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Evaluating the Nexus between Credit Supply and Sectoral Performance in Nigeria

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Abstract

This study investigates the impact of commercial bank credit on the performance of the agricultural, industrial, and commercial sectors of the Nigerian economy from 1991 to 2023. The analysis employed the Fully Modified Ordinary Least Squares (FMOLS) method and standardized regression analysis to evaluate the relationships. The FMOLS results reveal that in the agricultural sector, commercial bank credit exhibited a positive but statistically insignificant effect on sectoral performance, while the Agricultural Credit Guarantee Scheme Fund and agricultural employment had positive and statistically significant impacts. In the industrial sector, commercial bank credit demonstrated positive and significant effects on sectoral performance. Similarly, in the commercial sector, credit supply exerted positive and significant impacts, whereas the interest rate had a negative and significant effect on performance. The standardized regression analysis further highlighted that credit to the industrial sector had the greatest relative impact on Nigeria's economic growth. Based on these findings, the study recommends prioritizing credit allocation to the industrial sector to enhance its contribution to the overall growth and development of the Nigerian economy.

Keywords

credit supply, interest rate, agriculture, industry, standardized regression

1 Introduction

The economy stands to benefit significantly from financial intermediation, as it facilitates the transfer of financial resources from business surplus units to business deficit units, thereby promoting efficient resource allocation. Gerschenkron (1962) argues that in developing economies, banks represent the most effective and efficient source of funding for industrial expansion. In Nigeria, banks dominate as the principal financial intermediaries (Adenugba, 2015), playing a central role in channeling funds across sectors of the economy. Vane and Thompson (1982) highlight that financial intermediaries bridge the gap between lenders and

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borrowers by creating distinct markets for each party, offering securities tailored to their respective needs. However, the potential for financial intermediation to drive economic growth is contingent on the level of development within the financial sector and the saving behaviors of the public. As Adenugba (2015) posits, the availability of investible capital is a critical precondition for economic investments, which are essential for sustained economic growth and development.

The function of banks as intermediaries in promoting technical innovation was already recognized by Schumpeter (1911). He asserted that the best way to accomplish this goal was to identify and support entrepreneurs who had the highest possibility of successfully adopting innovative goods and production methods, which would allow for the effective distribution of savings. Since then, several scholars, including McKinnon (1973), Shaw (1973), Fry (1988), and King and Levine (1993b), have further substantiated the theory regarding the critical role of banks in driving economic expansion. In order to ensure sustained economic progress, banks in emerging nations are required to play extremely important and productive roles in funding their economic initiatives and operations. This assumption stems from the fact that the world's emerging nations are severely short on capital. Theoretical debates over the significance of credit development and the contribution of financial intermediaries to economic growth have long had a prominent place in the literature on developmental finance.

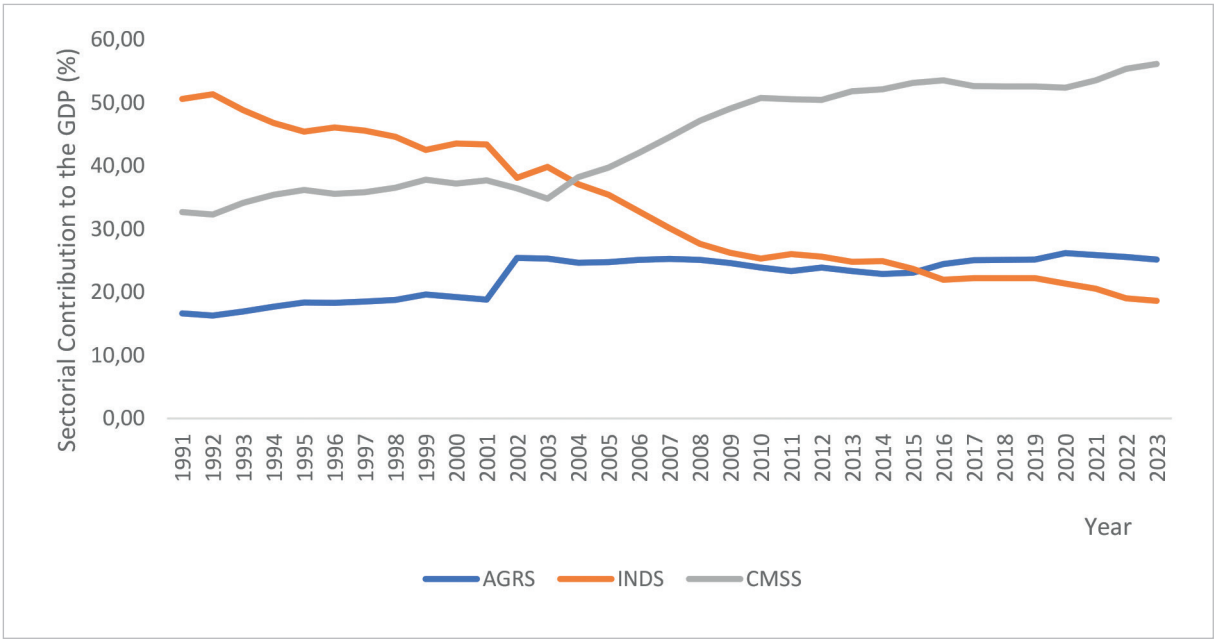
Financial or credit development can foster economic growth by promoting capital accumulation, increasing savings, and enhancing the efficiency of loanable funds (Shaw, 1973). Access to financial services is crucial for both economic growth and poverty alleviation. By securing financing, individuals or firms can enhance their productive capacity through investments in microbusinesses, new tools, equipment, fertilizer, or in sectors like health and education. Such investments can substantially elevate income levels and productivity, thereby driving broader economic development.

Businesses in Nigeria have found it challenging to invest in information technology, up-to-date machinery, and human resource development due to a lack of funding. These investments are essential for lowering production costs, increasing productivity, and enhancing competitiveness. Banks' reluctance to grant manufacturers credit has been widely attributed to low investment, in part because of the mismatch between the medium- to long-term nature of industry funding requirements and the short-term nature of bank finances. Additionally, banks in Nigeria view manufacturing as a high-risk business; as a result, they prefer to lend to low-risk businesses like commerce, which also yield very high profits. Also, fear towards lending to the agricultural sector is attributable to the high risk involved in agribusinesses, as they are rather prone to the vagaries of weather and climate, like floods and droughts, which do not guarantee higher yield.

The argument about banks' intermediation function in economic growth has influenced a lot of literary discourses. However, it appears that most people agree that banks' intermediation function promotes economic development and progress. According to Akinola (2020), banks have historically been involved in manufacturing, financing agriculture, and syndicating loans to economically productive industries. As a result of the banking sector performing these crucial roles effectively, economic growth, as measured by GDP, will increase proportionately. Furthermore, Akpansung and Babalola (2016) noted that the Central Bank of Nigeria has been perceived as playing a leading and catalytic role by employing direct control to manage the expansion of credit generally, as well as to decide the percentage of bank loans and advances that are allocated to "high priority sectors". They contend that the goal of this sectoral bank loan allocation is frequently to boost the nation's productive sectors and, as a result, boost economic growth.

The Nigerian economy has been experiencing declining trends in the performance of key sectors in recent times, as indicated in Figure 1. While the agricultural and industrial sector exhibits a declining trend, the commercial service sector maintains a rising trend.

Figure 1. Trends in the contribution of agricultural (AGRS), industrial (INDS), and commercial service sectors to the GDP of Nigeria. 1991–2023.



Source: Authors' edit

The agricultural sector's contribution to the GDP has exhibited a downward trend, declining from 25.43% in 2002 to 23.89% in 2010. This was followed by a modest recovery to 25.16% in 2019. However, in the wake of the COVID-19 pandemic and its associated macroeconomic repercussions, the sector's GDP share continued to decline, reaching 26.21% in 2020, and further decreasing to 25.58% and 25.18% in 2022 and 2023, respectively. Employment within agriculture has similarly decreased, from 52.36% in 1991 to 49.58% in 2000, and continued to decline to 40.58% in 2010. This downward trend persisted, with the employment share falling to 38.60% in 2021 and 37.99% in 2022.

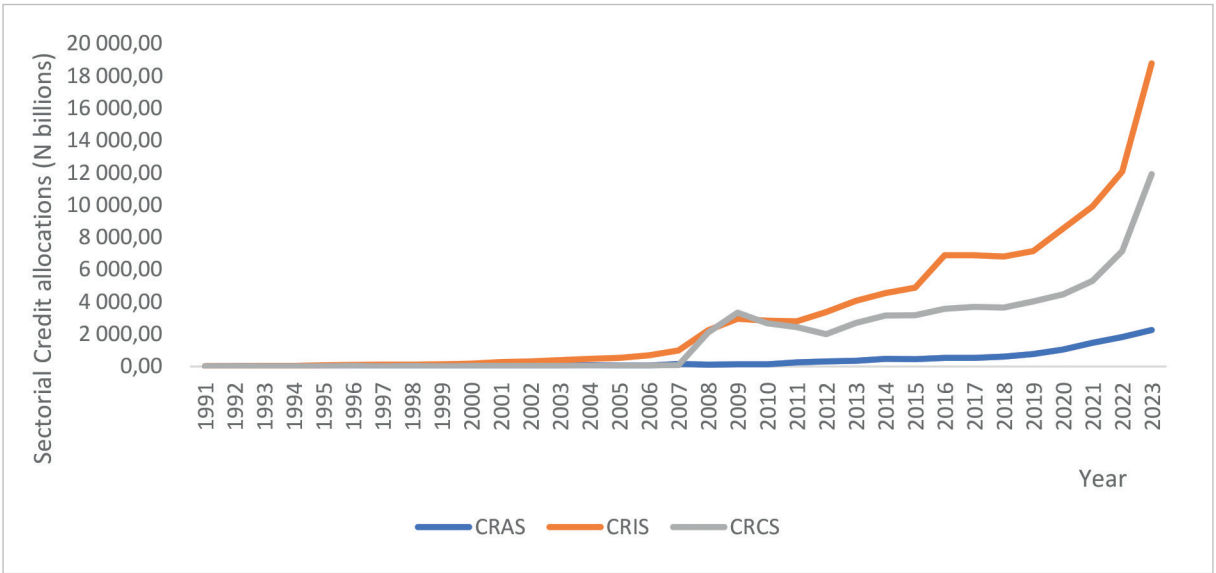
In contrast, the industrial sector's contribution to the GDP has shown a concerning decline, falling from 50.65% in 1991 to 43.56% in 2000, and further to 25.32% in 2010. This decline reached a record low of 21.36% in 2020 and continued to decrease to 18.65% in 2023. Employment within the industrial sector has also experienced a steady decline, from 11.41% in 1991 to 11.23% in 2000. A slight recovery was observed between 2001 and 2004, with industrial employment rising to an average of 11.58%, compared to 11.30% in the 1990s. However, the sector witnessed a significant decline between 2005 and 2011, averaging just 10.67%. Recent statistics, however, indicate a positive shift in industrial employment, which rose from 10.89% in 2012 to 13.77% in 2019 and further to 14.56% in 2022.

