DISAGGREGATED DEPOSIT MONEY BANK CREDIT AND AGRICULTURAL SECTOR PERFORMANCE IN NIGERIA (1981-2022)

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ABSTRACT

 The study sought to investigate the disaggregated impact of deposit money banks credit on the agricultural sector performance in Nigeria from 1981 to 2022. The disaggregated bank credit served as independent variable while the agricultural sector performance served as the dependent variable. The base year was established in 1981, marked by the national strike led by the Nigeria Labor Congress (NLC) during the military regime, resulting in a two-week cessation of commercial operations. The study identified and assessed peculiar areas of agricultural program and its percentage contribution to GDP unlike most of the empirical works so far reviewed in this context where agricultural sector is not disaggregated into crop, forestry, fishery and livestock so as to identify areas to channel financial resources more than others. Data were sourced from CBN bulletin and world development indicator. The specific objective is to☉1) To examine the impact of ratio of agricultural credit to real gross domestic product on crop production output,(ii)To evaluate the effect of ratio of agricultural sector credit to real gross domestic product on forestry

output, The result showed that (i) Ratio of agricultural sector credit to real gross domestic product have a positive and significant impact on crop production,(ii)Ratio of agricultural sector credit to real gross domestic product   have a positive and significant impact on forestry output. Based on the findings of this study, it is therefore recommended that (i) The government should improve its funding in the agricultural sector in order to grow the economy. The government should improve her budgetary allocation to agriculture at all level as this will improve the economy. (ii) Policy makers like the bank of industry, central bank of Nigeria should ensure that close supervision and adequate loans are provided for agricultural activities as this will help grow the economy.

Key wards: Deposit money banks , Agric Sector, Unit root, Cropping, Forestry, GDP

INTRODUCTION

The substantial increase in crude oil revenue during the early 1970s significantly contributed to the decline of the agricultural sector. Less than 50% of Nigeria's arable land is currently under cultivation, predominantly by smallholder and traditional farmers employing outdated production methods yielding low harvests. Smallholder farmers encounter various challenges, including limited access to modern inputs and credit, inadequate infrastructure, constrained market entry, land degradation, insufficient environmental conditions, and inadequate research and extension services. Consequently, meeting the financial needs of these farmers proves to be a challenging endeavor. Since 1970, the Nigerian administration has recognized the unhealthy condition of the nation's agricultural sector and has endeavored to tackle the problem by formulating and executing an array of policies and initiatives. This endeavor will involve the establishment of extensive mechanized farms by both the federal government and the states. The challenges confronting the agricultural sphere can be discerned by breaking down agricultural production into its fundamental components. The substantial food imports on a large scale in Nigeria, which commenced in the 1980s and persist to this day mainly to bolster domestic supply during this period, underscore the inadequacy of the country's food output.

In present-day Nigeria, a notable proportion of farmers, particularly those residing in rural regions, experience impoverishment. This predicament has been exacerbated by a decline in agricultural yield, contributing to a marked escalation in income inequality. Moreover, notwithstanding the availability of credit facilities, the rapid growth of importing certain agricultural goods—which

previously constituted the bulk of agricultural exports, primarily by small-scale farmers is evident. Although schemes and policies for agricultural credit have been set in motion to fortify the sector in a manner that would render other genuine sectors more advantageous in providing raw materials, endeavors to promote economic development through agricultural credit have been fruitless over time. Prospects for Nigeria include economic growth, increased food production, and heightened per capita income, diminished poverty levels, and a reduction in income inequality.

It is conspicuous that agricultural production, particularly in the realm of food, embodies an economic and political quandary in today's Nigeria. The prevalent issue surrounding exorbitant food costs is inseparable from the overall economic well-being due to its adverse repercussions. These predicaments are not only of concern to the government, which would prefer a moderate uptick in food prices, but are also of significant interest to consumers whose earnings are being eroded by the steep food prices. Consequently, it has become imperative to scrutinize the potential factors accountable for this situation and any economy unable to furnish ample sustenance for its populace and agricultural industries becomes highly uncertain in its quest to foster economic growth and advancement.

