



The Effects of Bank Loans on Economic Growth in Nigeria (1981-2021)

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ABSTRACT

Countries desire economic growth due to its effects on the entire economy. Growth leads to reduced unemployment, increased income, and, all things being equal, improved standards of living. However, several countries have experienced weaker-than-expected growth in their economies. In this paper, I explored the relationship between bank credit and economic growth in Nigeria, and how bank credit can cause growth. The data sourced from the Central Bank of Nigeria statistical bulletin were tested for co-integration and unit root tests. The ordinary Least Squares Method was used to analyze the sourced data. My data set was subjected to various statistical (First-Order) tests. Econometric (second-order) tests were also employed. The results showed a positive relationship between credits to both the manufacturing and public sectors of the economy and GDP. However, loans to the commercial and services sectors did not seem to generate the expected growth levels. The results suggest that more credit needs to be approved for the manufacturing sector of the Nigerian economy rather than the services sector.

Keywords: Economic growth, Economic Development, Bank loans, Private sector, Public Sector

JEL Codes : E51, G21, O40, C22

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1. INTRODUCTION

1.1. Background to the study

An economy that experiences high growth rates will (*ceteris paribus*) witness an improvement in the standards of living of its citizens. High infant mortality, very low opportunities, low life expectancy, and unemployment are bound to occur in countries with very low economic growth rates. Economic growth provides the needed capital for investment and economic development. Growth also ensures (to some extent) increased disposable incomes, which foster consumption and investment, and thus, through the accelerator and multiplier principles, lead to further growth. Economic growth guarantees employment, which reduces social disorder as well as the burden on governments.

Although many countries have made serious efforts to ensure growth in their economies, these efforts have not worked for some countries, though, due to several factors, including corruption, the fundamental structure of their economies, and the unavailability of loanable funds needed for investment in both the public and private sectors. Hence, most countries have remained poor, suffering the perils of economic stagnation and low growth rates.

This research paper studies how countries may achieve economic growth (and thus enjoy the benefits that follow increased growth) by investigating the relationship between bank lending and economic development in Nigeria within the period 1981 to 2021.

1.2. Statement of the Problem

Economic literature supports the view that bank credits bring about economic growth. When banks give loans to their customers, the borrowed funds are invested in profitable ventures. Afterwards, the loans are repaid with interest, and the investments contribute to economic growth through the multiplier principle.

However, several bank loans have in the past gone delinquent. This had brought about bank failures as well as bank bailouts using public funds. This paper examines the model of bank lending that would guarantee profitability, investment, and subsequently, economic growth in Nigeria.

1.3. Objectives of the Study

The primary objective of the study is to measure the impact of Deposit Money Bank lending on economic growth in Nigeria. However, the specific goals of the study are stated thus:

- To measure the impact of Deposit Money Bank loans on economic growth in Nigeria.
- To ascertain the causality relationship between Deposit Money Bank loans to the various sectors of the Nigerian economy.

1.4. Research Questions

- What is the impact of Deposit Money Bank loans on economic growth in Nigeria?
- What is the causality relationship between Deposit Money Bank loans to the various sectors of the Nigerian economy?

1.5. Hypotheses of the Study

- H₁: Deposit Money Bank loans have no significant impact on economic growth in Nigeria.
- H₂: There is no causal relationship between Deposit Money Bank loans to the various sectors of the Nigerian economy.

2. LITERATURE REVIEW

This section reviews the relevant literature that relates to the study. The section will be further divided into the following sub-sections: Conceptual Framework, Theoretical Framework, and Empirical Framework.

2.1. Conceptual framework

2.1.1. The concept of bank lending and credit

Bank lending is the practice of granting credit facilities to individuals and corporate institutions by banks. The facilities may be further classified as either term loans or overdrafts. Term loans are scheduled to be paid back within a specified period of time (with payments to the Principal amount and accrued interest). At the same time, overdrafts are offered at a compounding interest rate. Banks and other non-bank financial intermediaries may grant loans. Banks that provide credit facilities in Nigeria include: Commercial Banks, Mortgage Banks, Microfinance Banks, and Merchant Banks. Other Non-bank financial institutions like the ESUSU, Savings and loans firms, and individual money lenders also offer credit facilities in Nigeria.

Lending, in its simplest form, is temporarily giving money to an individual, a group of individuals, or a corporate body with the expectation that it will be repaid within a stipulated period of time. In the banking industry, lending of money/loan attracts a fee called interest. Commercial banks are business organizations established to carry out banking operations and maximize returns to their shareholders.

Banks grant loans and advances to customers so as to make a profit. This profit can only be earned through the interest charged on loans and advances to customers. The interest charged by banks on loans is usually arrived at by taking into account the prevalent market interest rate as well as the monetary policy rate of the Central Bank of Nigeria (CBN).

Banks accept deposits from individuals and corporate bodies (owners of funds) and offer them to the users of funds in the form of loans and overdrafts. This means that funds are transferred to the deficit sector from the surplus sector of the economy (Mishkin 2007).

2.1.2. Factors that determine bank lending

2.2.2.1 Regulation

Central Banks often utilize such requirements as minimum reserve ratios, directives, capital adequacy, and liquidity ratios to regulate bank lending.

2.2.2.2 Financial Market Conditions

The availability of loanable funds, as well as the forces of demand and supply of money, determine the volume of commercial bank loans as well as the market interest rates charged on the loans.

2.1.3. Concept of economic growth

Economic growth may be seen as an increase in a country's Gross Domestic Product (GDP). Robert and Benjamin (2004) view economic growth as an increase in the volume of goods and services produced per head.

2.1.4. Concept of economic development

While economic growth may be seen as mere increases in the level of Gross Domestic Product, Economic development includes the improvement in the standards of living of the citizens of the country. This increase in living standards may be viewed from the levels of poverty, unemployment, health, and education.