The commercial service sector of the Nigerian economy, conversely, has demonstrated a consistent upward trajectory, reflecting sustained growth and performance. The sector's contribution to the GDP increased from 32.68% in 1991 to 37.81% in 1999. Despite a temporary decline to 34.81% in 2003, the sector rebounded sharply, contributing 50.79% to the GDP in 2010, with further increases to 53.18% in 2015 and 56.18% in 2023. Employment in the commercial

service sector has followed a similar positive trend, rising from 36.23% in 1991 to 38.53% in 1999. Between 2000 and 2010, employment in the sector averaged 43.64%, compared to 37.13% in the 1990s. This upward trend continued through to 49.93% in 2013, though it slightly declined to 42.08% in 2018 before recovering to 47.45% in 2022.

These fluctuations in the output contributions of these sectors to the GDP occurred in the period where their respective credit allocations have been on the rise, as indicated in Figure 2.

Figure 2. Sectorial credit allocation to agricultural (CRAS), industrial (CRIS), and commercial service (CRCS) sectors in Nigeria, 1991–2023



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The importance of bank credit to the Nigerian economy has led to a sustained increase in credit to the productive sectors of the Nigerian economy. For instance, commercial banks' credit to the agricultural sector in recent times has been the least compared to other sectors. It increased from ₦5.01 billion in 1991 to ₦31.05 billion in 1999, and averaged ₦20.58 billion in the 1990s. Between 2000 and 2010, commercial banks' credit to the agricultural sector averaged ₦82.23 billion as it increased from ₦41.03 billion in 2000 to ₦128.41 billion in 2010. Recent statistics indicate that credit to the sector has increased to the tune of ₦610.15 billion in 2018, with a further increase to ₦2.26 trillion in 2023.[1] For the industrial sector, Figure 2 portrays that it has the highest credit allocation in recent times, with an increase from ₦2.84 trillion in 2010 to ₦6.82 trillion and ₦18.78 trillion in 2018 and 2023, respectively.

The commercial service sector has experienced a substantial increase in credit allocation, rising from ₦2.69 trillion in 2010 to ₦3.65 trillion in 2018, and reaching ₦11.92 trillion in 2023. This represents significant growth in credit allocation, with increases of 270.49% in the agricultural sector, 175.37% in the industrial sector, and 226.58% in the commercial service sector between 2018 and 2023. Given the predictions of the finance-growth nexus based on the supply-leading hypothesis, the key question arises: can this substantial credit allocations catalyze the desired growth in the agricultural, industrial, and commercial service sectors of the Nigerian economy? Moreover, can they stimulate overall economic growth?

[1] https://www.cbn.gov.ng/documents/Statbulletin.html

There is a growing consensus regarding the strong relationship between business cycles and credit supply expansions (Jordà et al., 2013; Mian et al., 2017a; Baron & Xiong, 2016). The expansion of credit supply generally signals a willingness to lend, which, under typical conditions, is indicative of favorable economic prospects. Justiniano et al. (2015), Bordalo et al. (2016), and Greenwood et al. (2016) contend that credit expansion can be influenced by behavioral factors, such as deregulation, liberalization, or the global savings glut. While it remains difficult to establish a direct causal relationship between credit and economic cycles, the mechanisms through which credit influences business cycles are not fully understood.

Credit expansion has the potential to affect the macroeconomy in two key ways. First, it enables businesses with limited capital to borrow and invest, thus increasing the economy's productive capacity. Second, expanded credit allows households to borrow and spend more, boosting aggregate demand. These two channels differ in their economic impact: the local demand channel increases aggregate demand, while the production capacity channel enhances aggregate supply (Mian et al., 2017b).

The main objective of the paper is to examine the influence of commercial banks' credit on different sectors of the Nigerian economy from 1991 to 2023. The specific objectives are: (i) to examine the effect of commercial banks' credit to agriculture on agricultural sector performance in Nigeria; (ii) to explore the influence of commercial banks' credit to industry on industrial sector performance in Nigeria; (iii) to investigate the impact of commercial banks' credit to commercial services on commercial service sector performance in Nigeria; and (iv) to determine the relative impact of commercial banks' credit to agriculture, industry, and commercial services on economic growth of Nigeria.

This paper is structured in five major sections. The first section is the introduction, followed by the literature review in section two. In section three, the methodology of the research is presented. Section four presents the empirical findings, while the conclusion and recommendations are outlined in section five.

2 Literature review

In the subsequent analysis, we offer a succinct overview of both the theoretical and empirical literature.

2.1 Theoretical literature

In terms of the theoretical literature, we have decided to focus on three approaches, namely, the Theory of Financial Intermediation, the Harrod-Domar Growth Model, and the Loanable Fund Theory.

2.1.1 Theory of Financial Intermediation

Gurley and Shaw (1967) propounded the theory of financial intermediation to address the shortcomings of the direct financing method. It elucidates the significance of the credit allocation intermediation process for the economy at large. The theory's premise is that financial intermediation makes more financial resources available to the economy's productive sector, which raises output and ultimately propels economic growth. As such, effective credit allocation may lead to significant job creation and income, which inevitably raises the degree of economic

growth (Nwite, 2014). Investible financial resources are therefore the most important component in every economy's growth process (John & Lawal, 2019). This theory is relevant to the research because DMBs are essential components of economic systems since they play a significant role in financing and facilitating the flow of credit.

On the basis of this, the theory proposes three significant functions of credit in economic expansion (Levine, 1999; Wachtel, 2003). First, it makes it easier to scrutinize loan applicants and keep an eye on fund recipients. This makes resource allocation better. Second, by offering alluring tools and saving vehicles, it promotes the mobilization of funds. Finally, it offers chances for liquidity and risk control. As a result, these encourage the growth of credit markets as well as the usage of credit instruments that have appealing features that allow for risk sharing. Furthermore, Greenwood and Jovanovic (1990) claimed that effective bank development and credit distribution play a significant role in the expansion of the economy by acting as a middleman between investors and savers. This suggests that the banking industry is a crucial component of economic systems. As a result, the growth of the financial system affects a country's economic progress (Agu, 1988).

2.1.2 Harrod-Domar Growth Model

Harrod (1939) and Domar (1946) propounded the Harod-Domar growth model to explain economic growth in terms of capital formation and savings levels. It was predicated on the idea that the money supply's influence on an economy is contingent upon its capacity to affect loan interest rates, or the loan-to-deposit ratio. Interest rates have an impact on investment levels, which in turn have an impact on national income. According to the model, changes in capital stock or investment have a linear relationship with changes in national income. It is assumed that savings determine investment. Therefore, because savings have a positive effect on capital formation, they are theoretically thought to have a beneficial effect on economic growth. The model's consequence is that the focus on saving precludes the conclusion that the allocation function of deposit money bank credit affects economic growth.

The McKinnon-Shaw hypothesis supported the idea that credit allocation affects economic growth. By contrasting restricted and liberalized financial systems, it is possible to verify the significant contribution banks provide to growth (John & Lawal, 2019). The Harrod-Domar Model posits that the financing for investment operations is derived from the deposits of consumers (Akujuobi and Chima, 2012). According to this concept, economic development will thus occur at the rate at which society is able to mobilize savings in conjunction with investment productivity (Levine, 1997; Azege, 2004). As a result, it is quite likely that credit will need to be allocated for investment in an economy that wants to develop.

2.1.3 Loanable Fund Theory

In accordance with the loanable funds theory, the rate of interest is the price of credit that is established by the demand and supply of loanable funds (Jhingan, 2011). The government, businessmen, and consumers require loanable funds for investment, hoarding, and consumption purposes. The government borrows money for the construction of public works or for war preparations; businessmen borrow for the purchase of capital goods and for starting investment projects; these borrowings are interest elastic and rely primarily on the expected rate of profit in comparison to the rate of interest (John & Terhemba, 2016); consumers' demand for loanable funds is for the purchase of durable and non-durable consumer goods; and individual borrowings are also interest elastic.

At lower interest rates, people are more likely to borrow money than at higher rates. According to this theory, when it comes to investment funds, the demand curve slopes downward, indicating that more money is borrowed at lower interest rates and less at higher rates. Commercial bank credits and real sector output are linked by the theory of loanable funds, which supports the idea that borrowing for real sector investment is interest rate elastic because it is based on the current interest rate.

2.2 Empirical Literature

Studies have been conducted to investigate how commercial banks' credit influences the real sectors of the economy, as well as its impact on aggregate economic growth. The study by Fapetu & Obalade (2015) was geared towards ascertaining the impact of sectoral credit allocations on the growth of the Nigerian economy across different regimes. The analytical technique of the study was based on the ordinary least squares approach. Under the intensive regulation regime (1960–1985) and deregulation regime (1986–1995), all the sectoral credit allocation (agriculture, industry, commerce, and others) were observed to exert an insignificant effect on economic growth. On the contrary, the guided deregulation regime (1996–2012) was matched with a positive and significant effect of credit (credit to the production sector – agriculture and industry) on economic growth. The study therefore recommended the use of guided regulation by the monetary authority against total deregulation.

