Article

Domestic Credit and Inflation Rate Shock: A New Empiric Evidence from Nigeria

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Article Info

ABSTRACT

The study evaluates the relationship between domestic credit and Nigeria's inflation rate analysing data spanning from 1986 through 2020. The research is ex-post in nature, hence the study employed statistical analysis models to build a predictive assessment for inflation, leveraging on the Autoregressive distributed lag model (ARDL) and the Granger Causality test to ascertain the magnitude of the association and the direction of causation, separately. The study confirms the complexities of Nigeria's relationship between domestic credit and inflation, with economic growth maintaining a positive and insignificant relationship with inflation (INF), while credit to the private sector (CPS) and interest rates have a negative and insignificant relationship with inflation in the long run. Furthermore, in the short run the coefficient of error correction model showed a negative sign, suggesting a short run effect between inflation rate and domestic credit. The findings reaffirm the one-way relationship between inflation and private sector domestic credit. It is advised that funding tools be used efficiently and effectively to fulfil desired investment, competitiveness, and economic growth drives.

Keywords: Inflation, Domestic Credit, ARDL

JEL Classification: E31, G21

INTRODUCTION

Recent financial crises and persistent volatility in global oil prices have sparked interest in the domestic credit flow and inflation trajectory. Inflation has become a significant concern for monetary authorities in developing countries, particularly Nigeria, in the aftermath of the Covid-19. Nigeria has had a sustained increase in inflation rates in recent years, hitting its highest level in four

years, owing to skyrocketing food prices and low purchasing power. According to the National Bureau of Statistics' (NBS) first quarter Consumer Price Index data, inflation increased to 18.17 percent in the first quarter of 2021, up from 17.33 percent in February, a 0.82 percent point increase. Additionally, the data indicates that inflation has slowed in the last three quarters as economic activity restarted following various lengths of time of constraint and shutdowns imposed by the Government to curtail the spread of Covid-19 pandemic. Hence, despite a recent decline in inflationary pressures, the country has maintained to experience increased in food inflation. The assessment, however, linked the increase in food index to an increases in the cost of bread and cereals, as well as protein foods such as fish, meat, and eggs. Additionally, the increase in beverage costs led to the increase in the food price index. The ensuing debates indicate that the Nigerians' purchasing power continues to be undermined by accelerating inflationary pressure. Theoretically, in an inflationary situation, families and businesses find it extremely difficult to make sound investment decisions due to the presence of inflation, which shortens the planning time and erodes confidence.

Literature provides that financial institution through commercial and microfinance banks enhance economic activities, stimulate funds, and redirect savings into profitable investments. Commercial and Microfinance banks play a critical role in generating employment and productivity by channelling funds and credit to the private sector. Nonetheless, financial institutions capabilities may be harmed in unpredictable business circumstances like inflation, prompting them to exercise extreme caution in credit assessment. Over time, rising inflation instability raises unpredictability, which acts as a barrier to venture seeking and investments, complicating predictions, central planning, and allocation of resources, all of which

have a significant adverse effect on economic activity. For developing countries with largely bank-based financial systems, financial activities result in the cost-effective and well-structured routing of funds from surplus to deficit units for productive uses. Ironically, as a business expands, it requires additional cash to finance tasks effectively. However, most of the businesses struggle to secure short term or long-term funding. Not only do corporate clients struggle to raise resources in a number of forms, but also making the choice between debt and equity capital offers significant difficulties. Nevertheless, provision of credit to private sector and major sectors of the economy hold great potential for promoting economic growth. The crucial role of credit in propelling growth of the economy outcomes as well as reducing the inflationary pressures, particularly in emerging and developing countries have been outline in the literature across two viewpoints. The first standpoint of literature argued for an inverse impact of bank credit on inflation (Almalki & Batayneh, 2015; Caglayan & Xu, 2016; Zermeno, Martinez & Preciado, 2014; amongst others). For instance, Likewise, Almalki and Batayneh (2015) examined the nexus between inflation rate and financial sector growth and that inflation exerts a negative and statistically significant impact on financial development. The second viewpoint argues for positive and significant influence of banks credit (Tang, 2001; Eslamloueyan & Darvishi, 2007; amongst others). Thus, the research on the influence of inflation shocks on domestic credit, with a special emphasis on private sector credit growth in developing countries is scant.