2.2. Theoretical framework

2.2.1. Theories of economic growth

Theories are explanations of phenomena. Hence, economic growth may be seen as sections of the various ways through which activities, events, or factors cause economic growth. These theories may be listed as follows:

2.2.1.1. Classical Growth Theory

Adam Smith, David Ricardo, and Thomas Malthus were the chief proponents of this theory. The classical growth theory supports the view that growth is brought about through capital accumulation and technological progress. According to the classical economists, other drivers of development include: free market, division of labour, and specialization.

2.2.1.2. Neo-Classical Growth Theory

Trevor Swan and Robert Solow were the leading proponents of this theory. They were called the neo-classicals because they came after the classical economists. This theory holds that while technological progress causes growth, there might be diminishing returns in capital and labour. Hence, as opposed to the classical view, growth may actually slow down due to the diminishing returns associated with both labour and capital.

2.2.1.3. Endogenous Growth Theory

As opposed to earlier theories, the endogenous growth theory emphasizes the importance of internally generated growth through such factors as technological innovation and human capital development. Paul Romer was a key proponent of this theory.

2.2.1.4. Rostow's Stages of Growth

The Rostow Model outlines several stages (in sequence) through which economies pass as they experience growth. This starts with the traditional economies where agriculture is the key driver of development, and extends to highly developed economies with a very broad range of consumption and production patterns.

2.2.1.5. Dependency Theory

This growth theory argues that the less developed countries actually depend on the economically developed countries to grow. The dependent theory holds that several economic and political factors make it difficult for the less developed countries to experience economic growth without having to depend on the developed countries.

2.2.1.6. Vicious Cycle Theory

The Vicious cycle theory explains why poor nations remain predominantly poor. It further explains that due to the low level of savings (capital formation), productivity, and investment in less developed economies, these economies tend to remain predominantly poor.

2.2.1.7. Balanced Vs Unbalanced Growth

The balanced versus unbalanced growth theory explores the consequences of spreading investments across all the sectors of the economy. When investments are spread across all the sectors, it is called balanced growth. However, when investments are concentrated only on a few sectors, it is called unbalanced growth. The theory argues that the level of growth in every economy depends on whether or not the spread of investments is balanced or unbalanced.

2.2.1.8. Dualism

The Dualism theory suggests that less developed economies usually have two separate structures. There is the industrialized sector and the traditional sector.

2.2.1.9. Lewis-Fei-Ranis-Theory

This theory, first of all, establishes that there exists both an urban and rural sector in developing economies. Then it argues that the transition from a purely agrarian economy to an industrial economy happens when there is migration of labour from rural to urban areas.

2.2.2. Bank lending theories

2.2.2.1. Financial Intermediation Theory

The financial intermediation theory proposes that banks and other financial institutions are financial intermediaries that collect deposits from owners (savers) of funds and lend the funds to users (borrowers).

2.2.2.2. Fractional Reserve Theory

The fractional reserve theory holds that banks lend only a fraction of the deposits that they receive from customers. The remaining part (fraction) of the total deposits is held as

reserves either in the bank's vault (safe) or in the bank's account with the Central bank. An interesting thing about this theory is that banks have the capability of creating money (or increasing the level of money supply) by lending a fraction of their deposits to borrowers who deposit the same amount in another bank. Thus, allowing the second bank to also lend a fraction of the received deposit.

2.2.2.3.Theories of Competition and Bank Lending

Competition among banks has significant effects on how much banks lend and the rate of interest they charge. As with other industries, competition also brings about efficiency in the banking industry as well as lower lending rates, which may help to stimulate the economy.

2.2.2.4.Lending Channel and Standards

These theories explore the link between bank lending and the lending policies and standards that are determined by the central banks. It is interesting to note that the central banks influence the lending capabilities of commercial banks through their monetary policy tools which include: interest rates, cash reserve ratio, and open market operations.

2.3.Empirical review

Several authors have attempted to study the effects of bank loans on economic growth. Among them, Wappiello et al (2010) examined the impact of bank credits on the development of the US economy and found a positive relationship between the two variables. Vazakidis and Adamopoulos (2009), in their study of the Italian market for the period 1965-2007, found a positive relationship between economic growth and bank lending. This was a reverse causality, as vector models were utilized in their study. This means that, while bank lending causes economic development, economic growth also causes banks to lend more money.

Earlier studies have also revealed that other factors, such as volume of bank deposits, the development of the financial system, and the development of the credit market itself, are also important. Shan and Jianhong (2006) studied the effects of the development of the Chinese financial sector on the country's economic growth using VAR models. They found a positive relationship between the two variables. Also, Liang (2001) studied the Chinese banking sector development between 1990 and 2001. The result was a weak but positive relationship between growth and the development of the Chinese banking sector.

Mishra et al (2009) studied the relationship between the credit market development in India for the period 1980 to 2008. The result was a positive relationship between the two variables. Since the R model was utilized in this study, the results indicated a reverse causality between economic growth and the credit market development.

Another interesting study on the relationship between bank credit and economic growth was conducted by Dey and Flaherty (2005). Among other findings, their results suggested a positive relationship between bank credit and economic growth.

3. METHODOLOGY

This sub-section explains the methods employed in this research work and contains such sections as research design, data analysis techniques, model specification, econometric tests, and sources of data for the research.

A time frame of forty (40) years, from 1981 to 2021, was the scope of this study, and data were sourced from the Central Bank of Nigeria (CBN) statistical bulletin of 2022. The dependent variable was Gross Domestic Product (GDP). The independent variables were the volumes of loans granted by Deposit Money Banks to several sectors of the Nigerian economy.

In analyzing the data, the paper employed ordinary least squares (OLS) techniques as a means of estimating the effects of independent variables on the dependent variable. This technique was chosen because it produces the best linear unbiased (BLU) estimators.

3.1. Research Design

The study employed the ex post facto type of research and relied heavily on secondary data. Ex post facto design is considered a quasi-experimental type of study, which means that participants are not randomly assigned, but rather grouped based upon specific characteristics or traits that they share. Ex post facto research focuses on how actions that have already occurred can predict particular causes.

This type of research study tests hypotheses to locate a cause-and-effect relationship between the dependent and independent variables.

