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TIME SERIES ANALYSIS OF CREDIT FACILITIES OF SELECTED BANKS AND ECONOMIC GROWTH IN NIGERIA (1988-2023)

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Abstract

This study investigates a time series analysis of credit facilities provided by banks and their impact on economic growth in Nigeria from 1988 to 2023. Using secondary data on Real Gross Domestic Product (RGDP), Commercial Bank Credit (CBC), Interest Rate (INTR), and Broad Money Supply (M2) sourced from the Central Bank of Nigeria (CBN) statistical bulletin, this study examines the long-run equilibrium relationship (cointegration) among these variables. A multiple regression model is developed, and econometric techniques are employed, including the Augmented Dickey-Fuller (ADF) test, Johansen Co-integration Test, and Error Correction Model (ECM).

The findings revealed that although M2 has a significant short-term impact on RGDP, CBC, and INTR exhibit an insignificant effect. The Johansen Co-integration Test confirms a long-term equilibrium relationship among variables, whereas the Granger Causality Test indicates that M2 Granger-causes RGDP. Despite challenges such as autocorrelation and non-normality in residuals, appropriate econometric corrections, including heteroscedasticity and autocorrelation consistency (HAC) methods, were applied to ensure model reliability.

This study concludes that a broad money supply (M2) is a crucial driver of economic growth in Nigeria, emphasising the need for effective monetary policy to stimulate sustainable economic development. However, commercial bank credit and interest rates require strategic reforms to enhance their contribution to economic growth. The findings provide valuable insights for policymakers, financial institutions, and stakeholders in addressing the dynamics of credit facilities and economic performance in Nigeria.

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INTRODUCTION

Deposit money banks are resident depository corporations and quasi-corporations that have any liabilities in the form of deposits payable on demand, transferable by cheque, or otherwise usable for making payments. A growing body of work in advanced economies has demonstrated that deposit money bank credits are among the greatest drivers of economic growth and development. Thus, most countries with well-functioning financial systems and large deposits of deposits on bank credit are characterised with substantial and sustained growth as well as economic development (Nabila Zakir,2014, Sunde 2013). This suggests that as an economy becomes large, there is an increasing need for increased and targeted deposit money banks to critical sectors of the economy, including households.

This banking institution is responsible for financial intermediation in the Nigerian financial system, which enables the channelling of fund from the surplus unit of the economy to the deficit unit of the same economy, thereby transforming deposits to credit (loan). According to Ademu (2006) in Nwanyanwu (2010), providing credit with sufficient consideration for growth potential in the sector as well as price system in the economy is one way to generate employment opportunities and, by so doing, contribute to the growth of the economy at large. This can be made possible because bank credit contributes immensely to the expansion of business enterprises and increases production scale, which results in growth in the overall economy.

Ademu (2006) highlighted the role of bank credit and explained that it can be used to prevent economic activity from collapse in the event of natural disasters, such as floods, droughts, diseases, or fires. The importance of bank credit to the Nigerian economy has led to a sustained increase in credit to productive sectors of the Nigerian economy. The Central Bank of Nigeria's annual report (2010) noted that credit to the core private sector for deposit money banks increased by 10.26% between 2009 and 2010. In making credit available, banks are rendering great social services because through their actions, production is increased, capital investments are expanded, and a higher standard of living realised.

The concept of economic growth is viewed as an increase in the net national product in each period (Dewett 2005). He explained that economic growth is generally referred to as a quantitative change in economic variable, normally persisting over successive periods. The role of credit in economic growth has been recognised as credits are obtained by various economic agents to enable them to meet operating expenses (Nwanyanwu 2008). Furthermore, according to Ademu (2006), the provision of credit with sufficient consideration for a sector's volume and price system is a way of achieving economic growth through self-employment opportunities while highlighting the role of credit in the growth of any economy. (Shaw, 1973; Mckinnon 1973) economic growth is an important factor that improves living standards in developing countries. It is an indispensable requirement for economic development. Among other factors, it is believed that the main factors affecting economic growth are labour, capital, and exogenously determined technology. The impact of deposit money bank credits is relevant to the economic growth of Nigeria.

In this paper, we present the following points:

1. Commercial Bank Loans (Credit)

Bank credit is the aggregate amount of credit available to a person or business from a banking institution. The sum of funds that financial institutions provide to an individual or business. A business or individual's bank credit depends on the borrower's ability to repay the loan and the total amount of credit available in the bank.

Bank loans to an individual or business (the borrower) from a commercial bank, savings bank, etc. (the lender). A bank loan is a type of credit that is often extended for a specified period, usually on fixed-interest terms related to the base interest rate, with the principal being repaid either on a regular instalment basis or in full on the

appointed redemption date. Alternatively, a bank loan may take the form of overdraught facilities under which customers can borrow up to a pre-arranged total limit and are charged interest on outstanding balances. In the case of business borrowers, bank loans are used to finance working capital requirements and are often renegotiated shortly before expiring to provide the borrower with a 'revolving' line of credit.

Depending on the nature of the loan and the degree of risk involved, bank loans may be unsecured or secured; the latter requires the borrower to deposit with the bank's collateral security (e.g. title deeds to a house) to cover against default on the loan (Lowes L. Davies, 2005).

2. Concept of Economic Growth

Economic growth is simply a sustained increase in the output of goods and services of a country over a period. This serves as a yardstick through which the economic performances of a country or different nations are measured. Therefore, a country can be judged as high or poor based on the rate of economic growth during any period. Gross domestic product (GDP) is the measure of the flow of output of final goods and services at either market prices or an adjusted value (i.e. real gross domestic product) resulting from current production during a year in each country.

The International Monetary Fund (2009) and the Central Bank (2010) stated that economic growth is an increase in the amount of goods and services produced in an economy over time. Conventionally, it is measured as the percentage increase in real gross domestic product, or real GDP (RGDP). Growth is usually calculated in real terms i.e. inflation- adjusted terms, to determine the effect of inflation on the price of the goods and services produced. The drivers of economic growth in an economy, as posited by Dwivedi(2008) are the quality of the labour force, natural resources, capital formation, technological development, and political and social factors while Riley(2012) noted that the determinants are growth in physical capital stock; growth in the size of active labour force available for production; growth in the quality of human capital; technological progress and innovation; institutions including stable democracy, maintaining rule of law, and macroeconomic stability; and rising demand for goods and services, either led by domestic demand or from external trade.