An examination of recent events in Nigeria demonstrates that several residents are vulnerable to inflation due to inadequate spending power as well as limited access to funds from financial institutions, making them unable to leverage on loans to balance the expenditures. The earnings

of these individuals are predominantly from the informal sector, which are not covered by public or private institutional structures that can safeguard them from price fluctuations. Thus, to save and sustain citizen current consumption patterns or to purchase financial instruments to protect the value of their assets, monetary authorities have employed inflation targeting. Today's fundamental considerations are whether domestic lending to the private sector reflects a direct or indirect impact on domestic prices. However, this study examines the relationship domestic credit and inflation in Nigeria. This study adds to the current body of knowledge in various ways. The purpose of this study is to close a gap in the literature regarding the effects of inflation rate shock on domestic credit growth. To begin, no study has examined the effect of inflation rate shock on domestic credit growth, particularly in emerging countries such as Nigeria that are prone to high inflation and inflation shock. Second, this article builds on prior research on the determinants of domestic credit by adding alternative characteristics relevant to Nigeria. The study confirms the complexity of the relationship between domestic credit and inflation in Nigeria, with economic growth having a direct and insignificant relationship with inflation (INF), while credit to the private sector (CPS) and interest rates have an adverse and insignificant nexus with inflation. The findings reinforce the one-way relationship between inflation and domestic private sector credit. The rest of the study is structured as ensues: Section 2 entails literature review. Section three focuses on methodological structure. Results are discussed in Section 4. Section five concludes the study.

LITERATURE REVIEW

Domestic credit is a critical factor in the growth of lucrative industries, and its volume effectively fuels the economic expansion process (Maitah, 2012). The relationship between domestic credit, inflation and the growth of a nation's economy has been an essential part of several macroeconomic studies and it also acts as the measure whereby monetary policies are modelled. Besides, the significance of credit in propelling growth of the economy outcomes as well as reducing the inflationary pressures, particularly in emerging and developing countries have been outline in the literature across two viewpoints. The first standpoint of literature argued for an inverse impact of bank credit on inflation (Almalki & Batayneh, 2015; Caglayan & Xu, 2016; Zermeno, Martinez & Preciado, 2014; amongst others). As an example, Almalki and Batayneh (2015) asserted that inflation and financial development are negatively related both in the long-run and the short-run. As a result of greater inflation, Zermeno, Martinez and Preciado (2014) demonstrate that the availability of bank credit to the private sector decreases and the liquidity levels in the economy are lowered.

In contrast, the second viewpoint argues that domestic deposits, GDP, and inflation positively affect banks credit in the long run (Tang, 2001; Eslamloueyan & Darvishi, 2007; among others). In addition to domestic deposits, GDP, and inflation, domestic credit positively impacts the economy over time. According to the estimates, domestic deposits do not affect the credit behaviour of banks in the short run, meaning banks do not directly lend to the private sector. However, both the short- and long-term effects of money supply on lending are negative. Using Pesaran, Shin, and Smith's (2001) bounds testing method, Eslamloueyan and Darvishi (2007) examined the effects of bank credit in Iran, a country without interest-bearing banks. The findings found that while bank credit has no short-term impact on price levels in Iran, there is a long-term association involving inflation with bank lending.

Thus, despite the research on the influence of inflation variations on domestic credit, with a special emphasis on private sector credit growth in developing countries particularly Nigeria is scant. Few of the related empirical investigations that

examines the relationship between domestic credit and inflation include the work of Amassona, Nwosu and Olaiya (2011), Aliero, Abdullahi, and Adamu (2013) and Akinlo and Oni (2015). Amassona, Nwosu and Olaiya (2011) investigated the effects of macroeconomic factors on domestic credit in Nigeria spanning from 1986 through 2009. The findings revealed that monetary policy has witnessed the implementation of various policy initiatives and that exchange rate has a significant influence on price instability. Additionally, Akinlo and Oni (2015) used the error correction technique to examine the major determinants impacting domestic lending to the private sector in Nigeria between 1980 and 2010. They discovered that the liquidity ratio, cyclical risk premium, and wide money all contribute to the expansion of credit to the private sector. Adegboyega, Maku, and Olayiwola (2019) argued for a long term association between stock returns and inflation, as well as a unidirectional causal link between stock market returns with rate of inflation in Nigeria spanning 1985 to 2018.