John and Terhemba (2016) used the Cochrane-Orcutt technique to study how commercial bank credit affected Nigeria's manufacturing sector between 1980 and 2015. The analysis employed five variables: the output of the manufacturing sector, the rate of inflation, interest rates, loans/advances, and the broad money in circulation. The study discovered that while loans/advances, and the overall money supply had a beneficial impact on Nigeria's manufacturing sector, inflation and interest rates have a negative impact. Therefore, the research suggested creating and implementing policies that, on the one hand, would lower interest rates and inflation, and, on the other hand, would increase loans, advances, and the overall money supply in order to boost the sector's output. The model employed in the study failed to recognize labor and exchange rate as critical variables that could affect the performance of the manufacturing sector of the Nigerian economy.

Bada (2016) examined the effects of bank loans on Nigerian industry and agricultural outputs over a thirty-one-year span (1984–2014). The data was analyzed using the VAR model, the Vector Error Correction test, and the Causality test. The outputs of the industry and agriculture sectors were significantly impacted by bank loans. The study failed to adequately explore the impulse response function and variance decomposition and only relied on the VAR estimates which do not give adequate information on the forecasting power of the model. Using a two-stage least square and Granger causality test, Akpansung and Babalola (2016) investigated the relationship between bank credit and the growth of the Nigerian economy from 1970 to 2008. The findings showed that bank credit had a negative effect on the country's economic growth, with a causal relationship between the GDP and bank credit.

Similarly, Sogules and Nkoro (2016) used time series data from 1970 to 2013 to examine how bank credits on manufacturing and agricultural sectors affected Nigeria's economic growth. The study was conducted using the Error Correction Model (ECM) and the Co-integration test. They discovered that bank credit to the agricultural sector had a negative and negligible effect on economic growth, but that bank credit to the industrial sector had a negative and significant effect on economic growth.

In order to ascertain how bank loans affected the expansion of the Nigerian economy, Nwanyanwu (2018) used OLS econometrics approaches. According to the study, bank credit has a major and favorable influence on the expansion of the Nigerian economy. Amoo et al. (2017) used fully modified least squares to empirically assess the local characteristics and policy environment that affect the Nigerian economy's ability to absorb credit during the first quarter of 1993 to the fourth quarter of 2013. Results indicated that credit promotes growth even in the presence of low levels of trade openness, monetary policy, investment climate, and infrastructure. Additionally, when local or domestic conditions were favorable, private sector credit boosted economic growth, according to the composite local condition index analysis. In 2013, the domestic economy's potential to absorb credit was assessed to be 29% of the GDP. These findings imply that Nigeria has an opportunity to expand lending in a way that would boost the economy.

Olowofeso et al. (2017) used time series data from the first quarter of 1992 to the fourth quarter of 2015 to examine the link between agricultural output and credit to the agricultural sector in Nigeria using a nonlinear autoregressive distributed lag (NARDL) model. The findings indicated that there is no asymmetry in the short-term effects of credit on agricultural production growth (both positive and negative changes); nevertheless, there are distinct equilibrium relationships over the long term. The dynamic adjustments demonstrated that, with a four-quarter lag of the prediction horizon, the influence of the favorable changes in credit to agriculture is mostly responsible for the cumulative gain in agricultural production. The use of a bivariate analysis in the study is weak and blurs the potency of other critical variables, such as interest rate and labor employment, that could affect the agricultural sector of the Nigerian economy.

Using the ARDL model, Kalu et al. (2017) investigated the effects of bank lending on Nigeria's industrial sector between 1986 and 2013. They found that whereas interest rates have a negative and significant link with the output of the manufacturing sector, bank lending has a long-term positive and significant effect on manufacturing output. Andabai and Eze (2018) examined the relationship between bank lending and the expansion of Nigeria's manufacturing sector from 1990 to 2016. The results of the causality test showed that bank credit had no causal link with the expansion of the Nigerian manufacturing sector, while the Vector Error Correction Model showed that bank credit had no short-run equilibrium significant association with the growth of the Nigerian manufacturing sector.

In order to investigate the link between banks' private sector credits and economic growth in Nigeria over the period 1974–2010, Odhiambo (2008) used the Autoregressive Distributed Lag (ARDL) Bound Approach and Granger Causality test. The analysis found a strong connection between economic growth and private sector loans over the long term. However, the Granger causality test portrayed no causal relationship between credit and economic growth during the study period. The study came to the conclusion that Nigerian banks fit into the Schumpeterian independent hypothesis stage rather than performing either a supply-leading or demand-following function.

Kolapo et al. (2018) examined the relationship between Nigeria's economic progress from 1970 to 2016 and the credit provided by deposit money banks to the public and commercial sectors. The Ng-Perron and Augmented Dickey Fuller Breakpoint Unit Root Tests were used in this investigation. The outcome demonstrated that lending interest rates and bank credits to government agencies remained stable. In a similar vein, the feedback theory proves that banks' loans and economic growth are mutually dependent.

The study by Chukwunweike (2018) explored how bank credit could affect growth in agriculture, manufacturing, commerce, and the overall economy. The study utilized data spanning from 1981 to 2015, which were analyzed using the ordinary least squares approach.

The study observed a positive and significant effect of bank credit on each of the sectors of the economy. However, the volume of bank credit exerted a positive but insignificant effect on the overall growth of the Nigerian economy. Consequently, the government was advised to develop policies that would not only boost the economy's overall growth but also guarantee balanced growth by ensuring that each sector of the economy makes its fair share of contributions. This study established that the variables in the model were all stationary at first difference, but ended up using the OLS technique of estimation; hence, the methodology of the research is weak and cannot provide reliable estimates.

Orimogunje (2019) examined how bank credit affected Nigeria's inflation and economic growth between 1996 and 2014. The econometric method used was the Granger Causality test. According to the Granger causality test results, there is no significant causal relationship between domestic and net domestic credit and inflation, although there is a statistically significant association between them and gross domestic product.

From 1986 to 2015, John and Lawal (2019) took a view on how Nigeria's economic growth was affected by the sectoral distribution of bank lending. The vector error correction model (VECM), the Johansen co-integration test, and the fully modified Ordinary Least Square (FMOLS) regression were used to analyze the data. The results of this study show that the explanatory factors and economic growth have a long-term link. According to the regression's findings, credit allocated to the productive sector and the broad money supply significantly boost Nigeria's economic growth, whereas credit allocated to the service sector, general commerce, and other sectors significantly hinders growth. The study modelled growth as a function of only commercial bank loans/advances to the production sector, general commerce, service, and others. However, it fails to incorporate key variables like labor, exchange rate, and government spending in the growth model.

King and Levine (1993a) study examined how bank lending affects Nigeria's industrial production growth. Cointegration and vector error correction model (VECM) methods were used to assess time series data spanning 36 years. According to the result, bank lending rates and the manufacturing capacity utilization have a significant impact on Nigerian manufacturing production. They recommended that, in order to promote investment, lending, and borrowing by financial institutions, a coordinated effort by the government, manufacturers, and lending institutions is required to examine the lending and growth policies and offer a suitable macroeconomic environment.

The effect of bank credit on the expansion of Nigeria's industrial sector from 2004 to 2018 was examined by Akinola et al. (2020). The FMOLS approach was employed to assess the distinct effects of bank financing determinants on the expansion of the industrial sector, as shown by manufacturing sector output. The study demonstrated that the expansion of the industrial sector is significantly impacted by bank credits, the domestic money supply, and the maximum bank lending rate.

The impact of bank lending and economic expansion on Nigeria's industrial production was examined by Anyanwaokoro (1999). The study employed the co-integration and vector error correction model (VECM) methodologies for the model's analysis, using time series data spanning 36 years (1973–2009). The study's empirical findings demonstrated that bank lending and manufacturing capacity utilization have a major impact on Nigerian manufacturing output. Also, a strong effect of manufacturing production on economic growth was discovered, leading to the nation's prosperity and advancement.

Ogunlokun and Liasu (2021) used the ARDL approach to evaluate the link between bank financial intermediation and the performance of Nigeria's agriculture sector using an annual

dataset spanning 1992 to 2017. The findings also showed a weak but favorable correlation between the performance of the agricultural sector and the loans given to it by commercial banks. The ECM's findings showed that although most aspects of bank financial intermediation were beneficial in the long run, they had little effect on raising the agriculture sector's performance in Nigeria.

Effiong and Ekong (2022) looked at how bank loans affected the Nigerian economy's industrial sector performance between 1981 and 2018. The analysis employed the ARDL Bounds test to check for the presence of a long-term association. The Bounds test result showed that there was a long-term correlation between the model's explanatory variables and the performance of the industrial sector. According to the findings of the ARDL short-run dynamics and long-run form, bank credit significantly and positively impacted the performance of the industrial sector over the long term. Additionally, it was seen that the interest rate had a negative, albeit negligible, effect on the performance of the industrial sector.

Ogbonnaya et al. (2022) investigated the effects of agricultural sector finance on the agricultural industry's performance in Nigeria between 1981 and 2021. The Vector Auto-regression estimation technique was used to estimate various regression analyses in this *ex post facto* investigation. According to the study, Nigeria's agricultural production performance improved by 0.07% and 0.04% for every 1% rise in the agricultural credit guarantee program fund and commercial bank lending to agriculture, respectively. The findings showed that Nigeria's agricultural production performance was enhanced by funding for agricultural lending.