3. Theories of Bank Credit

i. The Financial Liberalisation Theory

This theory was originally proposed by McKinnon and Shaw. Under this theory, government intervention in financial markets is central to the consideration as a critical setback to growth, investment, and savings mobilisation. The government's role in interest rate control and credit allocation to productive economic sectors in developing countries hinders the mobilisation of savings and discourages financial asset holdings, economic growth, and capital formation. Interest rate ceiling on deposits indirectly inhibited financial saving, resulting in excess liquidity outside the banking industry.

Pervasive government intervention and financial system involvement through supervisory and regulatory frameworks, especially interest rate control and credit allocation, tend to facilitate financial market distortions. Therefore, the government intervention adversely affects the market players 'decision regarding investment and savings and results in financial mediation fragmentation. The resultant effect of this scenario is an economy that is financially repressed.

According to McKinnon and Shaw, the central position is that free markets should determine credit allocation, and financial markets should also be liberalised. Hence, the real interest rate will be adjusted to the equilibrium level and projects with low yields. This will improve overall savings and investment efficiency and increase total real credit supply. In return, this would induce an increased volume of investment that would engender economic growth. The primary critique of the theory of financial liberalisation has been from the paradigm of imperfect

information. The Paradigm of Imperfect information argued with the proponents of financial liberalisation and examines financial development problems in the form of information asymmetry and credit rationing because of expensive information.

According to Stiglitz and Weiss, two critical problems are associated with information asymmetry. The adverse selection of imperfect information paradigm is the first, and the second is moral hazard, that is, the effect of information asymmetries on higher rates of interest, which emanates from financial liberalisation and reform policies, worsens the taking of risk in the economy, and threatens financial system stability, which can easily result in financial crises.

ii. Quantity Theory of Credit

Werner, in his work towards a quantity theory of disaggregated credit and international capital flows, presented the quantity theory of credit, with a central focus on different equations of exchange distinguishing between money used for GDP-transactions and money used for non-GDP transactions. In addition, he stressed that money should not be defined as bank deposits or other aggregates of private sector savings. More so, banks should not be seen as not being financial intermediaries that lend existing money, but rather as creators of new money through lending. In addition, GDP growth requires increased economic transactions, which in turn require larger amounts of money to be used for such transactions; therefore, the amount of money used for transactions can only increase if banks create more credit. Bank credit can be disaggregated into credit for GDP and non-GDP transactions. The former drives nominal GDP, and the latter drives transaction values.

Consequently, the effect of bank credit depends on its quantity and quality, which is defined as whether it is used for unproductive transactions (credit for consumption or asset transactions, producing unsustainable consumer or asset inflation, respectively) or productive transactions (delivering non-inflationary growth). Credit used for productive transactions aims at income growth and is sustainable; credit for asset transactions aims at capital gains and is unsustainable.

iii. Credit Channel Theory

Bernanke and Gertler postulated the credit channel theory. This theory emphasises that the direct effects of monetary policy on interest rates are amplified by endogenous changes in external finance premiums. They described external finance premium as the difference between the cost of funds raised externally and those raised internally by the borrower. Moreover, the imperfection of the credit market depends on the size of the finance premium, and a change in monetary policy that raises or lowers open market interest rates tends to change external finance in the same direction.

In addition, they linked monetary policy and external finance premium through “Balance Sheet Credit Channel” and “Bank Lending Credit Channel”.

iv. Balance Sheet Credit Channel Theory

This theory stresses that the external finance premium faced by borrowers depends on borrower’s financial position. Therefore, the greater the borrower’s net worth, the lower is the external finance premium and overall terms of credit. The theory further stated that the quality of a borrower’s sheet affects their investment and spending decisions. This balance sheet channel arose due to shifts from central bank policies, which not only affected the market interest rate but also the financial positions of borrowers.

v. Bank lending credit channel theory

The banking lending channel stated that monetary policy also affects external finance premiums by shifting intermediate credit supply, especially loans from commercial banks. This indicates that if the supply of bank loans is disrupted for some reason, bank-dependent borrowers may not necessarily be shut off but incur the cost of

finding creditors. Therefore, a reduction in supply relative to other forms of credit is most likely to increase external financing premiums and reduce real activity.

vi. Trends in Commercial Bank Credit to SMEs in Nigeria

The role of SMEs in the industrial and economic development of any nation has been globally recognised, the same is true for a nation like Nigeria. However, Nigeria would have expected a progressive increase in credit allocation to SMEs. The aggregate loans and advances commercial banks extended to SMEs between 1980 and 1999 as a percentage of credit allocated to the private sector shows that between 1980 and 1986, the percentage of credit allocated rose from 1.5% to 9.3%. This period falls within the time when the government has not mandated commercial banks to assign a given percentage of credit to SMEs. A sporadic increase in the SMEs went up as high as 48.80% and 32.20% in 1992 and 1993, respectively. This period also witnessed the period when the government directed commercial banks to mandatorily allocate 20% of their total credit to SMEs. Mandatory credit allocation was abolished in 1996, explaining the downward trend of credit allocation to SMEs from 16.96% in 1997 to 15.30% in 1998, 13.30% in 1990, 8.76% in 2000, 6.59% in 2001, and 8.63% in 2002. Therefore, there is a need to check this downward trend in the percentage of credit allocation to SMEs. The major reasons given for this poor credit given to SMEs apart from government policy include lack of collateral assets, high administrative costs of processing small loans, delay in the disbursement of approved funds, distress in the banking sector coupled with volatile exchange rate regimes, and prohibitive interest rates (Cookey, 2000).

Poor credits reflect the contribution of SMEs (proxies by manufacturing sector) to the total Gross Domestic Product (GDP) of the country. The contribution of SMEs to the total Domestic Production (GDP) of the country rose from 9.89% in 1992 to a low level of 6.02% in 2022. However, there is a steady increase in the percentage contribution to GDP between 1996 and 1999, which reflects the increase in commercial bank credits among other factors allocated to the SMEs sector. This trend suggests that an increase in the contribution of SMEs to the total GDP includes a lack of credit facilities, the inability of small and medium enterprises to transform ideas into reality, poor demand for finished goods, restricted access to land, difficulties in input procurement and a lack of continuity after the death of their owners (Anyanwu, 2003).

4. Theories of Economic Growth

i. Neoclassical Growth Model

Ray (1998) explains that neoclassical growth is an economic theory that outlines how steady economic growth can be accomplished with the proper amounts of the three driving forces labour, capital, and technology. Khan (2003) emphasised that this theory emphasises that technology change has major influence on economic growth. The theory argues that economic growth will not continue without advances in technology.