3.2. Data Analysis Techniques

The research adopted annual time series data on Gross Domestic Product and deposit money bank loans and made use of Ordinary Least Squares (OLS) techniques in carrying out the analysis. Multiple linear Regression was chosen as the data analysis technique. The choice of linear regression stems from the fact that the ordinary Least squares method is BLUE (Best Linear Unbiased Estimator). This technique was also adopted by many researchers and yielded optimal results. Its data requirements are not excessive when compared to other data analysis techniques. Econometric Views software was used to generate the data analysis results.

3.3. Model Specification

The model for this study is specified thus:

$$GDP = f(DMBL)$$

Where: GDP Gross Domestic Product

DMDMBLe posit Money Bank Loans of several categories, including loans to the production sector (PROD), loans for general commerce (GENCOM), loans to the services sector (SERV), and loans to the public sector (PUB).

F = f=fapping rule which expresses functional relationship.

Expressing the above equation in econometric form yields:

$$GDP = \beta_0 + \beta_1 PROD_L + \beta_2 GENC_L + \beta_3 SERV_L + \beta_4 PUB_L + \mu$$

Where:

β_0 is the constant,

β_1 is the coefficient of the independent variables,

$PROD_L$ is loans to the production sector,

$GENC_L$ is a loan to the general commerce sector,

$SERV_L$ is a loan to the services sector,

PUB_L is loans to the public sector,

μ is the error term.

3.4. A priori Expectation

Based on theoretical explanations, the researcher expected a positive relationship between GDP and Deposit Money Bank loans. Hence, this implies that the sign of the coefficient β_1 is expected to be positive.

3.5. Econometric Test

As explained below, these are diagnostic tests done on the variables in the model. They include pre- and post-estimation tests.

3.5.1. Pre-Estimation Test

Before the estimation of the regression, standard statistical/econometric analysis, such as the unit root test and co-integration test, was performed on the time series data to ensure that spurious or nonsense regression results were not generated, as well as to establish whether or not a long-run relationship existed between the variables in the models. Hence, these tests were carried out to ensure that the variables employed in the model were in order. They are as follows:

3.5.2. Unit Root/Stationarity Test

A unit root test was used to determine whether or not a variable's mean value and variance varied over time. This test is necessary when time series data are used to avoid the problem of spurious regression. The Augmented Dickey Fuller (ADF) test was used for the test, and results were obtained.

Decision Rule: If the ADF test statistic is greater than the Mackinnon critical value at 5%, the variable is said to be stationary. Otherwise, it is non-stationary.

3.5.3. Co-integration Test

The Co-Integration test was used to establish whether or not there is a long-run relationship between the variable to be investigated. The Johansen or Engel-Granger test was used.

Decision rule: If the Johansen test statistic is greater than the critical value at 5%, then the variables are co-integrated.

3.5.4. Error Correction Model (ECM)

If Co-Integration exists among the variables, then the error correction model would be estimated. The Error Correction Model is utilized to estimate the short-term dynamics and the speed at which the short-run disequilibrium corrects to achieve a long-run relationship.

Decision Rule: In conducting the ECM, the expected sign of the result should be negative. A positive ECM implies a model misspecification or an indication of structural changes and will not give the rate of change in the dependent and independent variables.

3.5.5. Post Estimation Test

These tests are carried out to check the reliability and validity of the model estimated. They include stability tests and residual tests.

3.5.6. Autocorrelation Test

To evaluate the reliability of the expected numerical estimates, the Durbin-Watson (DW) statistic at 5% was used to test for the presence of autocorrelation.

Decision rule: If the computed value of DW is greater than the tabulated value (ie, lies outside the acceptance region) t , then there is no autocorrelation. Otherwise, the presence of autocorrelation will be detected, and other remedial methods will be applied to the model.

3.5.7. Normality Test

The study carried out a normality test to verify whether or not the error term (residuals) is normally distributed.

Following OLS assumptions, the error term U is usually distributed with zero mean and constant variance.

$U \sim N(0, \sigma^2)$. The Jarque-Bera (JB) test of normality was used in this research work.

Decision Rule: If JB calculated is greater than JB tabulated, then the residuals are normally distributed.

3.5.8. Heteroscedasticity Test

The heteroscedasticity test reveals whether or not the error terms have a constant variance. Non-constant variance can cause the estimated model to yield a biased result. White's General Heteroscedasticity Test was adopted in this research work.

3.5.9. Granger Causality Test

The results of regression analysis show some sort of relationship between two or more variables. However, this does not necessarily imply causality. In other words, the existence of a relationship among variables does not imply causality or the direction of influence (Gujarati, 2004). The Granger causality test was applied in this research work to ascertain whether or not a causal relationship existed between economic growth and deposit money bank lending.

3.6. Sources of Data

Data for this research work were sourced entirely from the Central Bank of Nigeria Statistical Bulletins of 2014 and 2020. The reason for merging the two Statistical Bulletins is based on the fact that information on Deposit Money Bank lending to the various sectors of the Nigerian Economy for the period 1981 to 2021 could not be contained in a single bulletin as published by the CBN. Hence the 2014 Bulletin contains data on DMB credits for the periods 1981 to 2014, while the 2020 Statistical Bulletin contains data on credit by DMB from 2008 to 2020. It should be noted that, based on the sectoral classifications of the Central Bank of Nigeria in the Statistical Bulletin, this study categorized the sectors as Services, Production, General Commerce, and the Public sector. To further make a clear distinction between the public sector and the private sector, the study categorized the three sectors, viz, Services, Production, and General Commerce, as the private sectors of the Nigerian economy.

4. RESULTS AND DISCUSSION

This section contains the presentation and analysis of the data used for the study, as well as a test of Hypotheses and a discussion of significant findings.

4.1. Presentation and analysis of test results

4.1.1. Unit Root Test Results

This research employed time series variables, which were generated through a stochastic process; we need to determine if this stochastic process is stationary. Subsequently, the Augmented Dickey Fuller test was adopted. Following the ADF test, a variable is stationary if the absolute ADF value is greater than the Mackinnon value.