Yerima and Idris (2023) looked at how bank loans affected Nigeria's economic expansion. Time series data from 1986 to 2022 were used in the study. The Vector Error Correction Model (VECM) and the Johansen cointegration approach were used to analyze the data and determine the short- and long-term relationships between the variables under consideration. Additionally, the direction of causation between bank credit and economic growth was assessed using Granger causality. According to the analysis' findings, economic growth was positively and significantly impacted by private sector, public sector, and combination sector credits. The study failed to incorporate important variables in the growth model and only incorporated credit variables. Further, the study incorporated credit to the private sector, credit to the public sector, and total credit (credit to the private sector and credit to the public sector) in the same model; hence, there is a high possibility of multicollinearity in the model.

2.3 A summary of the reviewed literature and identification of the research gap

Empirical studies have revealed diverse patterns regarding the relationship between credit and the real sector of the economy. Initially, many studies focused on the credit-growth nexus, which generally exhibited a positive correlation, yet often overlooked the sectoral impact of each credit component. This study seeks to address this gap in the scholarly literature. Furthermore, studies examining the credit-growth nexus typically failed to investigate the relative impacts of sectoral credit allocations on overall economic growth. In response, we aim to fill this gap by employing a standardized regression model to assess the relative impact of sectoral credit allocations on the growth of the Nigerian economy. The findings of this study hold significant implications for policy simulations that could inform credit allocation strategies within the financial system.

3 Methodology

3.1 Model Specification

In specifying the models for the study, inspiration was drawn from the work of Chukwunweike (2018), who adopted a multi-sectoral approach to model the link between bank credit and different sectors of the economy. The original model is specified as follows:

$$Y_t = f(VBC_t, CPS_i, IR_t) \quad (1)$$

Where is a vector of dependent variables, which were the manufacturing sector contribution to the GDP, the agricultural sector contribution to the GDP, and the commercial sector contribution to the GDP. The three explanatory variables were volume of bank credit (VBC), credit to the private sector (CPS), and interest rate (IR).

The model presented in Equation (1) was modified to capture unique features pertaining to some sectors as well as other key variables that could affect their performances. Consequently, the model for this study is expressed as follows for the first three objectives.

$$AGRS_t = f(ACGSF_t, CRAS_t, PRLR_t, EMPA_t, GEXE_t, EXCR_t) \quad (2)$$
$$INDS_t = f(CRIS_t, PRLR_t, EMPI_t, GEXE_t, EXCR_t) \quad (3)$$
$$CMSS_t = f(CRCS_t, PRLR_t, EMPC_t, GEXE_t, EXCR_t) \quad (4)$$

The variables in the above models are explained as follows:

AGRS = agricultural sector output (% of GDP)
INDS = industrial sector output (% of GDP)
CMSS = commercial sector output (% of the GDP)
ACGSF = Agricultural Credit Guarantee Scheme Fund (ACGSF) Operations – Value of Loans Guaranteed (₦' millions)
CRAS = commercial bank credit to the agricultural sector (in ₦ billions)
CRIS = commercial bank credit to the industrial sector (in ₦ billions)
CRCS = commercial bank credit to the commercial sector (in ₦ billions)
PRLR = prime lending rate
EMPA = employment in the agricultural sector (% of total employment)
EMPI = employment in the industrial sector (% of total employment)
EMPC = employment in the commercial service sector (% of total employment)
GEXE = Government expenditure on economic services
EXCR = average monthly official exchange rate.

Equations (2) through (4) are further expanded in their econometric forms and are presented as follows:

$$AGRS_t = \alpha_0 + \alpha_1 ACGSF_t + \alpha_2 CRAS_t + \alpha_3 PRLR_t + \alpha_4 EMPA_t + \alpha_5 GEXE_t + \alpha_6 EXCR_t + \mu_{1t} \quad (2)'$$
$$INDS_t = \beta_0 + \beta_1 CRIS_t + \beta_2 PRLR_t + \beta_3 EMPI_t + \beta_4 GEXE_t + \beta_5 EXCR_t + \mu_{2t} \quad (3)'$$
$$CMSS_t = \gamma_0 + \gamma_1 CRCS_t + \gamma_2 PRLR_t + \gamma_3 EMPC_t + \gamma_4 GEXE_t + \gamma_5 EXCR_t + \mu_{3t} \quad (4)'$$

Where the $\alpha's$ are the parameters to be estimated for Equation (2)', $\beta's$ are the parameters to be estimated for Equation (3)', $\gamma's$ are the parameters to be estimated for Equation (4)', and the $\mu's$ are the respective error terms for the three models.

It is expected that the constant terms (α_0, β_0, *and* γ_0) (should be non-zero since the models are not treated as regression through the origin. For Equation (2)', it is expected that α_1, α_2, α_4, *and* α_5, should be positive. This is because credits are treated as capital and should be able to drive growth in the agricultural sector; employment in the agricultural sector should have a positive effect on the agricultural sector since labor is a critical input in agricultural production function; and government expenditure on economic services should drive growth within the agricultural sector as it could aid in the provision of basic economic overheads. On the contrary, is expected to be negative since a higher interest rate will discourage borrowing to finance agricultural activities; is expected to be negative since a higher exchange rate can cause a higher cost of importing critical agricultural inputs, which can therefore stifle growth within the sector.

In Equation (3)', it is expected that β_1, β_3, *and* β_4, should be positive. Increased credit to the industrial sector should boost industrial production, which can spur growth within the sector; increased employment in the industrial sector should boost output within the sector, so long as there is no diminishing marginal productivity of labor; and government spending on economic services should drive growth within the industrial sector since it is a form of injection into the economy. On the contrary, β_2, is expected to be negative since a higher interest rate increases the cost of borrowing to finance industrial activities; and β_5, is also expected to be negative since the Nigerian economy depends heavily on importation of key raw materials for industrial production.

For Equation (4)', it is expected that γ_1 should be positive since increased credit to commercial activities will boost production within the sector; γ_2 is expected to be negative since higher interest rate will discourage borrowing to finance commercial activities; γ_3 is expected to be positive since increased employment within the commercial service sector will boost output so long that there is no diminishing marginal productivity of labour within the sector; γ_4 is expected to be positive since government spending on economic services can help boost commercial services within the economy; and γ_5 is expected to be negative since exchange rate depreciation can stifle commercial activities within an economy.

To examine the relative impact of the various sectoral credit and loan advances on the aggregate economy (which is the fourth objective), the standardized regression model for the study is specified as follows:

$$RGDP_t^* = f\,(CRAS_t^*,\ CRCS_t^*) \qquad (5)$$

Where is the standardized real gross domestic product at time t, is the standardized commercial bank credit to the agricultural sector, is the standardized commercial bank credit to the industrial sector, and standardized commercial bank credit to the commercial service sector.

Equation (5) is further explicitly written in its econometric form by incorporating the parameters and the error term as follows:

$$RGDP_t^* = \beta_1^* CRAS_t^* + \beta_2^* CRCS_t^* + \beta_3^* CRCS_t^* + \mu_{4t}^* \qquad (5)'$$

Where β_1^* captures the relative impact of CRAS on RGDP, β_2^* captures the relative impact of CRIS on RGDP, β_3^* captures the relative impact of CRCS on RGDP, and μ is the error term which is assumed to be white noise. The regression coefficients of the standardized variables, denoted

by β_1^*, β_2^* and β_3^*, are known in the literature as the beta coefficients (Gujarati, 2003). Note that the standardized regression model is a regression-through-the-origin; hence, the constant term is absent.

3.2 Nature and sources of the data

The data for this study are generally time series in nature and were obtained for the period 1991 to 2023. The choice of the period of analysis was mostly dependent on data availability on key variables in the model. The period captures a total of thirty-three (33) years, which makes it a large sample size; hence, reliable estimates can be derived through analysis. The data were obtained from two secondary sources, namely: the World Bank and the Central Bank of Nigeria. Data on employment in agriculture, employment in industry, and employment in commercial services were obtained from the World Bank publication on world development indicators,[2] while data on the rest of the variables were obtained from the Central Bank of Nigeria statistical bulletin.[3]

3.3 Analytical technique employed

3.3.1 Unit Root Test

With the nature of the data, which is a time series in this study, the conduct of a diagnostic test by examining the unit root properties of the variables is crucial. The unit root test is conducted to establish the order of integration (or stationarity) of a given time series variable. In testing for the stationarity of the series, the Augmented Dickey-Fuller (ADF) developed by Dickey and Fuller (1979) is applied. The test is conducted under the constant and trend assumption on the level and first difference. The determination of the order of integration is of utmost importance as it directs the researcher on the appropriate technique of analysis to be utilized. This is because regressing a non-stationary time series variable on another non-stationary time series variable will produce a spurious result. Given a time series variable Y, the general form for the test equation is presented below:

$$\Delta Y_t = \alpha_0 + \delta t + \alpha_1 Y_{t-1} + \sum_{i=1}^{m} \alpha_2 \Delta Y_{t-i} + \varepsilon_t \quad (6)$$

Where Y_t is a time series, t is a linear time trend, Δ is the first difference operator, β_0 is a constant, i is the optimum number of lags in the independent variables, and is the random error term. Equation (6) follows the constant with a linear deterministic time trend assumption. The null hypothesis for the test is that Y_t contains a unit root and is specified as follows:

$$H_0: \alpha_1 = 1$$

Against the alternative hypothesis, that there is no unit root, expressed as:

$$H_1: \alpha_1 < 0$$

[2] https://databank.worldbank.org/source/world-development-indicators

[3] https://www.cbn.gov.ng/documents/Statbulletin.html

If the estimated α_1 is significantly less than 0 as measured by a τ-statistic (read as tau statistic), then we can reject the null hypothesis of a unit root; this implies that the variable is stationary. If the estimated is not significantly less than 0, then we cannot reject the null hypothesis of a unit root; this implies that the variable is nonstationary.