The neoclassical model of growth was first devised by Nobel Prise winning economist Robert Solow over 40 years ago. Solow-Swam is an economic model of log-run economic growth set within the framework of neoclassical economics. It attempts to explain long-run economic growth by examining capital accumulation, labour or population growth and increases in productivity, commonly referred to as technological progress. Solo believes that a sustained increase in capital to labour increases, but the marginal product of additional units of capital declines, and the economy eventually moves back to a long-term growth path, with real GDP growing at the same rate as the workforce plus a factor to reflect improving productivity. Shaw (1992) proposed a “steady-state growth path” when output, capital and labour are all growing at the same rate, so output per worker and capital per worker are constant. Neoclassical economists who subscribe to the Solow model believe that to raise an economy’s long-term growth trend rate requires an increase in the labour supply and an improvement in the productivity of labour and capital.

ii. Harrod-Domar model

This model was developed independently by Prof. F. Harrod died in 1939, and Evsey Domar died in 1949. Although Harrod-Domar model was created to help the business cycle, it was later adapted to explain economic growth. Its implication was that growth depends on the quality of labour and capital; more investment leads to capital accumulation, which generates economic growth. The model implies that economic growth depends on policies to increase investment by increasing savings and using that investment more efficiently through technological advances.

Solow Swam extended the Harrod-Domar model by adding labour as a factor of production and capital-output ratios that are not fixed as they are in Harrod-Domar model. Harrod-Domar stressed the important of savings and investment as key determinants of growth. The growth of an economy is positively related to its saving ratio and negatively related to the capital-output ratio. This suggests that there is no natural reason for an economy to have balanced growth. This implies that a higher saving rate allows for more investments in physical capital. This investment can increase the production of goods and services, thus increasing its growth. The capital-output ratio shows how much capital is needed to produce a dollar's worth or output. This reflects the efficiency of using machines. This efficiency means that a lower capital-output ratio leads to higher economic growth because fewer inputs generate higher output.

iii. Endogenous Growth Theory

Endogenous growth theory or new growth theory was developed in the 1908s by Romer (1986), Lucas (1988), and Rebelo (1991), among other economics scholars, in response to criticism of the neoclassical growth model. The endogenous growth theory holds that policy measures can impact the long-run growth rate of an economy (Wikipedia, 2013). The growth model is one in which the long-run growth rate is determined by variables within the model, not an exogenous rate of technological progress as in a neo-classical growth model. Jihingan (2006) explained that the endogenous growth model emphasises technical progress resulting from the rate of investment and the size of the capital stock of human capital.

Nnanna *et al* (1993) explained that endogenous growth economists believe that improvement in productivity can be linked directly to a faster pace of innovation and extra investment in human capital. They stressed the need for government and private sector institutions that successfully nurture innovation and provide the right incentives for individuals and businesses to be inventive.

Furthermore, in an endogenous growth model, Nnanna *et al* (2004) observed that financial development can affect growth in three ways: increasing the efficiency of financial intermediation, increasing the social marginal productivity of capital, and influencing the private savings rate (capital formation). This means that a financial institution can affect economic growth by efficiently carrying out its functions, including the provision of credit.

5. Empirical Literature

The government's attempt to strengthen the private sector (manufacturing sector inclusive) led to the government led to the implementation of financial liberalisation policy in 1986 as part of the Structural Adjustment Programme (SAP). The Structural Adjustment Programme (SAP) was an economic reform programme aimed at restructuring the economy and averting economic collapse. The key objectives of SAP are to sustain non-inflationary or minimal inflationary growth and improve the efficiency of the public and private sector. Therefore, the financial liberalisation (reform) policy requires the provision of an appropriate legal and regulatory framework for effective private participation in the economy. The country also adopted a medium-term strategy called the National Economic Empowerment and Development Strategy (NEEDS) in 2004 in response to the numerous challenges facing the nation. Recently, the government approved vision 20-2020 for transforming the country into a modern economy among the 20 leading countries in the world by 2020 (The Times of Nigeria 2008). The objective of the vision 20-2020 is in line with various studies and projections by Goldman Sachs that Nigeria will

be the 20th and 12th largest economy of the World by 2025 and 2050, respectively, ahead of Italy, Canada, and Korea (Skyscraper City 2006), and Africa will be the biggest economy by 2050 (Business Economy, 2008). The vision for 2020 is to be realised through the growth of the private sector. However, as Solanke (2007) argued, the state of the private sector and its characteristics, disposition, and resilience determine in substantial respects how far the lofty objectives of repositioning Nigeria's economy can be achieved. Accordingly, the Nigerian government has also adopted a public–private partnership (PPP) strategy. PPP schemes are designed to significantly improve the quality, availability, and cost-effectiveness of services. These include Service Contracts; Management Contracts; Leases; Build, Operate and Transfer; and Concessions. As a compliment to the various programmes of the government to accelerate the rate of economic growth, it has been suggested that the level of dependence on the oil sector should be reduced, while concentration should be on manufacturing, energy, transport and agriculture (Hale, 2002). This means that efficient allocation of funds to the real sector tends to improve the economy.

Nigerian commercial banks dominate the financial sector and account for a large proportion (above 90%) of transactions within the system. This is measured as a percentage of the total assets of commercial banks to other financial institutions in the system. The above clearly shows that deposit money banks dominate the Nigerian banking scene. Therefore, it is important to study the effectiveness of these banks on the Nigerian economy. There has been renewed interest globally in the study of credit and its ability to generate growth, and the position of this country makes it important to see the contribution of the financial sector to the growth of the economy. This study examines the influence of bank credit on the Nigerian economy using credit to the private sector, credit to the public sector, and the prime lending rate as independent variables and real gross domestic product as dependent variables.

6. Research Design

This study will ascertain a time series analysis of credit facilities on some banks and economic growth in Nigeria over a specified period from 1988 to 2023 and check for long-run equilibrium relationships (co-integration) among the variables.

The research will include an evaluation that would take into cognisance economic/theoretical a priority tests, statistical test of significance, econometric, and other statistical software package is employed in this analysis to test non-violation of the basic assumption of the OLS model.

7. Population, Sample and Sampling techniques

This study builds a multiple regression model and makes use of econometrics to estimate the relationship between economic variables.

The functional form of the model is specified as

RGDP = F (CBR, INTR, M2) …… (3.1)

The mathematical form of the model is specified as

$RGDP = \beta_o + \beta_1 CBC + \beta_2 INTR + \beta_3 M2$……. (3.2)

The econometric form of the model is specified as follows:

$RGDP_t = \beta_{0t} + \beta_1 CBC_t + \beta_2 INTR_t + \beta_3 M2 + \mu_t$…… (3.3)

Where;

RGDP= real gross domestic product i.e. (constant price GDP)

F = functional relationship.