Table 1. Results of Unit Root Test (Ulasi Joshua Ikechukwu, 2025, 9)

Variables Integration	ADF Statistic	ADF 5%critical	P-Value	Order of
CRED_PROD	-10.80895	-2.963972*	0.0107	1(1)
CRED_GENCOM	-10.23253	-2.938987*	0.0000	1(1)
CRED_SERV	-6.510349	-2.938987*	0.0000	1(1)
CRED_PUBSEC	-4.572140	-2.938987*	0.0007	1(1)

Computed by the author from E-views results of ADF tests.

*Indicates stationarity at the 1%, 5% and 10% levels of significance.

The above table of results clearly shows that the variables were differenced at first difference to arrive at a stationary level. Thus, the null hypotheses that the series has no unit root are rejected at the 1%, 5% and 10% levels. We then concluded that the variables of the model have unit root and are integrated of order one, 1(1).

4.1.2. Co-Integration Test Results

Having established the presence of a unit root, the study proceeded to perform Co-integration tests using the Engle and Granger Co-Integration procedure to ascertain if a long-run relationship exists among the series. The E-views output of the Co-integration test results were as follows:

Table 2. Results of Co-integration Test (Ulasi Joshua Ikechukwu, 2025, 9)

Variables Probability	t-statistic	Probability	z-statistic
CRED_PROD 1.0000	-3.86649	0.3786	9.62079
CRED_GENCOM	-9.59983 0.0000	0.0000	-56.2665
CRED_SERV 0.8410	-2.27536	0.9486	-10.98041
CRED_PUBSEC 0.0008	-2.67139	0.8666	-13.2548
TOTALCRED	-5.84147 0.0081	0.0126	-38.0164
GDP 0.0117	-5.25311	0.0402	-35.5558

Computed by the author from E-views results of the Engel and Granger Co-Integration tests.

The above results indicate that the variables are not co-integrated, and hence, the rejection of the null hypothesis at 5% level of significance.

4.2.Evaluation of results

Evaluation of Results Based on Economic Criterion (A priori Expectations)

This subsection is concerned with evaluating the regression results based on a priori expectations. The signs and magnitude of the variable coefficient were evaluated against theoretical expectations. The e-views output of the model estimation is presented in the table below.

Table 3. Results of Regression Analysis (Ulasi Joshua Ikechukwu, 2025, 10)

Variables Probability	Coefficient	Std. Error	T-statistic
CRED_PROD 0.0002	12.19	2.87	4.24
CRED_GENCOM	-2.79 0.1260	0.91	-1.56
CRED_SERV 0.5635	-1.42	4.79	-0.58
CRED_PUBSEC 0.0928	-3.49	2.03	-1.72
TOTALCRED	4.57 0.0000	0.72	6.32
C 0.4512	1435.74	1884.51	0.76

Computed by the author from E-views results of Regression analysis.

Constant: From the regression results in Table 4.2, a positive but insignificant value of the constant is observed. The constant term was estimated at 1435.75, which indicated that the model passed through the point 1435.75. The implication is that when total credit offered by deposit money banks is zero, then GDP would be ₦1,435.75 trillion.

Total Credit: The total credit offered by Deposit Money Banks has an a priori positive relationship with Gross Domestic Product. The regression results confirmed the a priori expectation with a coefficient of Total Credit at 4.576. This implies that a unit increase in Deposit Money Bank Loans would, *ceteris paribus*, bring about a 4.576 increase in Gross Domestic Product, which is a proxy for measuring economic growth.

Evaluation of Results Based on Statistical Criterion

This subsection utilizes the results of R^2 tests, t-tests, and F tests in establishing the reliability of the estimated parameters.

- **R^2 : Result and Interpretation**

From the estimated equation, the R^2 result, which is also called the coefficient of determination, is given as 0.970, which implies that 97 percent of the variations in Gross Domestic Product are explained by variations in Volume of Deposit Money Bank Lending.

- **Result and Interpretation of the T-test of Significance**

T-tests of significance are usually applied to economic variables, especially when the sample sizes are greater than or equal to 30. T-test results of 6.327 far exceed the acceptance region at 5% level of significance, hence the rejection of the Null hypothesis. This is further confirmed by the probability results of 0.000, which is statistically significant at 5% level.

$t_{cal} > t_{tab}$ at 5% level of significance. Therefore, we reject the null hypothesis.

- **Result and Interpretation of F-test of Significance**

From the estimated equation, the F-statistic value is 233.44 with a probability of 0.000, which indicates statistical significance at 5% level of significance. Hence $f_{cal} > f_{tab}(0.05)$. This also suggests the rejection of the null hypothesis.

Evaluation of Results Based on Econometric Criterion

Econometric models differ from statistical and other mathematical models due to the presence of the disturbance (error) term. This section explores the subsection of our model to autocorrelation, normality, and heteroscedasticity tests.

- **Results and Interpretation of Autocorrelation Test**

The Durbin-Watson test was adopted for this test. The D-W test statistic compares the upper limit d_u to the lower limit d_L based on 5% level of significance and k degrees of freedom (k is the number of dependent variables without the constant). From the E-views output, the estimated d value is 1.6878. From the Durbin-Watson tables, we find that for 41 observations and one explanatory variable, $d_L = 1.442$ and $d_u = 1.544$ at the 5 percent level. Since the computed d of 1.6054 lies above both d_L and d_u we reject the hypothesis that there is both positive and negative serial correlation in the residuals.

- **Results and Interpretation of Normality Test**

The Jarque-Bera (JB) normality test was adopted for this test. The JB test follows a Chi-square distribution with 2 degrees of freedom (2df).

H_0 : The random variables are not normally distributed.