Contemporary times witness a surge in financial allocations to agricultural advancement. Finance possesses the capacity to impact economic growth, stagnation, or regression within any given economic framework. The Nigerian government comprehends the criticality of finance, given that agriculture stands as one of its primary pillars of sustainability. Access to financial resources for agriculture can incentivize the sector to perform more effectively, stimulate productive expansion, and assist fledgling enterprises in their viability. Financial resources also elevate mean labor and capital inputs, thereby augmenting production yields. Despite the potential advantages of financing agriculture, there remains a persistent risk of farmers defaulting on their loan repayments.

Nigeria has the potential to attain prosperity and advancement through the agricultural sector. The underpinning of a nation's economic and industrial progress lies in an efficient agricultural production framework (Adamgbe, Belonwu, Ochu & Okafor, 2020). The population of Nigeria has historically relied on the strong agricultural sector, which not only significantly contributes to GDP growth but also generates a substantial portion of non-oil revenue (Odetola & Etumnu, 2013). Nigeria has the potential to achieve prosperity and advancement through agriculture. An effective agricultural production system implicitly serves as the cornerstone of a country's economic and industrial development (Adamgbe, Belonwu, Ochu & Okafor, 2020).

The population of Nigeria has long depended on the robust agricultural sector, which plays a crucial role in GDP growth and non-oil revenue generation (Odetola & Etumnu, 2013). Nevertheless, studies have indicated that a continual decrease in the production of groundnuts, palm oil, cocoa, and cotton has resulted in Nigeria missing out on export opportunities worth $10 billion annually (National Bureau of Statistics [NBS], 2021). This underscores the importance of accelerating the growth rate of agricultural output in alignment with Nigeria's economic structure. Over the past two decades, there has been an increase in government budget allocations to support the agricultural sector. For instance, in 2013, N 83.20 billion (1.66% of the total budget) was designated for agriculture. In 2017, N135.6 billion, equivalent to 1.8% of the total budget of N7.44 trillion, was allocated to the agricultural sector. The sector witnessed another increase in 2018, with N203 billion, representing 2.2% of the proposed budget of N9.12 trillion. However, in 2019, agriculture received a lower budget allocation of N137.9 billion, which accounted for 1.5% of the N8.8 trillion budget (Central Bank of Nigeria [CBN], 2022). Nevertheless, these figures deviate significantly from the global standard for agricultural budget allocation.

Nigeria continues to possess vast tracts of fertile land, rivers, streams, lakes, forests, and grasslands, along with a sizable and vibrant population, which constitute the country's abundant resources. These resources include a highly productive and profitable agricultural sector that has the potential to ensure food and raw material self-sufficiency, create employment opportunities for the growing population, and contribute to foreign exchange earnings for the economy. However, despite these promising prospects, the agricultural industry in Nigeria is perceived as having low productivity, leading to challenges in fulfilling its traditional roles of food provision, job creation, and foreign exchange generation. Various factors contribute to this situation, such as inadequate funding, limited access to credit for local farmers and agro-firms, and inconsistent macroeconomic policies. Researchers like Alabi and Chime (2008) have linked the underperformance of Nigeria's agriculture sector to the current economic difficulties faced by the country.

Agricultural credit, as defined by Chen (2018), refers to financial resources provided to individuals or entities for agricultural production activities, as well as for the storage and distribution of

agricultural goods. This form of credit may take the shape of loans, credit letters, or banker acceptances, and it is essential for farmers to acquire new technologies that often entail higher production costs. Furthermore, Chen emphasized that agricultural loans are crucial for farmers to purchase seeds, fertilizers, pesticides, farming implements, livestock feed, and water, among other necessities. Access to these essential inputs is vital for enhancing farmers' productivity levels.

Improvements in the productivity of agricultural commodities and services are expected to positively impact bank credit, as stated by Udih (2014), and the investment sectors within the economy. It is asserted by Udih that adequate financial support for agricultural projects will not only enhance food security but also boost the entrepreneurial capabilities of young investors. This assertion is based on the premise that significant agricultural productivity can only be guaranteed through a favorable alignment of agricultural entrepreneurship and substantial funding from financial institutions. The allocation of total sectorial loans in Nigeria, as outlined by commercial banks, does not stand out significantly in the context of the agricultural sector, despite its importance. For instance, the credit distribution within the sector fluctuated between 6.9% and 10.66% in 1985; 10.66% and 16.15% from 1985 to 1990; and 16.15% to 17.5% from 1990 to 1995. However, there was a substantial decline from 2000 to 2013, plummeting to figures between 1.67% and 3.44%, as reported in the CBN Statistical Bulletin of 2013.