3.3.2 Fully Modified Ordinary Least Squares (FMOLS) Regression Analysis

The fully modified ordinary least squares (FMOLS) method was developed by Stock and Watson (1993) to estimate parameters in a model with a higher order of integration. Thus, this technique of estimation is suitable when we have a series in the model being stationary at the second difference. Therefore, FMOLS is a simple and efficient approach to estimating the coefficients of a cointegrating relationship in this case. The FMOLS overcomes the problem of serial correlation and endogeneity of variables, so it is superior to other regression models, which are used to estimate the elasticities of regression coefficients. The technique is rooted on Monte Carlo simulations and is superior in small samples as well as being capable of accommodating higher orders of integration and accounting for possible simultaneity within regressors in the model (Masih & Masih, 1996).

3.3.3 Standardized Regression Model

If we deduct the variable's mean value from each of its individual values and divide the result by the variable's standard deviation, we say that the variable is standardized (Gujarati, 2003). Thus, in the regression model specified in Equation we redefine these variables as:

$$RGDP^* = \frac{RGDP_i - \overline{RGDP}}{S_{RGDP}}$$

$$CRAS^* = \frac{CRAS - \overline{CRAS}}{S_{CRAS}}$$

$$CRIS^* = \frac{CRIS - \overline{CRIS}}{S_{CRIS}}$$

And

$$CRCS^* = \frac{CRCS - \overline{CRCS}}{S_{CRCS}}$$

Where:

$\overline{RGDP}$ = sample mean of *RGDP*

S_{RGDP} = sample standard deviation of *RGDP*

$\overline{CRAS}$ = sample mean of *CRAS*

S_{CRAS} = the sample standard deviation of *CRAS*

$\overline{CRIS}$ = sample mean of *CRIS*

S_{CRIS} = sample standard deviation of *CRIS*

$\overline{CRCS}$ = sample mean of *CRCS*

S_{CRCS} = sample standard deviation of *CRCS*

The variables *RGDP**, *CRAS**, *CRIS** and *CRCS** are called *standardized variables*. An interesting property of a standardized variable is that its mean value is always zero and its standard deviation is always 1 (Gujarati, 2003).

By standardizing each regressor, we place them on an equal footing and enable direct comparison. A standardized regressor contributes more proportionately to the explanation of the regressand than another standardized regressor in that model if its coefficient is greater than the latter's. Stated differently, we may use the beta coefficients to gauge how strong one regressor is in relation to the others.

4 Empirical findings

4.1 Unit Root Test

To determine the order of integration of the time series variables utilized in the study, the Augmented Dickey-Fuller (ADF) unit root test is conducted. The result is presented in Table 1 and was based on the constant and deterministic trend assumption.

Table 1. Unit Root Test Result

Variables	ADF tatistic	5% Critical Value	Probability	Order of Integration
AGRS	–5.8445	–3.5629	0.0002	I(1)
CRAS	–6.3001	–3.5629	0.0001	I(1)
ACGSF	–5.2607	–3.5629	0.0009	I(1)
EMPA	–6.1300	–3.6220	0.0003	I(2)
INDS	–6.6912	–3.5629	0.0000	I(1)
CRIS	–4.6299	–3.5629	0.0044	I(1)
EMPI	–4.2454	–3.5684	0.0113	I(2)
CMSS	–3.9367	–3.5629	0.0223	I(1)
CRCS	–5.5801	–3.5629	0.0004	I(1)
EMPC	–4.4212	–3.5742	0.0077	I(1)
PRLR	–5.2459	–3.5578	0.0009	I(1)
GEXE	–6.8099	–3.5629	0.0000	I(1)
EXCR	–4.3517	–3.5742	0.0091	I(2)

Source: Authors' edit

The unit root test result in Table 1 portrayed that the series used for the study exhibited a higher order of integration. While the majority of the series were stationary at first difference (being I(1) variables), the rest were stationary at second difference (being I(2) variables). This higher order of integration recorded in the analysis, therefore, warrants the use of the cointegrating regression analysis based on the fully modified ordinary least squares (FMOLS) as the appropriate technique of analysis for this study.

4.2 Cointegration Test

The cointegration analysis is based on the Hansen Parameter Instability test, and the result is presented in Table 2. The null hypothesis is that "Series are cointegrated".

Table 2. Hansen Parameter Instability Cointegration Test Result

Model	Lc statistic	Stochastic Trends (m)	Deterministic Trends (k)	Excluded Trends (p2)	Probability
I	1.2707	6	0	0	> 0.20
II	1.6050	5	0	0	> 0.20
III	0.3406	5	0	0	> 0.20

Source: Authors' edit

The cointegration result presented in Table 2 portrays the insignificance of the Lc statistics at the 5% level. Hence, the null hypothesis is accepted, and we conclude that there is a cointegrating relationship in the three models.

4.3 Fully Modified Ordinary Least Squares (FMOLS) Regression Analysis

To examine the influence of commercial banks' credit on the agricultural sector and agricultural sector performance in Nigeria, the result of the FMOLS is presented in Table 3.

Table 3. The Fully Modified Ordinary Least Squares (FMOLS) Regression Result for Model I

Dependent Variable: AGRS Method: FMOLS				
Variable	Coefficient	Std. Error	t-Statistic	Probability
ACGSF	3.8339	0.5222	7.3422	0.0007
CRAS	0.7497	0.9675	0.7750	0.4734
PRLR	0.0998	0.1456	0.6858	0.5233
EMPA	1.2138	0.2734	4.4403	0.0068
GEXE	–1.4303	0.4708	–3.0378	0.0288
EXCR	0.0422	0.0051	8.3124	0.0004
C	–62.0385	20.3006	–3.0560	0.0282
R-squared	0.9900	Mean dependent var		22.8244
Adjusted R-squared	0.9418	S.D. dependent var		3.0202
S.E. of regression	0.7287	Sum squared resid		2.6553
Long-run variance	0.1289			

Source: Authors' edit

Consistent with the result presented in Table 3, both the agricultural credit guarantee scheme fund (ACGSF) and commercial bank credit to the agricultural sector (CRAS) exerted a positive effect on the contribution of the agricultural sector to the GDP, though only the ACGSF posed a significant effect. The insignificant effect of commercial banks' credit to the agricultural sector can be attributed to the untimely release of loans with the associated bottlenecks, which does not allow for the timely release of such credit to farmers. This implies, therefore, that increased ACGSF will boost the agricultural sector performance. From the obtained estimate,

a 1% increase in the ACGSF will prompt the agricultural sector's contribution to the GDP to increase by 3.8339% on average. These findings align with the empirical works of Bada (2016), Olowofeso et al. (2017), Chukwunweike (2018), Ogunlokun and Liasu (2021), and Ogbonnaya et al. (2022). Also, the interest rate was observed to exert a positive but insignificant effect on the agricultural sector's contribution to the GDP during the period of analysis.

The employment in the agricultural sector was observed to have a positive and significant effect on the agricultural sector's contribution to the GDP. This implies that increased employment within the sector will cause an increase in output, which will further boost the GDP of the Nigerian economy. The estimated coefficient signifies that a 1% increase in employment in the agricultural sector will lead to a 1.2138% increase in the agricultural sector's contribution to the GDP. This is an indication that there is no diminishing marginal productivity of labor within the agricultural sector. However, government expenditure on economic services exerted a negative and significant effect on agricultural sector performance during the study period. This implies that government spending on economic services has not been able to offer the desired effects within the agricultural sector. The coefficient, therefore, portrays that a 1% increase in government expenditure on economic services will lead to a 1.4303% decrease in agricultural sector contribution to the GDP.

The exchange rate was observed to exert a positive and significant effect on agricultural sector performance during the study period, though this is not in line with *a priori* expectations. A possible reason for this could be that exchange rate appreciation could increase the cost of food importation, thereby creating incentives for boosting domestic food production. The estimated coefficient indicates that a 1% increase in the exchange rate will lead to a 0.0422% increase in the agricultural sector's contribution to the GDP.

The constant term of the model, which is statistically significant, implies that the agricultural sector's contribution to the GDP will be -62.04% on average. The R-squared coefficient of 0.9900 implies that the explanatory variables in the model accounted for 99% of the total variations in the performance of the agricultural sector of the Nigerian economy. This is a good fit, and it remains so even being adjusted for degree of freedom as they account for 94.18% of the total variations in the performance of the agricultural sector.

To investigate the influence of commercial banks' credit on the industrial sector and the industrial sector's contribution to the GDP, Table 4 presents the regression result.

Table 4. Fully Modified Ordinary Least Squares (FMOLS) Regression Result for Model II

Dependent Variable: INDS Method: FMOLS				
Variable	Coefficient	Std. Error	t-Statistic	Probability
CRIS	6.7396	0.2397	28.1191	0.0000
EMPI	1.2729	0.3839	3.3153	0.0090
PRLR	0.3233	0.0869	3.7194	0.0048
EXCR	–0.0134	0.0050	–2.6513	0.0264
GEXE	3.0395	0.3681	8.2568	0.0000
C	41.4458	4.8609	8.5264	0.0000
R-squared	0.9988	Mean dependent var		32.4861
Adjusted R-squared	0.9960	S.D. dependent var		9.9687
S.E. of regression	0.6297	Sum squared resid		3.5684
Long-run variance	0.1247			

Source: Authors' edit

The result presented in Table 4 indicated that commercial banks' credit to the industrial sector exerted a positive and significant effect on the industrial sector contribution to the GDP at the 1% level of significance. Thus, increased credit to the sector will increase the sector's productivity, which therefore boosts the overall productivity of the economy. The estimated coefficient implies that a 1% increase in commercial banks' credit to the industrial sector will increase the industrial sector's contribution to the GDP by 6.7396% on average. The positive effect of commercial banks' credit to the industrial sector on industrial sector performance aligns with the findings of earlier empirical studies like Bada (2016), John and Terhemba (2016), Chukwunweike (2018), Andabai and Eze (2018), Kalu et al. (2017), Akinola et al. (2020), and Effiong and Ekong (2022). Therefore, we can say that finance is an engine of growth within the industrial sector of the Nigerian economy.