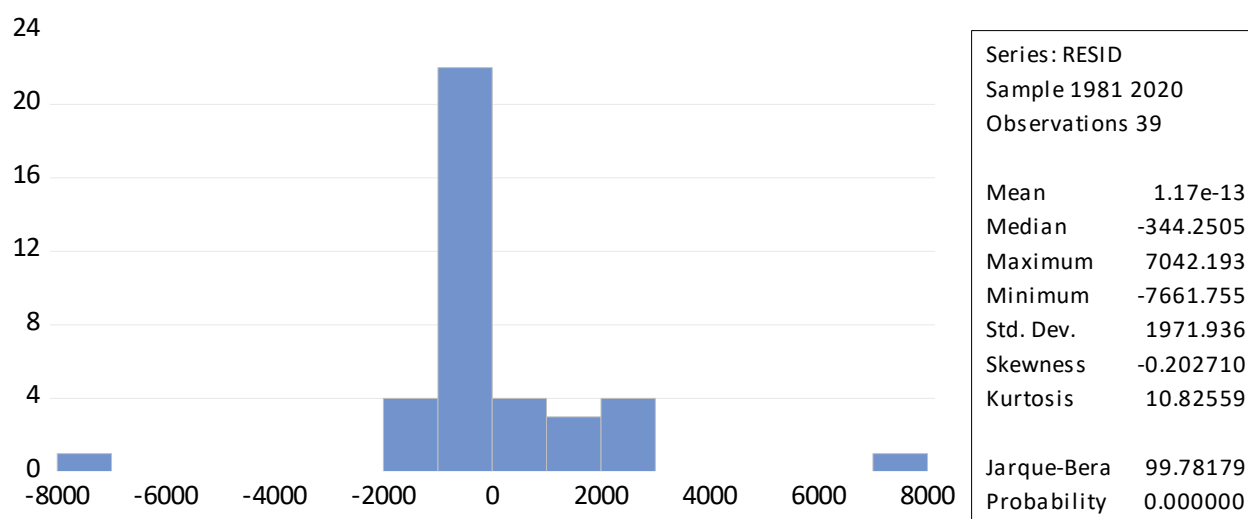
H_1 : The random variables are normally distributed.

Decision Rule

Reject H_0 if $JB_{cal} > JB_{tab}$ (2df); else do not reject H_0 at 5% level of significance.

$JB_{cal} = 99.781$

$JB_{tab 0.05} (2df) = 5.99$

Figure 1. Results of Normality Test (Ulasi Joshua Ikechukwu, 2025, 11)

From the E-views results, Jarque-Bera (JB_{cal}) $99.781 > (JB_{tab})_{0.05} 5.99$.

$99.781 > 5.99$ at 5% level of significance.

Hence, we reject the null hypothesis and conclude that the random variables are not generally distributed at 5% critical level.

- **Results and Interpretation of Heteroscedasticity Test**

This test was conducted using White's General Heteroscedasticity test, in which the residuals follow a chi-square (χ^2) distribution with degrees of freedom equal to the number of independent variables (excluding the constant).

Hypotheses:

H_0 : The residuals have equal spread/variances (Homoscedasticity).

H_1 : The residuals do not have equal spread/variances (Heteroscedasticity).

Decision rule:

Reject H_0 if $n \cdot R^2 > \chi^2_{tab}$ at 5% level of significance. Otherwise, do not reject H_0 .

$n=40$

R^2 = (from regression results)

Therefore, $n \cdot R^2 = 40(0.939) = 37.56$

χ^2_{tab} at 5% level of significance with degrees of freedom (df) 1 from chi-square distribution table = 3.841.

Since the results, $n \cdot R^2 > \chi^2_{tab}$ (0.05), we reject the null hypothesis and conclude that the residuals do not have equal spread/variance.

- **Results and Interpretation of the Granger Causality Test**

The reason for a causality test is to ascertain whether or not a causal relationship exists between Deposit Money Bank loans and economic growth (using GDP as a proxy).

H_0 : There is no causal relationship between the variables.

H_1 : There is a causal relationship between the variables.

Decision rule:

Compare the f-computed $|F_{cal}|$ and f-tabulated (critical) value $|F_{tab}|$ at a chosen level of significance.

Reject the null hypothesis (H_0) if $|F_{cal}| > |F_{tab}|$ at the chosen level of significance, say 5% critical level. Otherwise, do not reject H_0 .

The results of the Granger causality tests are summarized in the appendix:

4.3. Test of Hypotheses

- (i) H_0 : Deposit Money Bank loans to the Production sector, Public sector, and General commerce have no significant impact on economic growth in Nigeria.

H_1 : Deposit Money Bank loans to the Production sector, Public sector, and General commerce have a significant impact on economic growth in Nigeria.

From the results in the above table, and based on the decision rule, I rejected the null hypothesis (H_0) that Deposit Money Bank Loans to Production sector (Credit_Prod), Public Sector (Credit_Pubsec), and General commerce (Credit_Gencom) do not Granger-cause GDP. Hence, I accepted the alternative hypothesis (H_1) and concluded that Deposit Money Bank Loans to the Production sector (Credit_Prod), the Public Sector (Credit_Pubsec), and for General commerce (Credit_Gencom) have a significant impact on GDP.

Decision Rule: Reject H_0 . Hence, conclude that Deposit Money Bank loans to the Production sector (Credit_Prod), the Public Sector (Credit_Pubsec), and for General commerce (Credit_Gencom) have a significant impact on GDP.

- (ii) H_0 : There is no causal relationship between Deposit Money Bank loans and economic growth in Nigeria.

H_1 : There is a causal relationship between Deposit Money Bank loans and economic growth in Nigeria.

The critical F-value (5%) = 2.64. From the E-views output, and given the decision rule, I concluded that Deposit Money Bank loans to the Public Sector do not cause loans to the Production Sector. Loans to the production sector do not cause loans to the General Commerce sector and vice versa. Loans to the services sector do not cause loans to the commercial industry and vice versa. What this means is that there is no relationship between loans offered to the various sectors of the Nigerian economy by Nigerian banks. An a priori expectation would have been that if commercial banks provide loans to, say, the public sector, there would be fewer loanable funds available to be offered as loans to other sectors of the economy. However, contrary to a priori expectations, Nigerian bank loans to the various sectors had no causality relationships.