CBC = Commercial bank Credit

INTR = interest rate

M2 = Broad money supply

β_o= Benchmark (RGDP Intercept)

β_1 and β_2 = Slope coefficient

μ= Error term

8. Method of Data collection

The estimated outcomes will be evaluated using three criteria.

i. Preliminary test

ii. Statistical criteria
iii. Econometrics criteria

i. **Preliminary Test**

1. **Stationary (Unit Root) Test:**

The importance of this test cannot be overstated because the data used in the estimation are time-series data. In order not to run a spurious regression, it is worthwhile to carry out a stationary test to make sure that all the variables are mean reverting, that is, they have constant mean, variance, and covariance. In other words, they are stationary. The Augmented Dickey-Fuller (ADF) test was used for this analysis because it adjusts for serial correlation.

The model is expressed as follows.

$$\Delta RGDP_{t-1} = \beta_0 + \beta_1 CBC_{t-1} + \beta_2 INTR_{t-2} + \mu_t$$

Decision Rule: If the ADF test statistic is greater than the MacKinnon critical value at 5% (all in absolute term), the variable is considered stationary. Otherwise, it is nonstationary.

2. **Co-integration Test**

Econometrically speaking, two variables are co-integrated if they have a long-term or equilibrium relationship. Co-integration can be considered a pre-test to avoid spurious regressions situations (Granger, 1986). As recommended by Gujarati (2004), the ADF test statistic is employed for the residual.

The model is expressed as follows.

$$\mu_t = \beta_2 + \beta_1 RGDP_t + \beta_2 CBC + \beta_2 INTR + \beta_3 m2$$

Decision Rule: If the ADF test statistic is greater than the critical value at 5%, then the variables are co-integrated (values are checked in absolute terms).

3. Error Correction Mechanism

If there exist a long run relationship (co-integration) among the time series variables, the Error correction mechanism will be estimated to determine the rate at which the dependent variable returns to equilibrium with the independent variable after some levels of variations i.e. to derive the numerical value of the magnitude of the short-run dynamics or disequilibrium.

The error correction model is described as follows.

$$\Delta RGDP\epsilon_t = \propto_0 + \propto_1 \Delta CBC_t + \propto_2 \Delta INTR_t + \propto_3 \Delta M2 + \epsilon_t$$

ii. Economic criterion Test (A Priori Test)

These are determined by the principles of economic theory and refer to the sign and size of the parameters of the economic relationship.

The expected signs for the parameters associated with various variables are shown below.

VARIABLES	EXPECTED SIGNS
CBR	+
INTR	-
M2	+

iii. Statistical Test of Significance

These are determined by statistical theory and aimed at evaluating the statistical reliability of the estimates of the parameters of the model. The most widely used statistical criteria are the square of the correlation coefficient (coefficient of determination R^2), the t-test, and the f-test of significance.

1. Test for Goodness of Fit

To determine the proportion of variation dependent variable that is attributable to variation in explanatory variable. The value of R^2 ranges between 1 and 0 (ie $0 \leq R^2 \leq 1$). The closer to 1, the better the fit; otherwise, the worse the fit.

2. t-test of Significance

The student t-ratio is used to test the individual statistical significance of the regression coefficient. A two-tail test is conducted at 5% level of significance and n-k degree of freedom (df). Here, n is the number of observations, and K is the estimated parameter.

Decision rule:

The computed(t^*) was computed with the critical t-value ($t_{0.025}$). if $t^* > t_{0.025}$, the H_o was rejected, and H_1 was accepted. Otherwise, H_o is accepted and H_1 is rejected.4

3. f-Test of Significance

The F-test was used to test the overall statistical significance of the independent variables. A single tail test was conducted at a 5% significance level and (V_1/V_2) degree of freedom. Were.

V_1= degree of freedom (df) for the numerator: v_1=k-1.

V_2= degree of freedom (df) for the denominator: v_2=n k

Decision Rule (F-test)

If the $F^* > F_{0.05}$ we will reject the null hypothesis and accept the alternative; otherwise, the alternative hypothesis H_1 is rejected and the null hypothesis H_0 is accepted.

iv. Econometric Test of Significance (Second order Test)

1. Autocorrelation test: The aim of this test is to determine whether the errors corresponding to different observations are serially correlated or not. Uncorrelated errors are desirable. Durbin– Watson (D-W) statistics at 5% will be used to test for the presence of autocorrelation. The region with no autocorrelation remains:

Du> d* > (4-du)

Where:

du = Upper Durbin Watson

d* = Computed Durbin-Watson

Decision Rule:

If the computed value of Durbin-Watson lies within the no autocorrelation region, then there is no autocorrelation problem. However, if the Durbin-Watson computed value lies outside the regions, there is the presence of an autocorrelation problem. If it occurs, to avoid the spurious regression associated with it, we employ the heteroscedasticity autocorrelation correction (HAC) to remove its influence in the model.

2. **Normality test**:

This study conducts a normality test to determine whether the residuals—a proxy for stochastic error term follows normal distribution or not.

The test of normality used in this study is Jarque-Bera (JB) test.

Decision Rule

For the residual to be normally distributed, the K value should be drawn close to or exactly three (3) and S should draw close or exactly zero (0), thus making the JB value close to or equal to zero (0), which is the condition for normal distribution.

3. **Granger causality test**:

Although regression analysis deals with the dependence of one variable on another, it does not necessarily imply causation. In other words, the existence of a relationship between variables cannot prove causality or the direction of influence (Gujarati, 2004). A causal sense of causality analysis using the Granger causality test is to determine whether a causal relationship exists between two variables of interest.

v. **Data required and sources.**

The data required for this study are secondary time series data on commercial bank credit, interest rate, broad money supply, and real gross domestic product (RGDP) ranging from 1992 to 2023. The data were extracted from the 2016 Central Bank of Nigeria (CBN) statistical bulletin.

vi. **Statistical Package**

The statistical package used to analyse the data was E-view 8.