Employment in the industrial sector was also observed to exert a positive and significant effect on the industrial sector's contribution to the GDP at the 1% level of significance. A 1% increase in employment in industry will lead to a 1.2729% increase in the industrial sector contribution to the GDP. This is an indication that the diminishing marginal productivity of labor within the industrial sector has not yet been reached. This aligns with the findings of Effiong and Ekong (2022). The prime lending rate was observed to have exerted a positive and significant effect on the industrial sector performance at the 1% level of significance. Though this is against the *a priori* expectation, it could be a pointer that the interest rate within the period of analysis was favorable to boost industrial production within the Nigerian economy. The estimate is an indication that a 1% increase in interest rate will prompt the industrial sector contribution to the GDP to increase by about 0.3233% on average. High interest rate encourages more savings, which therefore provide a larger pool of funds to be borrowed for the expansion of industrial outlets.

The exchange rate exerted a negative and significant effect on industrial sector performance at the 5% level of significance. This implies that an increased exchange rate (exchange rate depreciation) will increase the cost of importing crucial raw materials and industrial inputs, which therefore stifles industrial production within the Nigerian economy. The estimated coefficient indicated that a 1% increase in the exchange rate will lead to a 0.0134% decrease in industrial sector performance in Nigeria. Government expenditure on economic services exerted a positive and significant effect on industrial sector performance at the 1% level of significance. The implication of this is that increased public spending on economic services will spur industrial sector productivity in Nigeria. The estimated coefficient signifies that a 1% increase in government expenditure on economic services will lead to a 3.0395% increase in industrial sector performance on average.

Given the R-squared value of 0.9988, it can be stated that the explanatory variables in the model accounted for about 99.88% of the total variation in industrial sector performance in Nigeria during the study period. The explanatory power of the model was 99.60% after being adjusted for degree of freedom and is still a good fit of the regression line.

In exploring the effect of commercial banks' credit on the performance of the commercial service sector of the Nigerian economy, the estimated regression model is presented in Table 5.

Table 5. Fully Modified Ordinary Least Squares (FMOLS) Regression Result for Model III

Dependent Variable: CMSS Method: FMOLS				
Variable	Coefficient	Std. Error	t-Statistic	Probability
CRCS	1.5412	0.2984	5.1650	0.0006
EMPC	0.5437	0.1395	3.8969	0.0036
PRLR	–0.5702	0.1770	–3.2223	0.0105
EXCR	0.0054	0.0046	1.1675	0.2730
GEXE	–0.5960	0.5055	–1.1790	0.2686
C	24.7336	6.7100	3.6861	0.0050
R-squared	0.9958	Mean dependent var		44.6896
Adjusted R-squared	0.9865	S.D. dependent var		7.6970
S.E. of regression	0.8956	Sum squared resid		7.2181
Long-run variance	0.3713			

Source: Authors' edit

The findings of the regression analysis presented in Table 5 indicated that both commercial banks' credit to the commercial service sector and employment in the commercial service both exerted a positive and significant effect on the performance of the commercial service sector of the Nigerian economy. From the estimated coefficient, a 1% increase in commercial banks' credit to the commercial service sector will lead to an increase in commercial service contribution to the GDP by 1.5414% on average. The positive effect of credit on commercial service sector performance aligns with the empirical study of Chukwunweike (2018). Also, a 1% increase in labor employment in the commercial service sector will lead to a 0.5437% increase in commercial service sector performance; hence, there is diminishing marginal productivity of labor within the commercial service sector.

Prime lending rate exerted a negative and significant effect on the commercial service sector contribution to the GDP at the 1% level of significance. This implies that higher interest rates stifle commercial service sector growth since it increases the cost of borrowing for investments. The estimated coefficient indicates that a 1% increase in interest rate will lead to a 0.5702% decrease in the commercial service sector's contribution to the GDP.

Both the exchange rate and government expenditure on economic services exerted an insignificant effect on commercial service sector performance in Nigeria during the period of analysis. The R-squared indicated that the explanatory variables accounted for about 99.58% of the total variations in commercial service sector performance, and it remained at 98.65% after being adjusted for the degree of freedom. Hence, the estimated model represents a good fit of the regression line.

4.4 Standardized Regression Analysis

In order to ascertain the relative impact of the various credit components on the growth of the Nigerian economy, the standardized regression model was estimated, and Table 6 presents the results.

Table 6. Standardized Regression Model Estimates

Dependent Variable: RGDP*				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Probability
CRAS*	1.1760	0.3622	3.2468	0.0029
CRIS*	2.3331	0.6802	3.4300	0.0018
CRCS*	–0.3552	0.4858	–0.7312	0.4703
R-squared	0.7870	Mean dependent var		0.0000
Adjusted R-squared	0.7728	S.D. dependent var		1.0000
S.E. of regression	0.4766	Akaike info criterion		1.4424
Sum squared resid	6.8152	Schwarz criterion		1.5784
Log likelihood	–20.7988	Hannan-Quinn criterion		1.4881

Source: Authors' edit

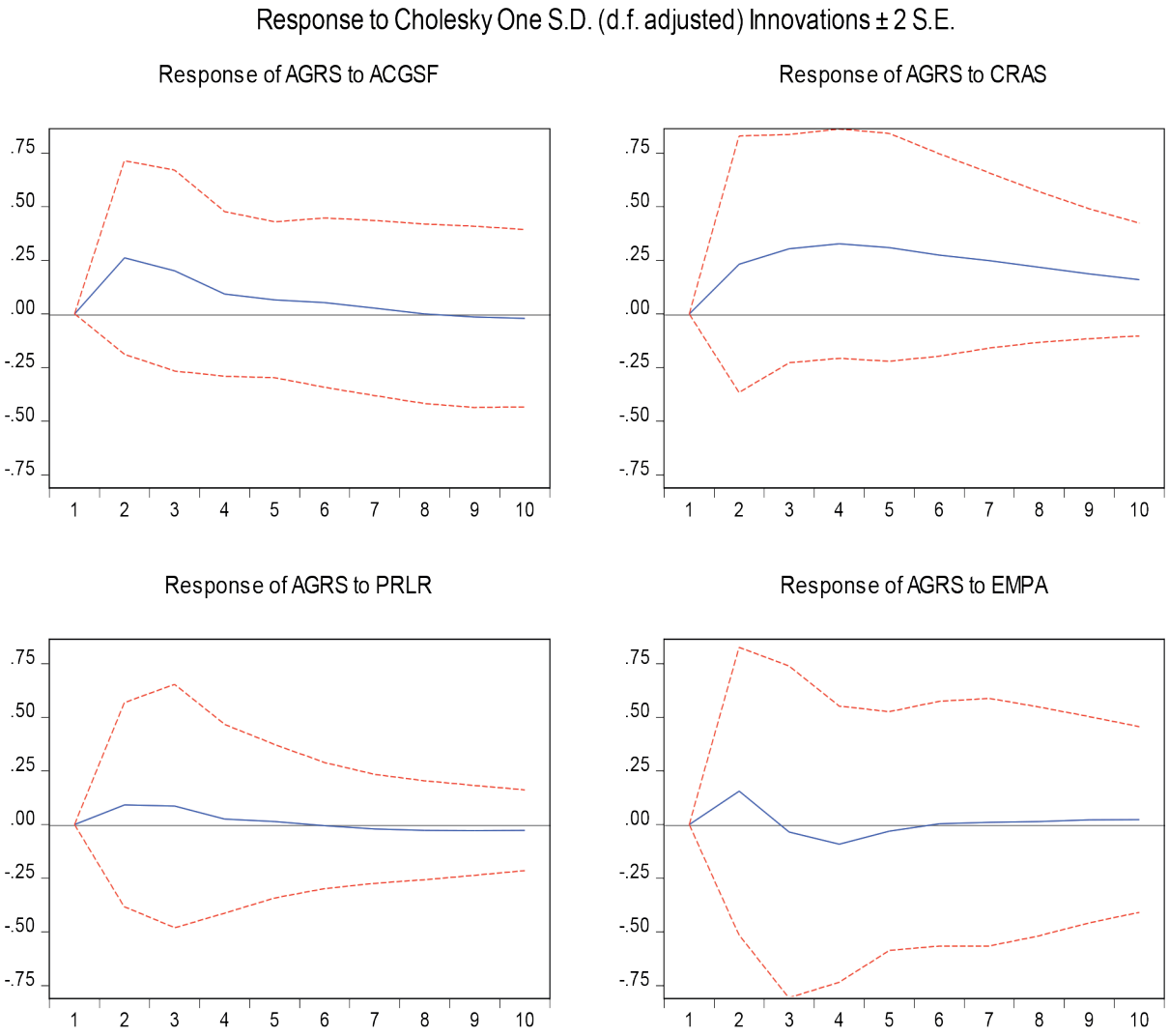
The standardized regression model estimates presented in Table 6 indicated that both credit to the agricultural sector and credit to the industrial sector exerted a positive and significant effect on economic growth. However, credit to the commercial service sector exerted a negative but insignificant effect, as was earlier obtained in the empirical study by John and Lawal (2019). Going by the coefficient, if the (standardized) credit to the agricultural sector increases by one standard deviation, on average, the (standardized) RGDP increases by about 1.176 standard deviations. Also, if the (standardized) credit to the industrial sector increases by one standard deviation, on average, the (standardized) RGDP increases by about 2.3331 standard deviations. From the foregoing, it can be observed that the coefficient of credit to the industrial sector is larger compared to that of others. This implies that credit to the industrial sector impacted RGDP relatively higher compared to other sectorial credit allocations.