4.4. Discussion of Major Findings

The study revealed unit roots for the four explanatory variables. Jonhansen's Cointegration tests also suggested rejection of the null hypotheses at 5% level of significance.

The study recorded negative values for the coefficients of the General Commerce and Services sector. This holds significant implications for the study, as a negative relationship did not follow the earlier a priori expectation stated in section 3.4.

Loans offered to the production and public sectors of the Nigerian economy for the period under study increased the country's gross domestic product. In contrast, loans provided to the services and general commerce sectors (as categorized by the Central Bank of Nigeria) did not contribute the expected volumes to the gross domestic product in the period under study.

A possible explanation of this may be seen from the fact that loans for commerce and services may not be directly channeled towards domestic production, but are generally used for imports (as Nigeria is a net importer of goods and services), which do not really increase the country's GDP. Making loans available to these two sectors drastically reduces the loanable funds available for the productive sector; hence, the negative values. This seemed to be in line with the findings of Onuora and Ozurumba (2013), which provided some evidence to suggest that commercial bank loans do not cause economic growth in Nigeria.

Earlier studies had favoured more bank loans to the private sectors of various economies, given that loans to the private sectors led to more economic growth. Mushin and Eric (2000), Mishra et al. (2009), Vazakidis and Adamopolous (2009), and Adamopolous (2010) supported this view in their earlier studies.

5. CONCLUSION

So far, the study has evaluated the loans offered by Deposit Money Banks to selected four sectors of the Nigerian economy and their impact on the Nigerian Gross Domestic Product. The study found that Deposit Money Bank loans to the Public sector, Production sector, and General commerce have a significant impact on Gross Domestic Product in Nigeria. The Gross Domestic Product was used as a proxy for economic growth in Nigeria. The study interestingly revealed that Deposit Money Bank loans to the Public sector increased economic growth.

The study started by examining the impact of Deposit Money Bank lending on economic growth in Nigeria. From the findings of the research and the tested hypothesis, a conclusion was drawn that DMBs' credit has a significant impact on economic growth in Nigeria. In other words, the Nigerian banking sector, being the chief source of credit to the various sectors, is an important channel of financial intermediation through which loanable funds may increase both investments and economic growth.

Recommendations

- Since bank loans contribute to economic growth, loans that meet the bank requirements in Nigeria need to be approved so that the funds can be invested into profitable ventures that will yield economic growth.
- To reduce the debt burden on the borrowers, lending rates have to be adjusted downwards (especially to the more productive sectors) to increase the volume and frequency of bank loans to the various sectors of the Nigerian economy.
- More loans need to be approved for the more productive sectors of the Nigerian economy

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APPENDIX I

Table 4.3: GDP and DMB Loans from 1981 to 2021

YEAR	GDP	CREDIT_PROD	CREDIT_GENCOM	CREDIT_SERV	CREDIT_PUBSEC	TOTAL CREDIT
1981	139.31	5.2	1.4	1.2	0.8	8.6
1982	149.05	6	1.9	1.3	1.2	10.3
1983	158.75	6.4	1.7	1.7	1.3	11.1
1984	165.85	6.8	1.8	1.7	1.3	11.5
1985	187.83	7.2	2	1.4	1.4	12.2
1986	198.12	9.3	2.7	1.7	1.8	15.7
1987	244.68	10.5	3.1	2.1	1.8	17.5
1988	315.62	12.4	3.6	1.4	2.2	19.6
1989	414.86	13.7	4.2	1.5	2.7	22
1990	494.64	15.7	4.8	1.8	3.6	26
1991	590.06	20	5	2.1	4.1	31.2
1992	906.03	27.3	7.3	2.7	5.4	42.7
1993	1257.17	40.7	13.5	4.5	7	65.7
1994	1768.79	52.6	7.6	0	34	94.2
1995	3100.24	95.5	19.4	0	29.7	144.6
1996	4086.07	120.5	33	0	15.9	169.4
1997	4418.71	131.3	16.4	0	237.8	385.6
1998	4805.16	146.7	29.8	0	96.4	272.9
1999	5482.35	171.5	18.8	0	132.5	322.8
2000	7062.75	214.6	25.3	0	268.4	508.3
2001	8234.49	333.2	34.5	0	428.4	7936.2
2002	11501.45	363.5	26.7	0	564.4	954.6
2003	13556.97	452.4	34.5	0	723.2	1210.6
2004	18124.06	530.9	31.3	0	957	1519.2
2005	23121.88	573.1	26.4	0	1377.2	1976.7
2006	30375.08	746.7	52.7	0	1724.9	2524.3
2007	34675.94	1127.9	66.6	0	3619.1	4813.5
2008	39954.21	2352.9	220.1	1889.8	3336.6	7799.4
2009	43461.46	3098	12451.1	2082	2487.1	8912.1
2010	55469.35	2964.4	943.2	1743	2055.7	7706.4
2011	67713.36	3057.2	791.9	1638.8	1824.9	7312.7
2012	72599.63	3695.96	756.57	1244.6	2452.89	8150.03
2013	81009.96	4062.47	1155.77	1930.13	2902.6	10005.59
2014	90136.98	4467.9	2333.42	1400.78	4687.31	12889.42
2015	95177.74	4349.31	2440.32	1557.75	4277.8	13086.2
2016	102575.42	6235.93	2977.84	1816.12	4540.15	16117.29
2017	114899.25	6201.6	3072.24	1952.08	3961.18	15740.59
2018	129086.91	6182.5	3053.81	1786.45	3480.6	15134.2
2019	145639.14	6412.01	3518.74	1935.41	4546.9	17187.77
2020	154252.32	7564.88	4082.81	2198.94	5465.3	20733.49
2021	154252.32	5017.63	5126.77	2468.58	1465.75	24371.19

Source: Computations from CBN Statistical Bulletins 2014 and 2021 from www.cenbank.org

