2019, making 39 observations. The variables with the highest standard deviation values (variability) for the period are inflation and the real GDP with 0.69 and 0.57, respectively. The peak of the distribution is measured by kurtosis and shows that only interest rate with a value of 3.26 is above 3.0.

Further analysis shows that the other variables in the data have kurtosis values less than 3; hence, the distribution may be classified as platykurtic (short-tailed and fat). The probability estimates of the distribution

are compared to the test of normality (Jarque-Bera) to decide the asymptotic test. The table shows that the estimated probability values are generally low for all the variables, and the means values are nearly equal to the values of the medians; hence, the conclusion is reached that the residuals for the distribution are normally distributed.

Table 2 Descriptive Statistics

	LNPCRED	LNDDEBT	LNRGDP	LNINFL	LNINTR
Mean	2.149	2.419	10.292	2.679	2.834
Median	2.098	2.404	10.073	2.530	2.865
Maximum	2.976	3.141	11.176	4.288	3.455
Minimum	1.599	1.779	9.531	1.684	2.188
Std. Dev.	0.354	0.346	0.572	0.693	0.292
Skewness	0.492	0.142	0.298	0.869	-0.673
Kurtosis	2.519	2.379	1.575	2.868	3.262
Jarque-Bera	1.949	0.758	3.876	4.941	3.059
Probability	0.377	0.485	0.144	0.085	0.217
Observations	39	39	39	39	39

Source: Author's Computation

4.3 Correlation Matrix of Regressors

The correlation estimate of all the variables in the study is shown in Table 3. The result indicates that the variables are not highly correlated except for the credit to the private sector and real GDP which is casually correlated. Hence, the truncated level of correlation among the variables indicates that the variables used in the study do not suffer from multicollinearity.

Table 3 Correlation Estimates

	LNPCRED	LNDDEBT	LNRGDP	LNINFL	LNINTR
LNPCRED	1	-0.5834	0.4349	-0.2955	0.1024
LNDDEBT		1	-0.4995	0.4307	0.2293
LNRGDP			1	-0.2972	0.2050
LNINFL				1	0.3045
LNINTR					1

Source: Author's Computation

4.4 Time Series Properties

The Augmented Dickey-Fuller (ADF) approach is adopted to conduct the unit root test for the study. All the study variables are subjected to the unit root test, and the results are presented in Table 4. The values of the t-statistics became greater than the test critical values at 1%, 5% and 10% at first difference I(1) except for inflation. The probability values at the first difference confirm the stationarity of all the variables at the level of integration. In the joint stationarity test results, the Fisher Chi-square value is 76.26 with an associated probability of zero, and the Choi Z-statistic value is -6.84 with a probability of zero also. Therefore, the unit root test shows that all the variables are integrated in mixed order, with inflation at level [1(0)] and all other variables at the first difference [I(1)]. Hence, the t-statistic for all the variables are greater than the test critical values at all the levels of significance.

Table 4 Stationarity Test

Null Hypothesis: Unit root (individual unit root process) Series: LNPCRED, LNDDEBT, LNRGDP, LNINFL, LNINTR					
Method			Statistic	Prob.**	
ADF - Fisher Chi-square			76.2578	0	
ADF - Choi Z-stat			-6.8427	0	
Series	t-stat	Prob.	Order of Integration	Max Lag	Obs
D(LNPCRED)	-5.6873	0.0000	I(1)	3	36
D(LNDDEBT)	-4.990	0.0002	I(1)	3	36
D(LNRGDP)	-3.4341	0.0160	I(1)	3	36
D(LNINFL)	-3.9788	0.0039	I(0)	3	37
D(LNINTR)	-5.9593	0.0000	I(1)	3	36
Test critical values:	1% level		-3.621023		
	5% level		-2.943427		
	10% level		-2.610263		

Source: Author's Computation

4.5 Lag Selection Criterion

Table 5 shows the lag selection results of the study. Most of the criteria (LR, FPE, AIC, and HQ) choose lag 3 for the estimation process. Hence, lag 3 is used for the Bound Testing exercise and Error Correction Model.