4.7 Impulse Response Functions

The impulse response functions (IRFs) have been obtained to check how shocks in key variables could affect the various sectoral performances. In Figure 3, the IRFs showcase how the agricultural sector performance responds to shocks in the agricultural credit guarantee scheme fund, commercial bank credit to the agricultural sector, interest rate, and employment in agriculture. The observed responses indicate that AGRS responds positively to innovations in ACGSF in the short run, after which the impact of the shock decomposes in the long run. Also, the agricultural sector performance responded positively to shocks in commercial bank credit to the sector both in the short run and in the long run, though the impact of the shock tends to decline in the long run. This portrays that credit is of core importance in the development of the agricultural sector of the Nigerian economy. Improved credit availability will spur agri-business expansion, thereby fostering productivity within the sector.

The agricultural sector performance responded positively to shocks in interest rates in the short run, but such an effect tends to decompose in the 7th period, after which the response becomes negative in the long run. This therefore signals the fact that though the farmers may tolerate the rate of interest rate in the short run to borrow to finance their business expansion, such a loan can be a burden in the future, which therefore impedes productive agricultural activities.

Figure 3. Response of agricultural sector performance to shocks in selected variables

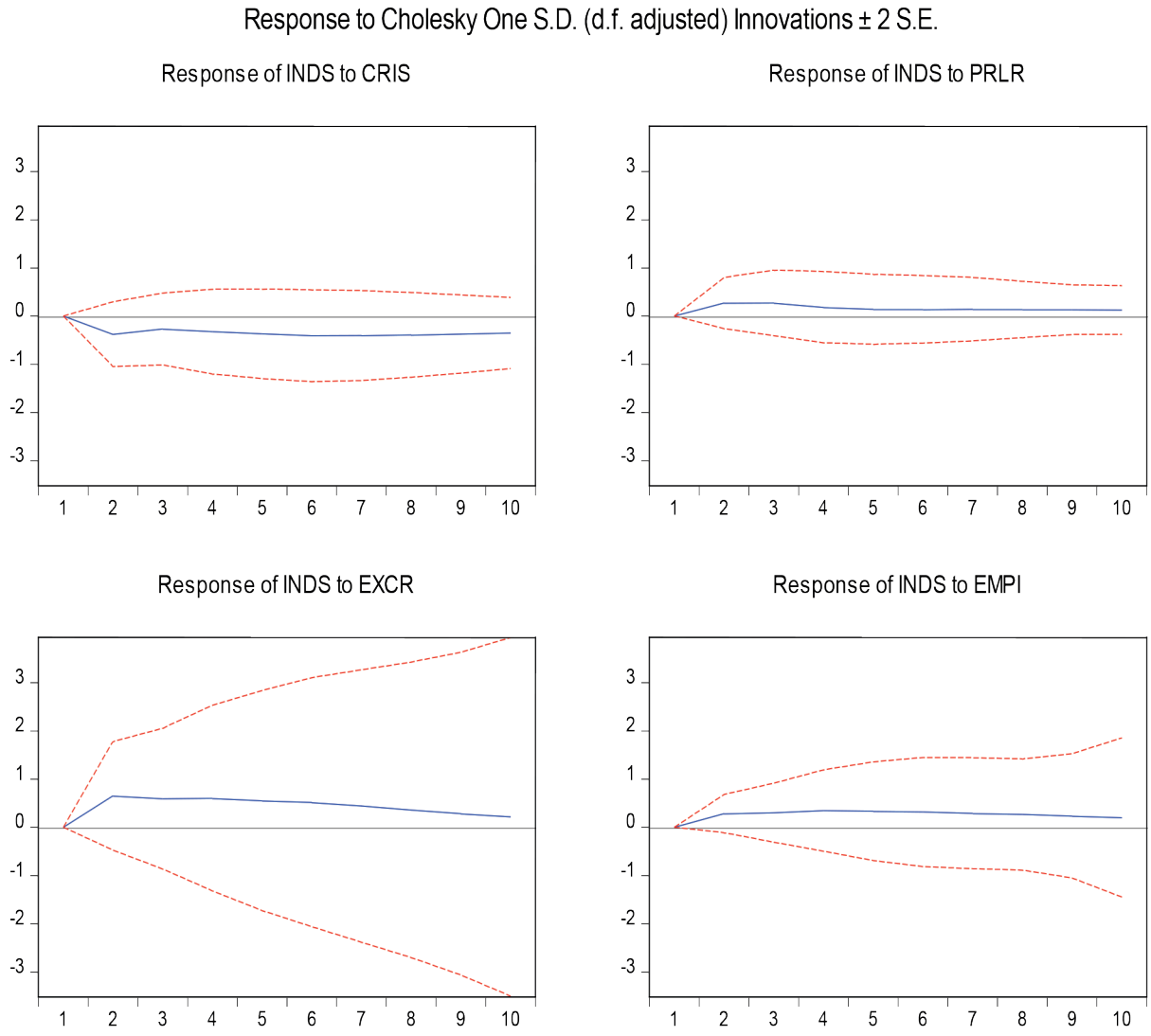


Source: Authors' edit

The response of the agricultural sector's performance to employment in the agricultural sector is not uniform, as it moves between positive and negative responses. The implication of this is that periods of greater labor involvement will spur agricultural productivity, while periods of declining employment within the sector will cause productivity to decline.

In Figure 4, the response of industrial sector performance to shocks in credit to the industrial sector, interest rate, exchange rate, and employment in the industrial sector is presented. From the IRFs, it is observed that the industrial sector performance responded negatively to innovations in credit to the industrial sector. This is contrary to the positive response that the sector should have from innovations in credit supply. This, therefore, underscores the fact that positive credit shocks will not drive the needed growth within the agricultural sector. This is a reflection of the need for the provision of the required economic overheads that are crucial for industrial enterprises to thrive, rather than greater reliance on credit to spur productivity.

Figure 4. Response of industrial sector performance to shocks in selected variables



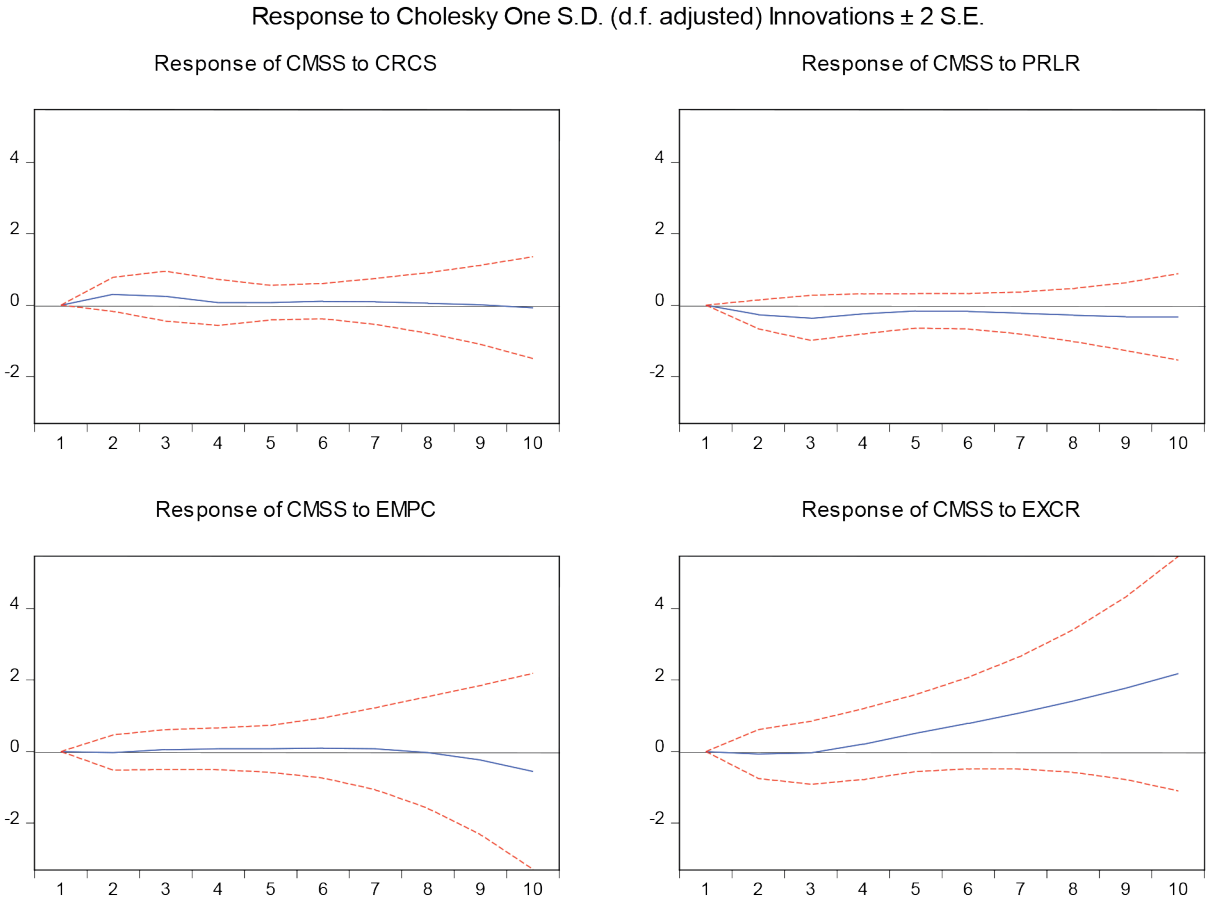
Source: Authors' edit

Though the industrial sector's performance responded positively to innovations in interest rates, such a response is weak and tends to decompose in the long run. The industrial sector's performance, however, responded positively to innovations in the exchange rate. This underscores the fact that improvement in the foreign exchange market through a favorable exchange rate policy will spur the capacity of industrialists to import the needed input for production at a cheaper rate, thereby aiding improved industrial operations. It is also observed that industrial sector performance responded positively to innovations in employment within the sector, both in the short run and in the long run. This signals that increased employment within the industrial sector, given that the marginal productivity of labor is not zero, will spur productivity within the sector.