APPENDIX II

RESULTS OF REGRESSION ANALYSIS

Dependent Variable: GDP

Method: Least Squares

Date: 11/18/22 Time: 13:40

Sample: 1981 2021

Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1435.745	1884.510	0.761866	0.4512
CREDIT_PROD	12.19371	2.875543	4.240490	0.0002
CREDIT_SERV	-2.794839	4.792656	-0.583150	0.5635
CREDIT_GENCOM	-1.429308	0.911948	-1.567314	0.1260
CREDIT_PUBSEC	-3.499883	2.025428	-1.727972	0.0928
TOTAL_____CREDIT	4.576045	0.723232	6.327218	0.0000
R-squared	0.970888	Mean dependent var	37578.95	
Adjusted R-squared	0.966729	S.D. dependent var	50296.82	
S.E. of regression	9174.361	Akaike info criterion	21.22067	
Sum squared resid	2.95E+09	Schwarz criterion	21.47144	
Log likelihood	-429.0238	Hannan-Quinn criter.	21.31199	
F-statistic	233.4471	Durbin-Watson stat	1.687816	
Prob(F-statistic)	0.000000			

APPENDIX III

RESULTS OF UNIT ROOT TESTS

Null Hypothesis: D(CREDIT_SERV) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.510349	0.0000
Test critical values: 1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CREDIT_SERV,2)

Method: Least Squares

Date: 11/18/22 Time: 13:51

Sample (adjusted): 1983 2021

Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CREDIT_SERV(-1))	-1.072077	0.164673	-6.510349	0.0000
C	67.32530	58.18235	1.157143	0.2546
R-squared	0.533915	Mean dependent var		6.911282
Adjusted R-squared	0.521318	S.D. dependent var		518.4474
S.E. of regression	358.6974	Akaike info criterion		14.65276
Sum squared resid	4760562.	Schwarz criterion		14.73807
Log likelihood	-283.7287	Hannan-Quinn criter.		14.68336
F-statistic	42.38464	Durbin-Watson stat		2.008031
Prob(F-statistic)	0.000000			

Null Hypothesis: D(CREDIT_PROD) has a unit root

Exogenous: Constant

Lag Length: 9 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.808956	0.8021
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CREDIT_PROD,2)

Method: Least Squares

Date: 11/18/22 Time: 13:48

Sample (adjusted): 1992 2021

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CREDIT_PROD(-1))	-0.348707	0.431059	-0.808956	0.4286
D(CREDIT_PROD(-1),2)	-0.271741	0.479885	-0.566261	0.5778
D(CREDIT_PROD(-2),2)	-0.262985	0.535016	-0.491547	0.6287
D(CREDIT_PROD(-3),2)	-0.502768	0.557571	-0.901712	0.3785
D(CREDIT_PROD(-4),2)	-0.174843	0.580542	-0.301172	0.7666
D(CREDIT_PROD(-5),2)	-0.900707	0.594712	-1.514526	0.1464
D(CREDIT_PROD(-6),2)	-0.235835	0.570598	-0.413311	0.6840
D(CREDIT_PROD(-7),2)	-1.535715	0.550243	-2.790977	0.0117
D(CREDIT_PROD(-8),2)	1.045518	0.492990	2.120767	0.0473
D(CREDIT_PROD(-9),2)	-1.626760	0.574864	-2.829819	0.0107
C	112.7824	105.4947	1.069080	0.2984
R-squared	0.878866	Mean dependent var	-85.04500	
Adjusted R-squared	0.815111	S.D. dependent var	920.8813	
S.E. of regression	395.9675	Akaike info criterion	15.07712	
Sum squared resid	2979014.	Schwarz criterion	15.59089	
Log likelihood	-215.1567	Hannan-Quinn criter.	15.24148	
F-statistic	13.78507	Durbin-Watson stat	1.112199	
Prob(F-statistic)	0.000001			

Null Hypothesis: D(CREDIT_GENCOM) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-10.23253	0.0000
Test critical values: 1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CREDIT_GENCOM,2)

Method: Least Squares

Date: 11/18/22 Time: 13:53

Sample (adjusted): 1983 2021

Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CREDIT_GENCOM(-1))	-1.479270	0.144565	-10.23253	0.0000
C	181.5633	390.4361	0.465027	0.6446
R-squared	0.738893	Mean dependent var		26.75538
Adjusted R-squared	0.731837	S.D. dependent var		4704.962
S.E. of regression	2436.441	Akaike info criterion		18.48438
Sum squared resid	2.20E+08	Schwarz criterion		18.56970
Log likelihood	-358.4455	Hannan-Quinn criter.		18.51499
F-statistic	104.7046	Durbin-Watson stat		2.290422
Prob(F-statistic)	0.000000			

Null Hypothesis: D(CREDIT_GENCOM) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-10.23253	0.0000
Test critical values: 1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CREDIT_GENCOM,2)

Method: Least Squares

Date: 11/18/22 Time: 13:53

Sample (adjusted): 1983 2021

Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CREDIT_GENCOM(-1))	-1.479270	0.144565	-10.23253	0.0000
C	181.5633	390.4361	0.465027	0.6446
R-squared	0.738893	Mean dependent var		26.75538
Adjusted R-squared	0.731837	S.D. dependent var		4704.962
S.E. of regression	2436.441	Akaike info criterion		18.48438
Sum squared resid	2.20E+08	Schwarz criterion		18.56970
Log likelihood	-358.4455	Hannan-Quinn criter.		18.51499
F-statistic	104.7046	Durbin-Watson stat		2.290422
Prob(F-statistic)	0.000000			