Table 5 Lag Selection Criteria

VAR Lag Order Selection Criteria						
Endogenous variables: LNPCRED LNDDEBT LNGDP LNINFL LNINTR						
Sample: 1980 2019						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-98.977	NA	0.0002	5.7765	5.9964	5.8533
1	99.0700	330.0784	0.0000	-3.8372	-2.5176*	-3.3766
2	137.8426	53.8509	0.0000	-4.6024	-2.1831	-3.7580
3	178.5122	45.1885*	4.03e-09*	-5.4729*	-1.9540	-4.2447*

Source: Author's Computation

4.6 ARDL Cointegration Test

The regular Johansen cointegration test is not plausible to be used for this study on the basis of the varying levels of stationarity [i.e. at orders I(0) and I(1)] at the unit root test. The methodology adopted in this study is the ARDL bound testing approach, as it would constitute the consistent method to estimate the models for the purpose of long-run equilibrium relationship. In line with Pesaran and Shin (1995), the ARDL approach deploys the use of reduced-form equations and hence, it is parsimonious, unlike the conventional method that utilizes multiple equations system.

The ARDL bound test procedure requires that the Wald Test calculated F-statistic value is compared with the critical values of Pesaran and Shin (1995) at the lower bound [I(0)], and upper bound [I(1)] at the 1%, 5% and 10% levels of significance. The result of the ARDL bound test for cointegration analysis is shown in Table 6. From the table, the F-statistic value is 5.0181 and it is greater than all the corresponding upper bounds critical values at the levels of significance.

Table 6 ARDL Bound Test Results

F-Bounds Test	Null Hypothesis: No levels relationship			
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	5.0181	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.50%	3.25	4.49
		1%	3.74	5.06

Source: Author's Computation

The result of the bound test for cointegration test implies that at all the levels of significance, the null hypothesis of no cointegration cannot be accepted. Therefore, a long-run equilibrium relationship runs from credit to the private sector to domestic borrowing, real GDP, interest rate and inflation. However, the exact nature of the long-run association can be established by estimating the ARDL vector error correction model. Specifically, the error correction model will determine the speed of convergence of the system back to equilibrium.

4.7 The ARDL Cointegration Regression Result

Table 7 shows the ARDL short-run and long-run model results. The upper part of the table shows the ARDL short-run model results and error correction term. The error correction term is negative (-0.4076). The value is less than zero and statistically significant with t-statistic (-5.4454) and probability value (0.0001). Therefore, when credit to the private sector is in disequilibrium, the system converges back to equilibrium at a speed of 40.8% per annum. The short-run estimates show that the one-year lag of domestic borrowing, interest rate and real GDP negatively affects credit to the private sector. On the other hand, the impact of inflation on credit to the private sector is minimally positive, and is not significant.

Table 7 ARDL Cointegration Test

ARDL Estimates of Credit to Private Sector and Domestic Borrowing				
Dependent Variable: D(LNPCRED)				
Included observations: 38				
Short run Estimates				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.9827	0.3573	5.5499	0.0000
Δ (LNDDEBT)	0.2068	0.1717	1.2042	0.2413
Δ (LNDDEBT(-1))	-0.3389	0.1640	-2.0670	0.4914
Δ (LNDDEBT(-2))	0.3486	0.1537	2.2680	0.0335
Δ (LNINTR)	-0.3399	0.1725	-1.9710	0.0614
Δ (LNINTR(-1))	0.3250	0.1627	1.9974	0.0501
Δ (LNINFL)	0.0705	0.0413	1.7061	0.1021
Δ (LNRGDP)	-0.4278	0.7847	-0.5451	0.5911
Δ (LNRGDP(-1))	-1.5302	0.7338	-2.0853	0.0489
ECT(-1)*	0.4076	0.0749	5.4454	0.0001
Long run Estimates				
C	1.9827	1.1411	1.7376	0.0963
LNPCRED(-1)*	-0.4076	0.1374	-2.9667	0.0071
LNDDEBT(-1)	-0.3899	0.1801	-2.1649	0.0415
LNINTR(-1)	-0.2583	0.0916	-2.8202	0.0084
LNINFL(-1)	-0.1273	0.0580	-2.1941	0.0391
LNRGDP(-1)	0.0478	0.1114	0.4293	0.6719
R-squared	0.7650	Durbin-Watson stat		1.7645
Adjusted R-squared	0.6491	Heteroskedasticity		1.4166 [0.2281]
F-statistic	5.7353	Normality		1.6760 [0.4326]
Serial Corr. LM	1.5615 [0.2315]	Functional Form		2.7832 [0.0858]