On the response of the commercial sector to shocks in credit supply, interest rate, employment in the sector, and exchange rate, Figure 5 presents the impulse response function, where it can be observed that commercial bank credit to the commercial service sector only improves the sector's performance in the short run, after which the impact decomposes in the long run. This, therefore, signals the validity of the structuralists' hypothesis whereby banks have a limited role

to play in the provision of investment finance to firms after a certain period. This is because over time, businesses will rely on their retained earnings for their business expansion; hence, credit plays a less important role in the provision of finance for expansion in the long run.

Figure 5. Response of service sector performance to shocks in selected variables



Source: Authors' edit

It is further observed that the commercial service sector performance responds negatively to shocks in the interest rates. Consequently, a positive shock in the interest rate will discourage borrowing, thereby causing a decline in investment within the commercial service sector. In addition, the commercial service sector performance is less responsive to shocks in employment in the short run; however, the effect response becomes negative in the long run, showcasing the possibility of a capital-intensive mode of operation in the long run. The commercial service sector responded positively to shocks in the exchange rate. This portrays that improvement in the foreign exchange market could serve as catalysts for improved commercial service sector performance in Nigeria.

4.8 A discussion of the major findings

One of the key findings of the study is that commercial bank loans exerted a positive effect on all of the sectors (agriculture, industry, and commercial service sectors) of the Nigerian economy. This is an indication that increased credit allocation will help spur the performance of these sectors by increasing their productivity since credit is a crucial capital for production.

Hence, the findings of the study point out the role of the financial system in mobilizing financial resources to the real sector of the economy and therefore support the supply-leading financial hypothesis (Levine, 2005; Levine, 1997; King & Levine, 1993b; McKinnon, 1973; Shaw, 1973). Consequently, a developed financial system will aid in the efficient allocation of credit to the key sectors of the economy at the lowest possible cost, and this can spur the performance of such sectors.

The prime lending rate was observed to exert a positive effect on agricultural and industrial sector performance, while the effect on the commercial service sector was negative. This denotes the fact that different sectors of the economy cannot do well given a universal interest rate. Consequently, the prevalent interest rate during the study period was only favorable to the agricultural and industrial sectors but stifled growth within the commercial service sector of the Nigerian economy.

Another important finding of the study is that employment in each of the sectors positively affected their respective performance. Consequently, there are still potentials for these sectors to grow if more labor is employed. This portrays, therefore, the absence of diminishing marginal productivity of labor within the agricultural, industrial, and commercial service sectors of the Nigerian economy. Thus, greater outputs will be obtained from each of these sectors if more labor is combined with the available capital to boost production in each of the sectors.

It was also observed that credit to the industrial sector exerted a relatively greater impact on the economic growth of Nigeria compared to credit to the agricultural and commercial service sectors. Since the industrial sector has greater spillover effects compared to other sectors of the economy, it has been regarded as an engine of growth (Kaldor, 1966) and consequently, credit allocated to this sector will boost productivity within and beyond the sector, which will spur growth.

5 Conclusions

This paper examined the effect of credit to different sectors of the Nigerian economy on the performance of those key sectors. Specifically, the study examined: the effect of commercial banks' credit to the agricultural sector on agricultural sector performance; the influence of commercial banks' credit to industrial sector on industrial sector performance; the influence of credit to the commercial service sector and commercial service sector performance; and the relative impact of credit to agricultural, industrial, and commercial service sectors on the growth of the Nigerian economy. Time series data from 1991 to 2023 were deployed in the study and were obtained from the Central Bank of Nigeria's statistical bulletin and the World Development Indicators. The data analysis was conducted using the Augmented Dickey-Fuller (ADF) unit root test to ascertain the order of integration of the variables, the Hansen Parameter Instability test to check for the existence of cointegrating relationship in the models, the Fully Modified Ordinary Least Squares (FMOLS) to estimate the parameter estimates, and the standardized regression analysis to ascertain the relative impact of the sectorial credit to the growth of the Nigerian economy.

The result of the unit root test reported that the variables were integrated at a higher order of first difference and second difference. Therefore, the test for cointegration was conducted, and the result reported evidence of a cointegrating relationship in the three models. Given the higher order of integration, a cointegrating regression based on the FMOLS approach was utilized, and the results are briefly stated as follows.

Commercial banks' credit to the agricultural, industrial, and commercial service sector exerted positive effect on the performance of their respective sectors, though that of the agricultural sector was insignificant. However, the agricultural credit guarantee scheme fund (ACGSF) has been potent in spurring productivity within the agricultural sector of the Nigerian economy. Therefore, increased credit to the industrial and commercial service sectors was associated with an increase in their respective sectors' performances.

Employment in agriculture, industry, and commercial service sectors all exerted positive and significant effect on their respective sectors' performances. Therefore, increased labor employment in each of the sectors will lead to increased performance since there is no diminishing marginal productivity of labor across the various sectors.

Prime lending rate was observed to exert a positive but insignificant effect on the performance of the agricultural sector, while the effect on the industrial sector was positive and significant. Thus, the interest rate was favorable in boosting productivity in the industrial sector. However, the effect of interest rate on the commercial service sector was negative and statistically significant.

Government expenditure on economic services was observed to exert a positive and significant effect on industrial sector performance in Nigeria. However, its effect on the agricultural sector was negative and significant, while for the commercial service sector, it was negative but insignificant. Thus, government expenditure on economic services boosted industrial sector performance in Nigeria during the period of analysis.

While the exchange rate exerted a positive and significant effect on agricultural sector performance, it generated a positive but insignificant effect on the commercial service sector. Its effect on the industrial sector was, however, negative and statistically significant. This means that exchange rate depreciation retards industrial sector performance but boosts agricultural sector performance in Nigeria.

The standardized regression model was also estimated, and the result indicated that both credit to the agricultural and industrial sectors exerted both positive and significant effects on the economic growth of Nigeria, while credit to the commercial service sector exerted a negative but insignificant effect. With respect to their relative impacts, credit to the industrial sector was observed to have exerted the greatest impact on economic growth in Nigeria during the study period. The paper thus concluded that commercial banks' credit is a crucial factor that will spur growth within the Nigerian economy.

6 Recommendations

Based on the study's findings, the following practical recommendations are proposed, along with suggestions for the relevant organizations in Nigeria to carry them out and the recommended timeframes for implementation.

A) A timely release of the agricultural credit

Recommendation: Increased credit to the agricultural sector is crucial to combat food price inflation and enhance agricultural production. However, it is essential that funds are released to farmers in a timely manner to ensure they are used effectively for intended purposes, such as farm inputs and production enhancements. Delays in the disbursement of funds can lead to misuse or diversion, diminishing the intended impact.

Relevant Organizations: The Central Bank of Nigeria (CBN), in collaboration with the

Nigerian Agricultural Credit Guarantee Scheme Fund (ACGSF) and the Federal Ministry of Agriculture and Rural Development (FMARD).

Timeframe: Immediate implementation, with continuous monitoring and evaluation over the next 12 months. The CBN and ACGSF should expedite the disbursement process, ensuring that funds are accessible during planting seasons (typically from January to June).

Implementation Action: Establish a timeline and monitoring mechanism for the prompt release of funds and ensure that agricultural loans are linked to proper use and timely repayments.

B) An increase in credit allocation to the industrial sector

Recommendation: To stimulate industrial productivity, it is necessary to increase credit allocation to the industrial sector. This should be accompanied by strategic support from the Bank of Industry (BOI), which should oversee the monitoring, supervision, and evaluation of the credit utilization.

Relevant Organizations: The Bank of Industry (BOI), in partnership with the Central Bank of Nigeria (CBN) and relevant regulatory agencies such as the Federal Ministry of Industry, Trade, and Investment (FMITI).

Timeframe: Implementation should commence immediately with an increased focus over the next 24 months. Industrial credit allocations should be boosted annually to ensure sustainable growth in the sector.

Implementation Action: The BOI should roll out tailored credit programs that are well-monitored for specific industrial sectors such as manufacturing, agro-processing, and construction. CBN should facilitate the release of industrial credits, backed by robust support and tracking mechanisms from BOI.

C) Channeling credit to the commercial services sector

Recommendation: Commercial banks should significantly increase their credit allocations to the commercial services sector, but this should be done cautiously. Credit allocation should prioritize sectors such as trade, general commerce, oil and gas, real estate, and power and energy, while ensuring that funds are not diverted for speculative purposes, especially within the financial sector.

Relevant Organizations: The Central Bank of Nigeria (CBN), Nigerian Stock Exchange (NSE), and the National Economic Reconstruction Fund (NERFUND).

Timeframe: Implementation should be phased in over the next 18 months, with a focus on developing targeted programs for specific sub-sectors.

Implementation Action: The CBN should introduce targeted credit schemes, focusing on productive sectors, with strict guidelines to ensure funds are directed toward businesses engaged in real production rather than speculative activities. These programs should be closely monitored by relevant bodies such as NERFUND and NSE.

D) Credit rationing in favor of the industrial sector

Recommendation: Given the findings of this study, prioritizing the industrial sector for credit allocation will have the most substantial effect on overall economic growth. Credit rationing in favor of the industrial sector should be a consistent policy, supported by continuous assessment and adjustment to ensure optimal economic outcomes.

Relevant Organizations: The Central Bank of Nigeria (CBN), Bank of Industry (BOI), and the National Planning Commission (NPC).

Timeframe: Immediate policy adoption, with quarterly reviews and adjustments over the next 24 months.
Implementation Action: The CBN should introduce formal guidelines for credit rationing to direct resources primarily toward the industrial sector. The NPC should play a key role in forecasting the future needs of the industrial sector, ensuring that economic planning aligns with credit distribution policies.

These recommendations are aimed at addressing critical gaps in credit allocation and ensuring that such credit allocations have a meaningful impact on Nigeria's economic growth. Each recommendation involves the collaboration of key financial and regulatory institutions to facilitate effective implementation and long-term sustainability. Regular monitoring and adaptive policy measures will be required to ensure that these initiatives generate the desired economic outcomes.

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