A view based on scientific evidence concentrating on the variables impacting domestic credit (Aisen & Franken, 2010; Gozgor, 2014; Guo & Stepanyan, 2011; Kamil & Rai, 2010; among others). These studies opined that the boom preceding the economic downturn and the significant drop in output among primary trading collaborators were the main contributory enablers of credit expansion, with countercyclical monetary policy and domestic liquidity also playing a part in emerging market economies (EMEs). Additionally, Guo and Stepanyan suggested that domestic and foreign credit were significant predictors of domestic credit in EMEs. Imran and Nishat (2013) examined the long-run effects of bank credit to the private sector on foreign liabilities, domestic deposits, economic growth, and exchange rates. Furthermore, the authors concluded that banks'

interest rates on deposits provided to their consumers influenced domestic credit. According to Sanfilippo-Azofra, Torre-Olmo, Cantero-Saiz, and López-Gutiérrez (2018), monetary policy has a minor effect on the supply of bank loans in less developed financial systems. Mushtaq and Siddiqui (2017) suggested that while interest rates have little effect on bank deposits in Islamic countries, they have a considerable beneficial effect on bank deposits in non-Islamic economies. Meslier, Risfandy, and Tarazi (2017) examined the pricing strategies of Islamic and conventional banks in a sample of 20 countries with dual banking systems and discovered significant disparities in their pricing strategies. While conventional banks enjoy a greater market share and hence can offer lower deposit rates, Islamic organizations are unable to do so. Nonetheless, the findings regarding the causes for domestic credit reached inconsistent conclusions in a number of instances, highlighting the critical need for additional research in this sector. Additionally, different methodologies have produced conflicting findings on the relationship between inflation and financial advancement (Adegboyega & Odusanya, 2014). On the other hand, the overwhelming majority of research demonstrates a strong correlation between inflation and domestic credit. Given these realities, Nigeria's economic problem must be handled. Is a connection between domestic credit and price shocks evident in Nigeria? What is the relationship between domestic credit and inflation? To what degree do macroeconomic inflationary variations in Nigeria reflect domestic credit movement?

METHODOLOGY

This paper employed the Autoregressive distributed lag (ARDL) bound testing technique which was suggested by Pesaran et al. (2001) to analyse the relationship between inflation rate

shock and domestic credit in Nigeria. The baseline regression model is as follows:

$$INF_t = \omega_0 + \omega_1 GDP_t + \omega_2 CPS_t + \omega_3 CGS_t + \omega_4 INT_t + \mu_t \dots \quad \dots \dots \quad (1)$$

where, $\omega_0, \omega_2, \omega_3, \omega_4$ are the coefficients of the variables, μ denotes white noise error term or stochastic term. INF denotes inflation rate, GDP denotes gross domestic product, CPS denotes credit to private sector, CGS denotes credit to government sector, and INT denotes and interest rate. The expected sign of the parameters β's are all expected to be positive (i.e., > 0). All dataset were transformed to natural logarithms to avoid the problem of heteroscedasticity, issue of data comparability as well as measurement issue. Consequently, we transformed equation (1) into log form as:

$$lnINF_t = \omega_0 + \omega_1 lnGDP_t + \omega_2 lnCPS_t + \omega_3 lnCGS_t + \omega_0 lnINT_t + \mu_t \dots \quad \dots \dots \quad (2)$$

However, for a variety of reasons, the ARDL methodology is selected over the others (Kyophilavong et. al., 2013; Adegboyega, Akinbobola and Ajayi, 2020). First, the method is applied regardless of order of integration of I (0), I(1), or a combination of I(0) and I(1). Second, a simple linear transformation can be used to construct the unrestricted error correction model (UECM) from the ARDL bounds testing. Furthermore, the ARDL technique produces consistent findings even with a limited sample scope. Consequently, this study employed annual

data obtained from the Central Bank of Nigeria covering the period from 1986 to 2020. This period was chosen based on the data availability. The economic variables used in this paper are inflation rate (INF), gross domestic product (GDP), credit to private sector (CPS), credit to government sector (CGS) and interest rate (INT). However, the choices of variables are consistent with previous empirical literature (Backé & Zumer 2005; Egert, Backé, & Zumer, 2007; Kiss, Márton & Vonnák, 2015; Ikpesu, 2021).