APPENDIX IV

RESULTS OF GRANGER CAUSALITY TESTS

Pairwise Granger Causality Tests

Date: 11/18/22 Time: 14:03

Sample: 1981 2021

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
CREDIT_GENCOM does not Granger Cause CREDIT_PROD	39	0.34470	0.7109
CREDIT_PROD does not Granger Cause CREDIT_GENCOM		14.2993	3.E-05
CREDIT_SERV does not Granger Cause CREDIT_PROD	39	1.72619	0.1932
CREDIT_PROD does not Granger Cause CREDIT_SERV		4.68676	0.0159
CREDIT_PUBSEC does not Granger Cause CREDIT_PROD	39	7.31086	0.0023
CREDIT_PROD does not Granger Cause CREDIT_PUBSEC		2.85896	0.0712
TOTAL_____CREDIT does not Granger Cause CREDIT_PROD	39	0.28778	0.7517
CREDIT_PROD does not Granger Cause TOTAL_____CREDIT		3.59235	0.0384
GDP does not Granger Cause CREDIT_PROD	39	1.99775	0.1512
CREDIT_PROD does not Granger Cause GDP		3.11857	0.0571
CREDIT_SERV does not Granger Cause CREDIT_GENCOM	39	84.2024	7.E-14
CREDIT_GENCOM does not Granger Cause CREDIT_SERV		0.21911	0.8044
CREDIT_PUBSEC does not Granger Cause CREDIT_GENCOM	39	22.4569	6.E-07
CREDIT_GENCOM does not Granger Cause CREDIT_PUBSEC		0.64396	0.5315
TOTAL_____CREDIT does not Granger Cause CREDIT_GENCOM	39	9.80610	0.0004
CREDIT_GENCOM does not Granger Cause TOTAL_____CREDIT		0.87592	0.4257
GDP does not Granger Cause CREDIT_GENCOM	39	6.82956	0.0032
CREDIT_GENCOM does not Granger Cause GDP		8.62396	0.0009
CREDIT_PUBSEC does not Granger Cause CREDIT_SERV	39	20.1396	2.E-06
CREDIT_SERV does not Granger Cause CREDIT_PUBSEC		0.22726	0.7979
TOTAL_____CREDIT does not Granger Cause CREDIT_SERV	39	4.07123	0.0260
CREDIT_SERV does not Granger Cause TOTAL_____CREDIT		0.46874	0.6298
GDP does not Granger Cause CREDIT_SERV	39	4.40116	0.0200
CREDIT_SERV does not Granger Cause GDP		1.75087	0.1889
TOTAL_____CREDIT does not Granger Cause CREDIT_PUBSEC	39	0.51637	0.6013
CREDIT_PUBSEC does not Granger Cause TOTAL_____CREDIT		5.74530	0.0071
GDP does not Granger Cause CREDIT_PUBSEC	39	7.23567	0.0024
CREDIT_PUBSEC does not Granger Cause GDP		3.52021	0.0408
GDP does not Granger Cause TOTAL_____CREDIT	39	14.2722	3.E-05
TOTAL_____CREDIT does not Granger Cause GDP		2.40714	0.1053

APPENDIX V RESULTS OF COINTEGRATION TESTS

Date: 11/18/22 Time: 17:02

Series: CREDIT_PROD CREDIT_GENCOM CREDIT_SERV CREDIT_PUBSEC TOTAL_____CRED...

Sample: 1981 2021

Included observations: 41

Null hypothesis: Series are not cointegrated

Cointegrating equation deterministics: C

Automatic lags specification based on Schwarz criterion (maxlag=9)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
CREDIT_PROD	-3.866496	0.3786	9.620796	1.0000
CREDIT_GENCOM	-9.599838	0.0000	-56.26658	0.0000
CREDIT_SERV	-2.275365	0.9486	-10.98041	0.9210
CREDIT_PUBSEC	-2.671392	0.8666	-13.25482	0.8410
TOTAL_____C...	-5.814769	0.0126	-38.01645	0.0081
GDP	-5.253113	0.0402	-35.55857	0.0177

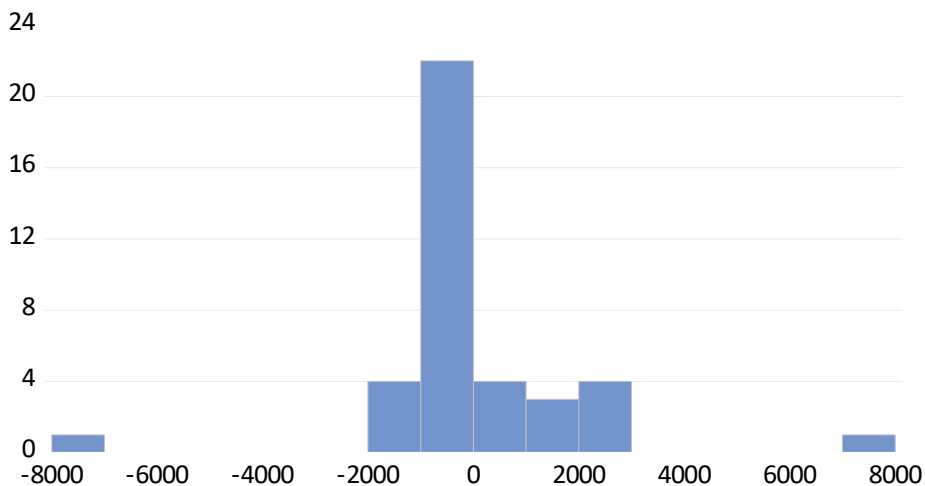
*MacKinnon (1996) p-values.

Intermediate Results:

	CREDIT ...	CREDIT G...	CREDIT ...	CREDIT ...	TOTAL ...
Rho - 1	-0.979571	-1.406665	-0.410874	-0.331370	-0.950411
Rho S.E.	0.253349	0.146530	0.180575	0.124044	0.163448
Residual variance	69841.35	2024917.	73746.53	276560.3	1920072.
Long-run residual variance	6579.042	2024917.	34628.29	276560.3	1920072.
Number of lags	8	0	1	0	0
Number of observations	32	40	39	40	40
Number of stochastic trends**	6	6	6	6	6

**Number of stochastic trends in asymptotic distribution

Appendix VI RESULTS OF NORMALITY TEST



Series: RESID	
Sample 1981 2020	
Observations 39	
Mean	1.17e-13
Median	-344.2505
Maximum	7042.193
Minimum	-7661.755
Std. Dev.	1971.936
Skewness	-0.202710
Kurtosis	10.82559
Jarque-Bera	99.78179
Probability	0.000000