1.3 Objectives of the Study

The main objective of this study was to investigate the disaggregated impact of banks credit on the agricultural sector performance in Nigeria within the period, 1981-2022.

1.6 Scope of the study.

The examination focuses on the distinct impacts of bank loans on the agricultural sector's productivity in Nigeria. Within this research, Nigeria takes precedence as the central focus. Nigeria stands as the largest economy in Sub-Saharan Africa in terms of market dominance, boasting a population surpassing other African nations. The study revolves around the agricultural sector of the nation. The selection of this sector was influenced by the availability of a comprehensive panel data series spanning from 1981 to 2022. Emphasis was placed on evaluating the performance of the agricultural industry, dissecting deposit money bank credit into components such as crop cultivation, forestry, livestock farming, and aquaculture outputs, all contributing to the actual gross domestic product of the country. The choice of both the nation and the sector was influenced by Nigeria's status as the most densely populated country in Africa. The base year was established in

1981, marked by the national strike led by the Nigeria Labour Congress (NLC) during the military regime, resulting in a two-week cessation of commercial operations.

REVIEW OF RELATED LITERATURE

2.1. Conceptual Review

2.1.1　Agriculture in Nigeria

Collins and Bosworth (1996) stated that the expansion of the agricultural sector is determined by aggregating the growth rates of its four main divisions: forestry, fisheries, crop production, and livestock output. Identifying the factors that drive growth in agriculture is expected to provide more precise insights into how agriculture contributes to economic expansion. This analysis will offer evidence of the pivotal role played by agriculture in fostering Nigeria's economic progress and enlargement. Mody (1981) highlighted the necessity of substantial capital investments in technological advancements and land management practices that facilitated the growth of agriculture, underscoring the crucial inflow of resources into the sector.

2.1.2 Crop Farming

The Nigerian economy heavily depends on agriculture, particularly the cultivation of root and tuber crops, predominantly yam and cassava. According to Ita (2015), tuber and root crops like cassava, yam, potatoes, and sweet potatoes are the primary food staples for the Nigerian population. Agriculture serves as the main source of livelihood for nearly 70% of the rural populace (FAO, 2022). While Benue is recognized as the "food basket of the nation," yam and cassava cultivation is widespread across various states including Cross River, Adamawa, Delta, Ekiti, Imo, Edo, Kaduna, Ogun, Kwara, Ondo, Osun, Plateau, and Oyo (Adetiloye, 2012).

2.1.3 Forestry

A forest is defined as an area of land predominantly covered with trees, as described by Ehiagbanare (2007). Ogunwusi (2012) highlights intense resource exploitation as a factor contributing to the decrease in forest resource availability. Development, within a community, state, or nation, can be characterized as the lawful utilization of local resources to enhance the standard of living for all, according to Oriola (2009). Masoud (2014) explains economic growth as the increase in GDP per capita.

2.2 Deposit Money Banks Credit

In order to enhance societal well-being through the expansion of the agricultural sector, agricultural finance pertains to the allocation of resources, whether public or private, in the form

of equity, grant, or loan (Shreiner and Yaron, 2001). In addition to government funds, it encompasses contributions from non-governmental organizations utilizing matching grants to promote local empowerment, income parity, and sectorial as well as communal progress. When a donation is made without tax implications or when the market price is influenced by an explicit or implicit governmental assurance of responsibility from a development finance institution, private funds are not subsidized, only public funds are (Shreiner and Yaron, 2001).

2.3 Theoretical Framework

2.3.1 Deposit Money Banks Credit

In an effort to evaluate agricultural productivity resulting from the effective utilization of loans from Deposit Money Banks, the research employs the neoclassical theory of production. The classical theory posits that the interest rate is determined by the intersection of capital supply and demand, as well as investment and savings schedules. Conversely, the neo-classical theory underscores the importance of resource availability and efficient utilization to achieve optimal production levels. The provision of loans to farmers, with the expectation of repayment, establishes a direct link between this process and the objectives of Deposit Money Banks and agricultural productivity. Nevertheless, without funds being accessible to farmers and the efficient deployment of resources to maximize production, Deposit Money Banks will struggle to recover such loans. Moreover, improved resource management has the potential to enhance the well-being of farmers. Therefore, the specifications of the neo-classical theory of production can aid Deposit Money Banks in advancing their objective of benefiting from the improved welfare of farmers in the research area.