RESULT AND DISCUSSION

Summary of Descriptive Statistics

The descriptive statistics for the variables used in the analysis are shown in Table 1. The inflation rate (INF), gross domestic product (GDP), credit to the private sector (CPS), credit to the government sector (CGS), and interest rate (INT) mean values were 2.316, 25.774, 2.217, 14.927, and 1.875, respectively, compared to the median values of 2.302, 25.376, 2.187, 15.562, and 1.801. However, all of the relevant variables are positively skewed. Additionally, the Kurtosis results for INF, GDP, CPS, and CGS were platykurtic due to the low p-values, whereas only INT was leptokurtic due to the high p-value. Additionally, the Jarque-Bera statistics indicate that the series are normally distributed, as none of the series' p-values are statistically significant at the 5% level. As a result, the alternative hypothesis that each variable is normally distributed must be accepted.

Table 1

Descriptive Analysis

	INF	GDP	CPS	CGS	INT
Mean	2.3163	25.7740	2.2179	14.9271	1.8758
Median	2.3025	25.3763	2.1871	15.5627	1.8010
Maximum	2.8045	27.0271	2.6815	18.6077	2.8602
Minimum	1.7439	24.6175	1.6009	9.8807	-0.0091
Std. Dev.	0.3130	1.02366	0.3366	3.0401	0.7176
Skewness	-0.1889	0.04917	-0.3615	-0.4434	-1.0545
Kurtosis	2.0018	1.1354	2.1039	1.9036	4.2206

Jarque-Bera	0.7119	2.1789	0.8285	1.2429	3.7116
Probability	0.7004	0.3363	0.6608	0.5371	0.1563

Source: Author's Estimation (2022)

Table 2 presents the correlation coefficients of inflation rates (INF), gross domestic product (GDP), credit to private sector (CPS), credit to government sector (CGS) and interest rate (INR). The results show that only gross domestic product and credit to private sector was perfectly correlated while none among others of the correlation coefficient in the table was perfectly correlated.

Table 2

Correlation Matrix

	INF	GDP	CPS	CGS	INT
INF	1.0000				
GDP	0.3516	1.0000			
CPS	0.2409	0.9045	1.0000		
CGS	0.5502	0.8771	0.8745	1.0000	
INT	-0.3441	0.1362	0.1937	0.1328	1.0000

Source: Author's Estimation (2022)

Results of cointegration test

Table 3 summarizes the findings of the ARDL bounds test. We observe from this table that there is no compelling long-run link between the variables. Additionally, the finding demonstrated that we cannot reject the null hypothesis of no integration, as inflation is the dependent variable, implying that there is no cointegration between the variables. Table 3 illustrates the effect of cointegration on boundary conditions. Due to the 2.56 and 3.59 lower and higher bond test statistics at 5% significance, the measured F-statistics of 10.016 are greater than the lower and upper band tests, indicating that the variables in the model do have a long-lasting association. Hence both long run and short run relationship exists between inflation and domestic credit in Nigeria which is in contrast to the study conducted by Eslamloueyan and Darvishi (2007).

Table 3

Results of ARDL Bound Cointegration Test

Test Statistics	Value	Lower Bound @ 5%	Upper Bound @5%
F-Statistic	10.016	2.56	3.59

Source: Author's Estimation (2022)

After finding the existence of cointegration between the variables, we further estimate the long run and short run effects of domestic credit on inflation using ARDL tchniques. Table 4 displayed the results of the relationship between domestic credit and inflation in Nigeria in the long run. The results show that the coefficient of the GDP (gross domestic product) is 0.0007, which means that gross domestic product has positive relationship with INF although not statistically significant at 5 percent level. This indicates that a unit increase in GDP will lead to 0.0007% increase in INF in Nigeria. The coefficient of the CPS (credit to private sector) is -0.8421, which means that credit to private sector has an inverse relationship with inflation. This indicates that a unit increase in CPS will lead to -0.8421% decrease in INF. Showing a significant effect between credit to private sector (CPS) and INF at 10 percent significant level. The results suggest that price instability exacerbate