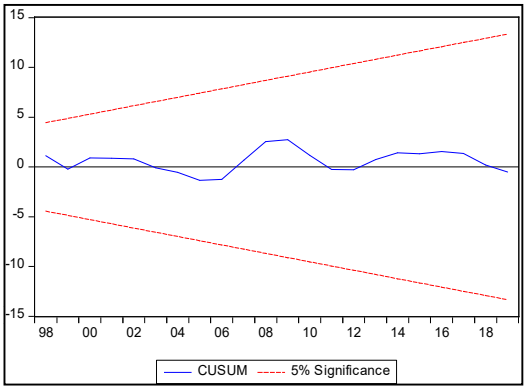
Source: Author's Computation

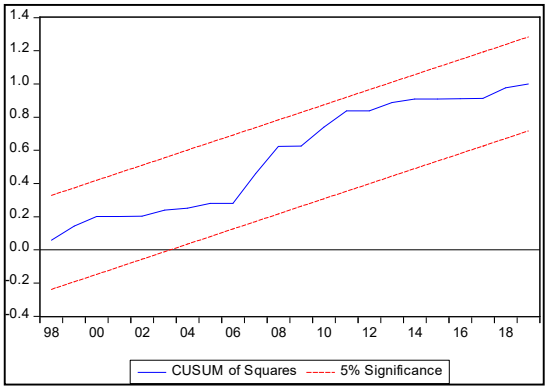
D(LNPCRED) = 1.9827 – 0.4076*LNPCRED(-1) – 0.3899*LNDDEBT(-1) – 0.2583*LNINTR(-1) – 0.1273*LNINFL(-1) + 0.0478*RGDP(-1) - - - - (7)

The ARDL long-run form of the model shows that domestic borrowing interest rate and inflation are significant and negative in affecting credit to the private sector. Therefore, a 10% change in domestic government borrowing induces a 39% change in credit to the private sector in the reverse direction. A more cursory analysis of the result reveals that domestic government borrowing exerts the most dominant effect on credit to the private sector. Furthermore, the effect of real GDP on credit to the private sector in the long run is positive and minimal but not significant. With the strong negative effect of domestic borrowing both in the short-run and long-run on credit to the private sector, it means that the lazy bank hypothesis strongly applies in Nigeria. In addition, the effect of a negative interest rate on the credit to the private sector implies the crowding out of the private sector through the financial market channel.

The adjusted R-Squared for the model shows that 65% of the variation in credit to the private sector is explained by the variation in the explanatory variables in the model. The value of the Durbin-Watson test (1.76) indicates the absence of serial correlation, and this position is reinforced by the Breusch-Godfrey Serial Correlation LM test (1.5615) with a probability value of (0.2315), showing that we cannot reject the null hypothesis on no serial correlation. The Breusch-Pagan-Godfrey test for heteroscedasticity shows that the value of F-statistic is 1.4166 and probability (0.2281); hence the null hypothesis that the model is homoscedastic (free from heteroskedasticity) cannot be rejected. The Normality test for the model shows the value of Jarque-Bera as 1.676 with a probability of 0.4326; hence, we accept the null hypothesis that the residual series for the model is normally distributed. The functional form test using the Ramsey RESET test with the value of 2.7832 and probability of 0.0858 is satisfactory, indicating that the ARDL model is not mis-specified. Finally, the recursive

estimates from the stability test on the model (Figure 2) show that the model is stable at a 5 % level of significance from both the CUSUM and CUSUM Squared tests.





5.0 Conclusions and Recommendations

The study investigates the effect of domestic borrowing on credit to the private sector in Nigeria from 1980 to 2019 to ascertain the application of the lazy bank hypothesis in the country. Following the mixed result in the stationarity estimates of the variables, the study applies the ARDL approach for analysis.

The study established a long-run equilibrium relationship between the variables flowing from credit to the private sector to the explanatory variables in the study. As a follow-up, the study confirmed that domestic government borrowing negatively and significantly impacted credit to the private sector both in the short-run and in the long run. The results further reveal that domestic borrowing exerts the most dominant effect on credit to the private sector. The negative relationship between credit to the private sector and domestic borrowing implies the application of the crowding-out hypothesis and lazy bank hypothesis. The negative relationship between domestic borrowing and credit to the private sector is supported by some studies (Altayligil & Akkay, 2013; Shetta & Kamaly, 2014; Mum & Ismail, 2015; Saibu & Alenoghena, 2017, Abiodun, 2020). Further analysis of the results reveals that while interest rate and inflation negatively affect credit to the private sector, real GDP level positively impacts the credit to the private sector. Therefore, the negative impact of interest rate (in addition to the negative effect of domestic borrowing) on credit to the private sector implies the application of the crowding-out hypothesis.

In line with the findings in this study, the following recommendations are made. First, the Nigerian government should reduce government borrowing from the banking sector to ensure more credit is available to the economy's private sector. Second, the adverse effects of interest rate and inflation on the economy suggest improvement in coordinating the country's fiscal and monetary policy. Finally, the Ministry of Finance and Central Bank should formulate policies to regulate banking activity to ensure improved administration of credit to the economy's private sector.

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