9. Data Presentation

TABLE 4.1. TIME SERIES DATA ON RGDP, CBC, INT, AND M2, DATA RANGING FROM 1988-2023

YEAR	RGDP	CBC	INT	M2
1988	15258	2664.9	8.92	14.47
1989	14985.08	313.1	9.54	15.79
1990	13849.73	1521.2	9.98	17.69
1991	13779.26	1439.7	10.24	20.11
1992	14953.91	2425	9.43	22.30
1993	15237.99	272.5	9.96	23.81
1994	15263.93	482.8	13.96	27.57
1995	16215.37	-3820.8	16.62	38.36
1996	17294.68	-10326	20.44	45.90
1997	19305.63	1932.5	25.3	52.86
1998	19199.06	-7414.3	20.04	75.40
1999	19620.19	230.8	24.76	111.11
2000	19927.99	-53233.5	31.65	165.34
2001	19979.12	647.7	20.48	230.29
2002	20353.2	122138.3	20.23	289.09
2003	21177.92	244975.7	19.84	345.85
2004	21789.1	264651.7	17.8	413.28
2005	22332.87	175626.3	18.18	488.15
2006	22449.41	212922.9	20.29	628.95
2007	23688.28	135673.6	21.27	878.46
2008	25267.54	217647.6	23.44	1,269.32
2009	28957.71	19976.5	24.77	1,505.96
2010	31709.45	38963.6	20.71	1,952.92
2011	35020.55	220800	19.18	2,131.82
2012	37474.95	437000	17.95	2,637.91
2013	39995.5	546403.1	16.9	3,797.91
2014	42922.41	744385.9	16.94	5,127.40
2015	46012.52	1076078	15.48	8,008.20
2016	49856.1	342788	18.36	9,411.11
2017	54612.26	221565.3	17.59	11,034.94
2018	57511.04	546810.3	16.02	12,172.49
2019	59929.89	370387.9	16.79	13,895.39
2020	63218.72	379587.8	16.72	15,160.29
2021	67152.79	387212.8	16.55	17,679.29
2022	69023.93	432623.1	13.6	18,901.30
2023	67931.24	394079.2	14.01	21,607.68

10. Result

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Real Gross Domestic Product (GDP)	36	13779.26	69023.93	31757.1478	18151.71366
Credit to the private sector	36	-53233.50	1076078.00	207484.2556	252512.34135
Interest Rate	36	8.92	31.65	17.6094	5.05081
Broad Money Supply: The Official Data Source	36	14.47	21607.68	4172.1864	6363.74793
Valid N (listwise)	36				

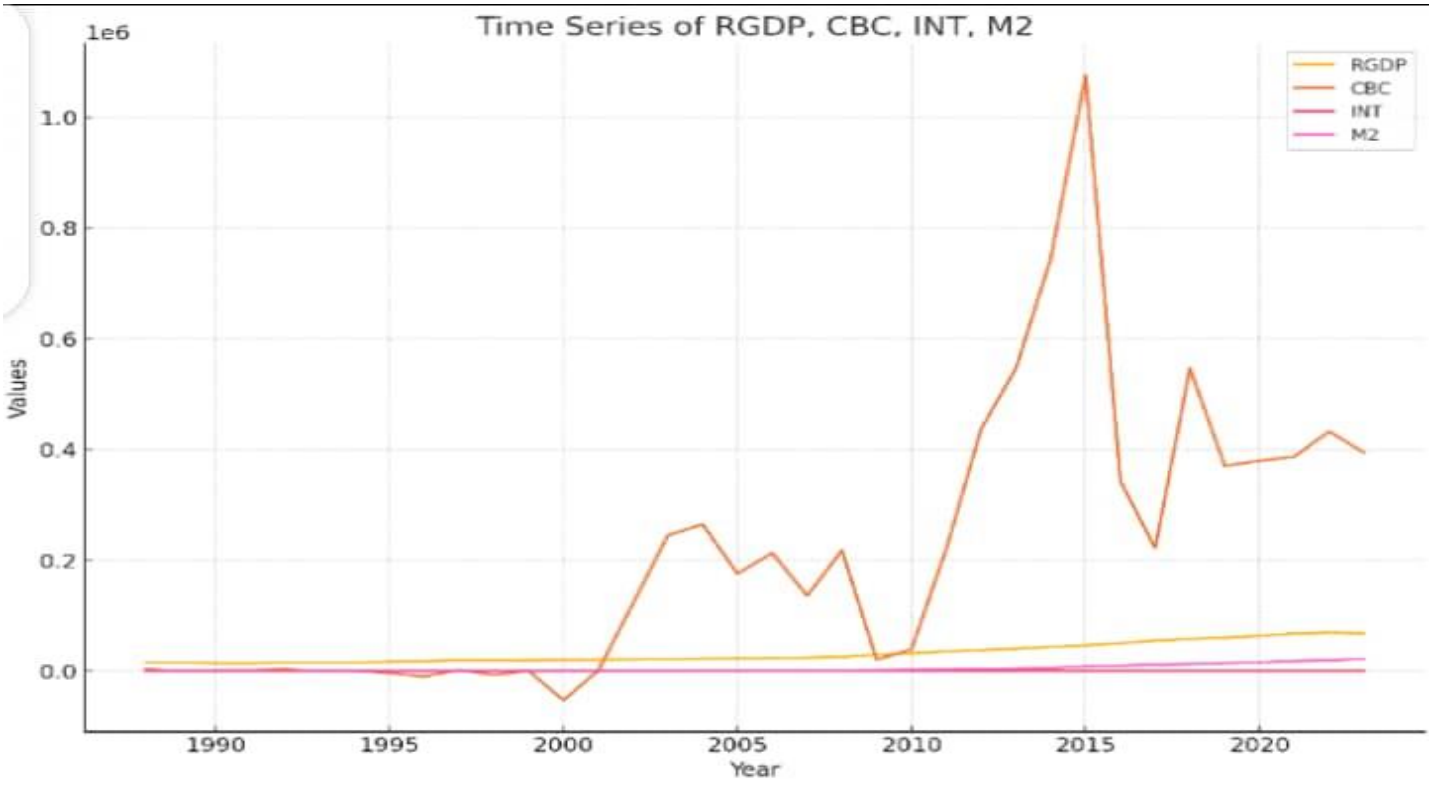


Figure 4.1 Comparative Time Series Analysis of Economic Growth and Financial Indicators in Nigeria (1988-2023)"

Table 4.2a: The **Augmented Dickey-Fuller (ADF) Test** results for stationarity

Variable	ADF Statistic	p-value	Critical Values (5%)
RGDP	-0.709	0.844	-2.951
CBC	1.941	0.999	-2.986
INT	-2.600	0.093	-2.957
M2	3.223	1.000	-2.986

- **RGDP**: The p-value is greater than 0.05, and the ADF statistic is less than the critical value, indicating that the **RGDP is non-stationary**.
- **CBC**: The p-value is also greater than 0.05, indicating **that CBC is nonstationary**.