uncertainty of expected returns on financial loan and consequently erode the lending confidence of commercial banks which in turn reduces the amount of loan obtainable to businesses and individuals which corroborate the finding by Caglayan and Xu (2016). In addition, the coefficient of credit to government sector (CGS) is estimated as 0.1428, which means that credit to government sector has a positive relationship with INF. This indicates that a unit increase in credit to government sector will lead to increase in INF indicating a statistically significant effect between credit to government sector and inflation. The

coefficient of the interest rate (INT) is -0.1540, which means that interest rate has an inverse relationship with INF. This indicates that a unit increase in interest rate will lead to -0.1540% decrease in INF, indicating that the relationship is statistically significant at 10 percent. Also, from Table 4, the F-statistics (5.0200) has probability less than 5%, which indicate that macro-economic variables included in the model has combined significant effect on inflation in Nigeria. The coefficient of Adjusted R-squared shows that about 53% of the changes in inflation can be explained by the independent variables.

Table 4

Long run results of the Relationship between Domestic Credit and Inflation

Variable	Coefficient	t-statistic	Prob.
C	2.3216	0.7967	0.4441
GDP	0.0007	0.0055	0.9957
CPS	-0.8428	-1.9181	0.0841*
CGS	0.1428	3.3530	0.0073**
INT	-0.1540	-1.8907	0.0880*
R-squared		0.6675	
Adjusted R squared		0.5345	
F-statistic		5.0200 (0.0176)	

Source: Author's Estimation (2022)

** and * stand for 5% and 10% significant level

Table 5 reports the short run effect of the relationship between inflation in Nigeria and domestic credit. From the estimate, it shows that the coefficient of the ECM is negative and found to be statistically significant at 5 percent level as the

value is -0.996. This suggests that the reverser period would be fast in the short run for the equilibrium to be stabilised. The outcome also suggests that there exists at least one direction of causality between the variable of interest.

Table 5

Short-run results of the Relationship between Domestic Credit and Inflation

Variable	Coefficient	t-Statistic	Prob.
D(INT)	-1.194	-9.562**	0.000
D(LGDP)	-28.259	-3.924**	0.000
D(IGDP(-1))	-17.888	-2.129**	0.043
ECM(-1)	-0.996	-8.521**	0.000

Source: Author's Estimation (2022)

** and * stands for 5% and 10% significant level

The diagnostic test, shown in Table 6, demonstrates that the model is free of serial correlation and heteroskedaticity. Ramsey RESET demonstrates that the framework specifies inconsistency. However, the CUSUM recursive test confirms a relatively high degree of stability for the model relationship, indicating that the model is reliable and the long-term coefficients are stable.

Thus, the estimated models passed all diagnostic tests for homoscedasticity. Also, the results in Figure 1 depicted the CUSUM of Square whose lines falls within the critical bounds of 5 percent significance This suggests that the series exhibits structural stability and that if estimated would produce ideal outcomes.

Table 6
Statistical Output for Diagnostic Check

Test Name	F-Statsitic	P-Value
Normality	0.2950	0.8628
Serial Correlation LM	0.6468	0.5313
ARCH test	6.6697	0.0146
Heteroskedasticity	0.1223	0.1197

Source: Author's Estimation (2022)
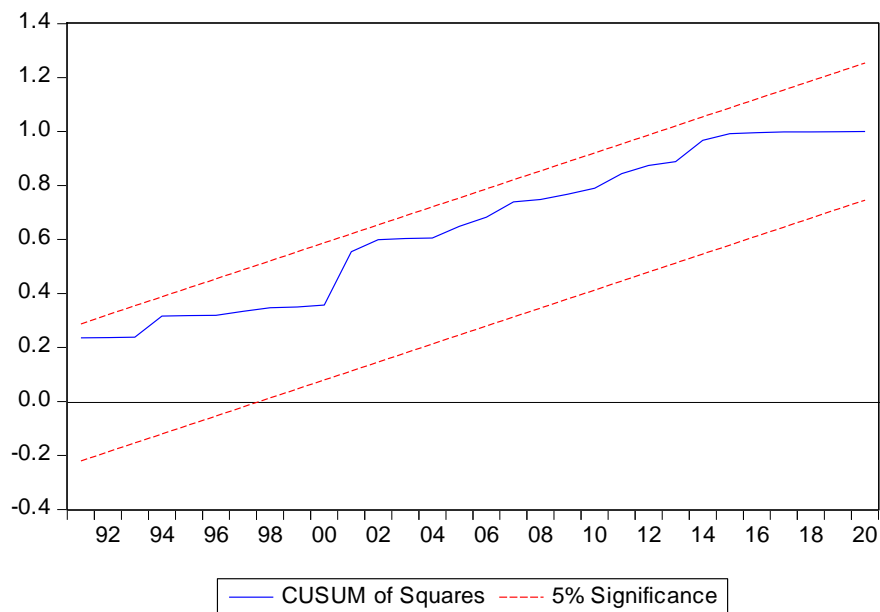
Figure 1
CUSUM Stability Test