- **INT**: With a p-value close to 0.093, **INT is close to being stationary**, but it is still considered non-stationary at a 5% significance level.
- **M2**: The p-value is 1.000, and the ADF statistic is positive, indicating **that M2 is non-stationary**.

Table 4.2b: The **Augmented Dickey-Fuller (ADF) Test** results for different variables

Variable	ADF Statistic	p-value	Critical Values (5%)
ΔRGDP	-1.958	0.305	-2.951
ΔCBC	-1.796	0.382	-2.992
ΔINT	-5.061	0.000	-2.954
ΔM2	1.592	0.998	-2.992

- **ΔRGDP** and **ΔCBC**: Both remain non-stationary as their p-values exceed 0.05.
- **ΔINT**: This variable is now **stationary** because the ADF statistic is smaller than the critical value, and the p-value is less than 0.05.
- **ΔM2**: Still non-stationary, with high p-value and positive ADF statistic.

Table 4.3: The **Johansen Co-integration Test**

Rank	Trace Statistic	Critical Value (5%)
0	83.567	47.855
1	33.418	29.796
2	14.868	15.494
3	3.915	3.842

- At **Rank 0**, the trace statistic (83.567) is greater than the critical value (47.855), indicating that **at least one co-integrating relationship** between the variables.
- At **Rank 1**, the trace statistic (33.418) was greater than the critical value (29.796), indicating **two co-integrating relationships**.
- However, at **Rank 2** and **Rank 3**, the trace statistic becomes less than the critical value; thus, there are likely **no additional co-integrating relationships** beyond the first two.

The results suggest that there is **co-integration** between the variables (RGDP, CBC, INT, M2), implying long-term equilibrium.

Table 4.4 Error Correction Model (ECM) Results:

Parameter	Coefficient	t-Statistic	p-Value	95% Confidence Interval
Constant	956.87	3.254	0.003	[357.086, 1556.663]
CBC	-0.0009	-0.614	0.544	[-0.004, 0.002]
INT	-10.4513	-0.134	0.895	[-170.092, 149.189]
M2	0.9067	3.212	0.003	[0.331, 1.482]

- **R-squared**: 0.260, indicating that 26% of the variation in RGDP is explained by the independent variables (CBC, INT, M2).
- **F-statistic**: 3.630 (p-value: 0.0236), indicating that the model is statistically significant at the 5% level.
- **M2** is significant (p-value = 0.003), indicating that changes in **M2** have a significant effect on **RGDP**.

- **CBC** and **INT** were not significant (p-values > 0.05), indicating that changes in **CBC** and **INT** did not have a statistically significant short-term impact on **RGDP**.

i. **Statistical Test of Significance**

a. Test for Goodness of Fit

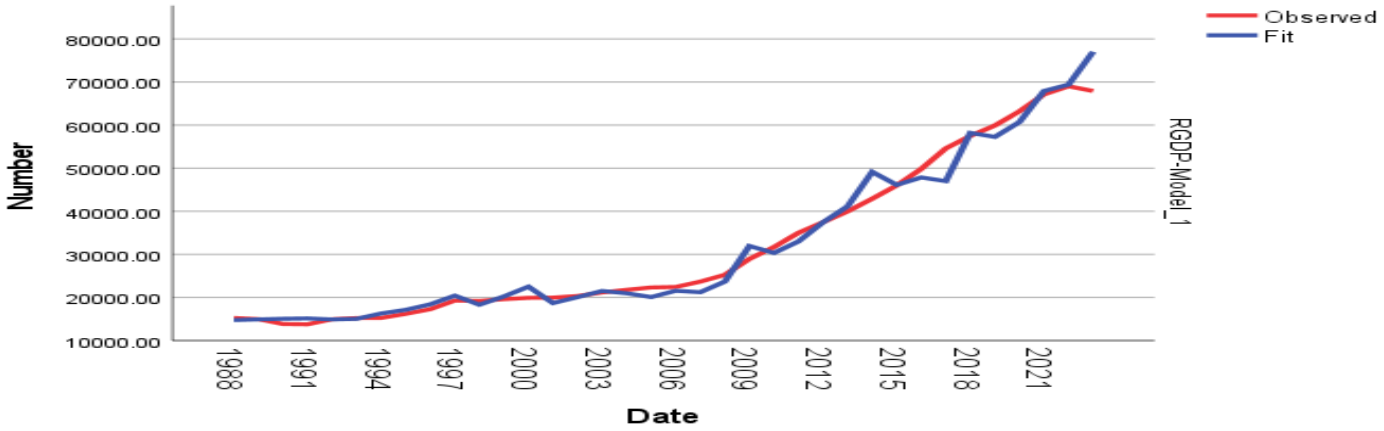


Figure 4.3 Time Series comparison between **Observed** and **Fitted** values of Real Gross Domestic Product (RGDP) from 1988 to 2023.

Table 4.5: Summary of 3 Time Series comparison between **Observed** and **Fitted** values of Real Gross Domestic Product (RGDP) from 1988 to 2023.

Model	Number of Predictors	Model Fit statistics	Ljung-Box Q(18)			Number of Outliers
		Stationary R-squared	Statistics	DF	**p-value**	
Real Gross Domestic Product (Model 1)	3	.984	19.909	18	.338	2

Table 4.6 t-test of Significance

Model		Unstandardized Coefficients		Standardized Coefficients	t	**p-value**	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	11055.916	2320.654		4.764	.000	6328.898	15782.934
	Credit to the private sector	.015	.003	.203	5.015	.000	.009	.021
	Interest Rate	419.777	120.127	.117	3.494	.001	175.086	664.468
	Broad Money Supply: The Official Data Source	2.465	.116	.864	21.159	.000	2.227	2.702

Dependent Variable:

Table 4.7. f Test of Significance

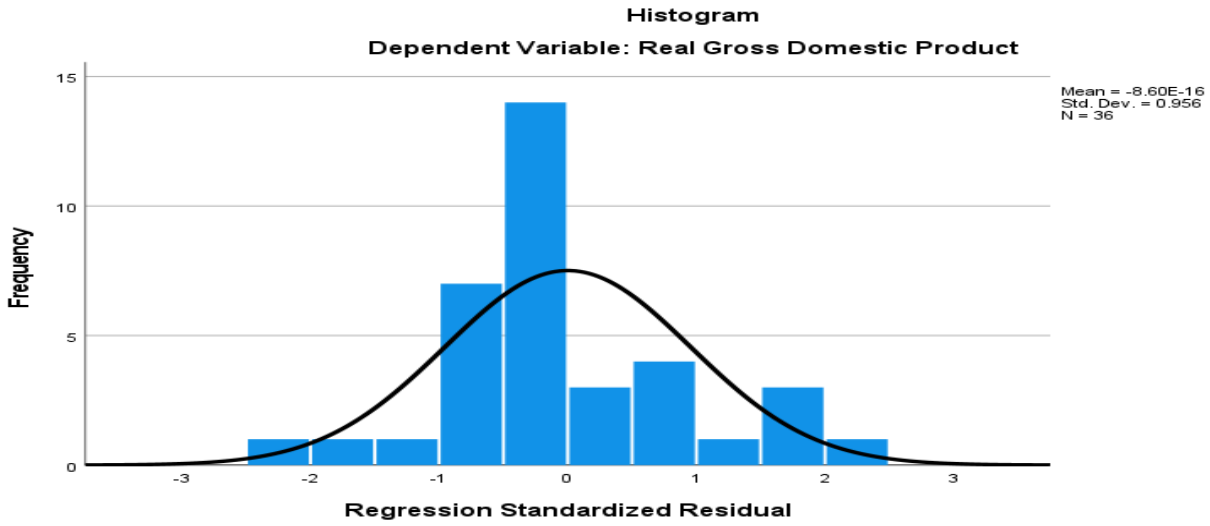
Model		Sum of Squares	df	Mean Square	F	**p-value**
	Regression	11131951534.880	3	3710650511.627	296.842	.000[b]
	Residual	400013273.172	32	12500414.787		
	Total	11531964808.052	35			

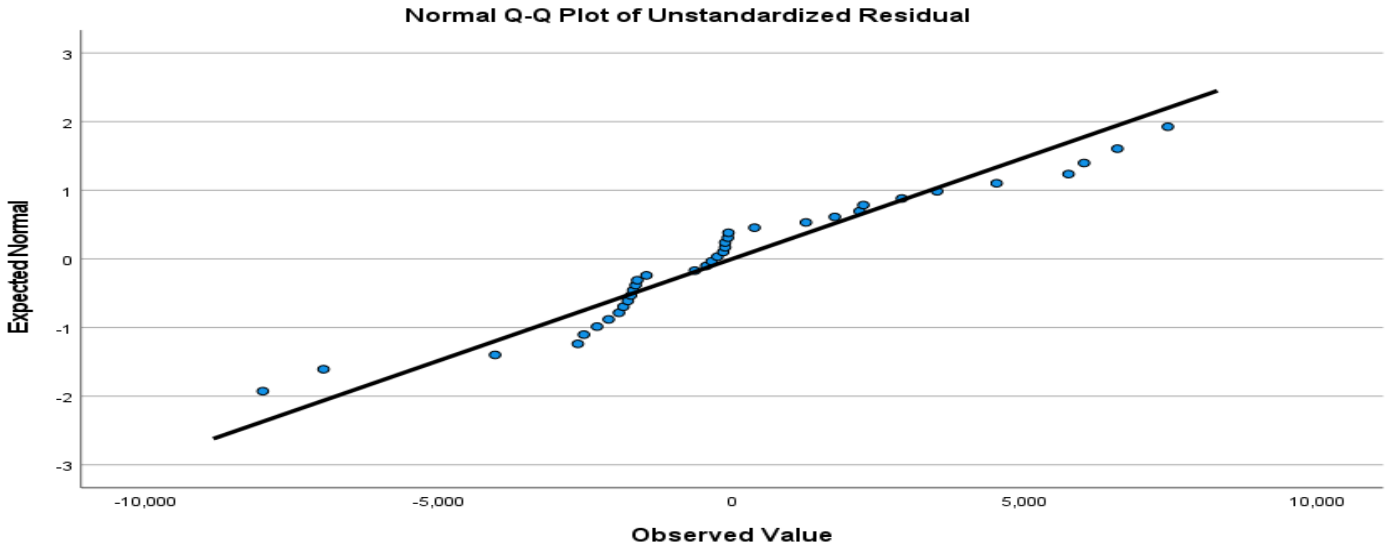
11. Econometric Test of Significance (Second order Test)

a. Second-Order Autocorrelation Test (for RGDP):

- Autocorrelation values:
  - Lag 1: 0.92
  - Lag 2: 0.83
- Both autocorrelations are relatively high, indicating **significant autocorrelation** at both the first and second lags.

b. Jarque-Bera (JB) Test for Normality**:**





JB Statistic: 5.29 The test statistic was significant (p-value = 0.00268), suggesting that the residuals were **not normally distributed**.

c. Granger Causality Test (RGDP and M2):

- **Lag 1**:
  - F-statistic: 16.73, p-value: 0.00027
  - The low p-value indicates that M2 Granger-causes RGDP at lag 1.
- **Lag 2**:
  - F-statistic: 3.89, p-value: 0.0317
  - At lag 2, significant Granger causality persists from M2 to RGDP, but the effect is weaker.

12. Interpretation

The results of the analysis reveal significant insights into the relationship between credit facilities from banks and economic growth in Nigeria between 1988 and 2023. The descriptive statistics in **Table 4.1** provide a general overview, showing the average values of key variables, such as Real Gross Domestic Product (RGDP), credit to the private sector (CBC), interest rates (INT), and broad money supply (M2).

The time series plot in **Figure 4.1** displays the trends in Real Gross Domestic Product (RGDP), credit to the private sector (CBC), interest rate (INT), and broad money supply (M2) from 1988 to 2023. The Orange Line presents RGDP with a clear upward trend over time, indicating that Nigeria's economy has been growing, although not consistently. The sharp spike around 2014 reflects significant growth, possibly tied to favourable economic conditions during that period. However, a notable drop occurs immediately after the peak, suggesting an economic downturn, which could be related to events such as the oil price crash and recession in 2016. The trend stabilised after this drop, but remained volatile. Yellow Line shows the CBC, where credit to the private sector has a much more subdued upward trend than RGDP. There is some slight growth visible, but its magnitude is much smaller than the changes in RGDP, indicating that the level of credit extended to the private sector has not grown as dramatically as the overall economy.

The Pink Line present the Interest rates (INT), which appear quite flat across the period and exhibit minimal fluctuations. This stability suggests that despite changes in RGDP, interest rates did not vary significantly in the dataset. This may indicate a controlled monetary policy environment in which rates do not fluctuate significantly.

Purple Line Broad money supply (M2) exhibits a slight increase but remains low compared to RGDP. This indicates monetary expansion over time, but the magnitude of change in M2 is not as large as that in RGDP. In summary, the plot highlights the relatively greater variability in RGDP compared to other financial indicators, signalling that while the economy has grown over time, other financial indicators like private credit and money supply, have not grown as dramatically. This finding indicates potential areas for policy intervention to better align financial growth with economic expansion.