The results of the Granger causality tests are presented in Table 7. The Granger causality technique provides useful information on the variables for the prediction of the other variables included in the analysis. Table 6 revealed the outcome of the pair-wise granger causality test, where it was evident that uni-directional causalities exist between Gross domestic product

(GDP) and inflation ($F = 4.18814$; $p < 0.05$). The findings imply that gross domestic product granger caused inflation. Similarly, a uni-directional causality exist between Gross domestic product (GDP) and credit to private sector (CPS) ($F = 5.15053$; $p < 0.05$), indicating that gross domestic product granger caused inflation. Also, uni-directional relationship exist between Inflation (INF) credit to private sector ($F = 4.70239$; $p < 0.05$), indicating that

inflation contribute to credit to private sector while CGS also granger caused inflation (INF) (F = 3.5539; p < 0.05) indicating that credit to government sector (CGS) contribute to inflation in Nigeria. Above all, no evidence of causality exist either between credit to private sector (CPS) and credit to government sector (CGS); nor between credit to government sector (CGS) and gross domestic product (GDP)

Table 7
Estimate of Granger Causality Test

Null Hypothesis:	F-Statistic	Prob.	Remarks
GDP to INF	4.1881	0.0256	Uni-direction
INF to GDP	1.0330	0.3691	
CPS to INF	1.6481	0.2105	
INF to CPS	4.7023	0.0173	Uni-direction
CGS to INF	3.5539	0.0565	Uni-direction
INF to CGS	0.0290	0.9715	
CPS to GDP	2.5010	0.1001	
GDP to CPS	5.1505	0.0125	Uni-direction
CGS to GDP	2.8372	0.0924	
GDP to CGS	0.6884	0.5186	No-Causality
CGS to CPS	1.2784	0.3091	
CPS to CGS	1.4702	0.2633	No-Causality

Source: Author's Estimation (2022)

CONCLUSION

The study investigated the nexus between domestic credit and inflation in Nigeria, using inflation rate, gross domestic credit, credit to private sector, credit to government sector and interest rate over the period 1986 to 2020. Various methodology were employed and results emanating shows that gross domestic product (GDP) is related positively and was statistically significant with inflation measured by consumer price index (CPI) in Nigeria within the period studied. By implication, an increase in the total output of goods and services produced in Nigeria, would not lead to an increase in inflation rates. This result supported the findings of Ihugba, Ebomuche and Ezeonye (2013). Also, the study found that credit to private sector (CPS) has a non – significant and negative effect on inflation. i.e., inversely related. This implied that an increase in credit to private sector would lead to a decrease in inflation rates. This result did not agree with Lorna (2018) who reported private sector growth credit is positively linked to a one period lag in inflation volatility. Furthermore, the result of credit to government sector (CGS) is related positively and statistically significant to inflation. This implied that increase in credit to the government sector would lead to increase in inflation. Also, in the short run the nexus between domestic credit and inflations is found to be statistically significant. Furthermore, the outcome of the granger causality test is insightful, although zero causality were evident among some determinant of inflation under the study examined but eminent was the uni-directional relationship that exist between inflation rate, credit to government sector, gross domestic product and credit to private sector of the economy. It is however, important that the Nigerian government should support economic policies that keeps inflation rate down to improve the level of credit to private sector, since the private sector are conceived as an engine of growth in any economy.

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