The chart in figure 4.2 shows a time series comparison between *Observed* and **Fitted** values of Real Gross Domestic Product (RGDP) from 1988 to 2023. The red line represents the actual (observed) values of RGDP over time, and the blue line represents the fitted values generated by a model (time series model). Both lines closely follow each other, especially after 2006, indicating that the model performs a good job of predicting or fitting the observed RGDP values. The fit is particularly strong during periods of steady growth and shows minimal deviation from actual data. The *Periods of Divergence* indicates that there are small periods of divergence between the two lines, particularly in the late 1990s and again around 2021. These divergences could suggest instances in which the model did not fully capture rapid changes in the economy, such as external shocks or other economic factors not accounted for in the model. The Growth Pattern shows that both the observed and fitted RGDP values exhibit a clear upward trend over the entire period, with accelerated growth from the mid-2000s onwards. This trend mirrors the economic growth seen in Nigeria, likely due to factors such as increased oil prices

and structural economic changes during that period. Recent Trends is towards the end of the series, around 2021, the fitted values slightly overestimate the observed values. This suggests that the model predicted more growth than actually occurred, possibly due to unforeseen events like the economic impact of COVID-19 or fluctuations in global oil markets. The model closely tracks Nigeria's economic growth over time, with only minor deviations in certain periods. Overall, the fit suggests that the model is robust and provides a reliable representation of the observed RGDP values, particularly during periods of steady growth. However, slight overestimations at the end may indicate the need for adjustments to account for recent economic disruptions.

The Augmented Dickey-Fuller (ADF) test in table 4.2, 4.3, indicates that most of the variables, including RGDP, CBC, and M2, are non-stationary, meaning they exhibit trends over time. Interest rates, which are close to stationary, are still considered non-stationary at the 5% significance level.

The Johansen Co-integration Test in table 4.4 provides evidence of a long-term equilibrium relationship between RGDP, CBC, INT, and M2. This suggests that, over the long term, these variables move together despite short-term fluctuations. The Error Correction Model (ECM) further supports this finding, showing that broad money supply (M2) has a significant and positive short-term impact on economic growth, with a coefficient of 0.91 and a p-value of 0.003. However, the results also indicate that changes in credit to the private sector and interest rates do not have a statistically significant short-term effect on RGDP.

In table 4.6 4.7 show that the statistical significance of the model is confirmed by the results of the F-test, which demonstrates that the overall model is statistically significant at the 5% level, with an F-value of 296.842 and a p-value less than 0.0001. This indicates that when considered together, the independent variables have a significant impact on the real gross domestic product (RGDP). Additionally, the results of the t-tests show that both credit to the private sector (CBC) and interest rates (INT) are individually significant in explaining variations in RGDP, with p-values below 0.05. This further supports the relevance of these variables in driving economic growth.

Moreover, the Granger Causality Test reveals that broad money supply (M2) has a predictive influence on economic growth, as it Granger-causes RGDP at both lags 1 and 2. This means that changes in M2 can help forecast changes in Nigeria's economic output. In contrast, credit to the private sector and interest rates do not show a significant short-term predictive relationship with RGDP.

In conclusion, these findings suggest that although bank credit and interest rates may not significantly impact economic growth in the short term, the broad money supply plays a crucial role in driving growth. However, the long-term co-integration between all variables highlights the importance of a comprehensive financial approach to supporting Nigeria's economic development. These results underscore the need for policies that enhance broad money supply while ensuring that credit facilities are better aligned with economic growth objectives.

Summary

This study aimed to ascertain the relationship between credit facilities for some banks and the economic growth of Nigeria. The study contains chapter one with an introduction, problem statement, and objective such as to determine the relationship between bank credit and Economic growth, to test the variability between bank credit and economic growth, and to ascertain the impact of money supply on Nigeria's economic growth.

Chapter 2 examines related literature that identified credit as a critical driver of economic growth, enabling businesses and households to expand their activities. The impact of credit on growth is often analysed within frameworks such as the Financial Liberalisation Theory, which suggests that freeing financial markets fosters investment and savings mobilisation, and the Quantity Theory of Credit, which posits that bank-created credit facilitates GDP transactions, thereby driving economic growth. This study seeks to cover the gap on as a result

of the prior studies recognise that bank credit impacts economic growth, the magnitude and direction of this impact vary by country and remain debatable. This study clarifies the specific effects of bank credits on Nigeria's economic growth and provides data-driven insights to guide policymaking.

Chapter 3 presents the methodology aimed at circumventing the research gap. Chapter 4 presents the results from the study, with the objective one being achieved as presented on pages 28 and 27 in table 4.3 and figure 4.1 respectively, objective two achieved and presented on page 27 in table 4.7 while Objective three achieved and presented on page 29 in table 4.4.

This study aimed to assess the impact of financial indicators, including credit to the private sector (CBC), interest rates (INT), and broad money supply (M2), on the Real Gross Domestic Product (RGDP) in Nigeria between 1988 and 2023. Through econometric modelling, including time series analysis, co-integration tests, and an error correction model (ECM), several key findings were obtained:

i. Broad Money Supply (M2) was found to have a significant and positive short-term effect on economic growth, with a strong relationship indicated by the error correction model. Increases in broad money supply contributed positively to economic growth.
ii. Credit to the Private Sector (CBC) and Interest Rates (INT) did not have a statistically significant short-term impact on RGDP. However, long-term equilibrium relationships were observed through the Johansen Cointegration Test, indicating that these variables contribute to economic growth over time.
iii. The Granger Causality Test showed that broad money supply Granger-causes RGDP, meaning that changes in M2 can predict future economic growth.

13. The F-test revealed that the overall model was highly significant, with an F-value of 296.842 and a p-value of less than 0.0001, indicating that the independent variables collectively explain a substantial portion of the variation in RGDP. Additionally, the t-tests confirmed the individual significance of CBC and INT in explaining RGDP at the 5% level.

14. Conclusions

The findings of this study suggest that a broad money supply (M2) is a crucial driver of economic growth in Nigeria in the short term, while the impact of credit on the private sector and interest rates is more pronounced in the long term. The results emphasise the importance of maintaining a stable and adequately managed money supply to support economic growth. Although credit to the private sector and interest rates did not show significant short-term effects, they still play an essential role in the long-term financial development of the country. The significance of these variables highlights the need for comprehensive financial sector reforms that target monetary stability and increased access to private sector credit.

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