2.3.2 Loan Pricing Theory

Banks are believed to face a perpetual temptation to institute elevated interest rates with the aim of enhancing revenue or optimizing profits. The identification of the type of borrower at the commencement of a banking association is deemed extremely challenging, underscoring the necessity for banks to remain cognizant of moral hazard and adverse selection concerns while endeavoring to maximize interest earnings. The imposition of excessively high interest rates could exacerbate adverse selection dilemmas as high-risk borrowers may exhibit a stronger propensity to partake in precarious ventures or investments, consequently fostering moral hazard tendencies (Olokoyo 2011). Stieglitz and Weis contend that it is commonplace to encounter situations wherein

the appropriateness of the interest rate established by banks in relation to the risks encountered by borrowers remains elusive.

2.3.3 Theory of Multiple Lending

This proposition suggests that banks should exhibit reduced enthusiasm towards sharing loans and instead concentrate more on equity, mergers, and acquisitions to enhance their lending capacities. Consequently, a lesser degree of supervision and a wider range of options will become necessary. However, the feasibility of this notion hinges on the existence of a robust stock market. Following a phase of amalgamation and in the presence of sturdy equity markets, banks should be less inclined to partake in loan syndication, also referred to as share lending. The infusion of external equity, mergers, and acquisitions augments banks' ability to engage in multiple lending, thereby diminishing the need for heightened diversity and supervision through share lending (Carletti et al., 2009).

2.4 EMPIRICAL REVIEW

Sulaimon (2021) conducted a study on the examination of the Agricultural Credit Guarantee Scheme fund and the performance of Nigerian agriculture. The research revealed a U-shaped relationship between real agricultural GDP and ACGSF. It was concluded that an increase in agricultural loans would significantly enhance the agricultural output of Nigeria. Furthermore, Florence and Nathan (2020) explored the impact of commercial bank loans on the agricultural growth of Uganda. Their findings indicated that while bank credits had minimal short-term effects on agricultural productivity, they had a beneficial long-term influence.

Ogunlokun and Liasu (2021) assessed the relationship between bank financial intermediation and the performance of Nigeria's agriculture sector using data from 1992 to 2017. The model included explanatory variables such as deposit interest rate, gross saving deposits of commercial banks, credits from commercial banks to the agricultural sector, and microfinance banks. The dependent variable, agricultural sector output, served as a proxy for the sector's performance. The study concluded that bank financial intermediation did not impact Nigeria's agriculture sector performance using the Autoregressive Distributed Lag Model. The data illustrated that bank financial intermediation and agriculture sector performance changed simultaneously over time. Additionally, a weak yet positive correlation was found between the success of the agricultural sector and loans from commercial banks. Moreover, a favorable association was discovered between the short- and long-term performance of Nigerian agriculture and the gross saving

deposits of commercial and microfinance banks. The ECM results indicated that while most aspects of bank financial intermediation were beneficial in the long term, they had minimal effect on improving the performance standards of Nigeria's agriculture industry.

Agbenyo, Jiang, and Anthony (2019) investigated the correlation between Ghana's agricultural growth and the era of financial inclusion in the country. Using data from 1980 to 2014, the study applied the Fully Modified Ordinary Least Square method and the Johansen Co-integration methodology (FMOLS). The findings revealed a significant yet weak correlation between financial inclusion and agricultural growth. As per the model estimates, the expected lending interest rate showed a positive and high association, indicating the link between farmers' access to financial services and the expansion of Ghana's agricultural sector.

In the investigation conducted by Liu, Ji, Zhang, An, and Sun (2021) across 31 provinces in China, panel data was utilized to scrutinize the ramifications of rural finance efficiency and scale on agricultural technical innovation from 2003 to 2015. The study also delved into the correlations between the financial development in rural regions and the levels of marketization and economic progression within a specific area. Employing a standard linear squares regression model, the researchers assessed variables such as GDP per capita, the extent of agricultural labor force participation, financial development in rural areas, financial aid for agricultural purposes, and the ratio of individuals under 15 to those above 65. The results underscored a significant and positive impact of increased rural finance on the advancement of agricultural technological innovation, as demonstrated by the empirical evidence. Further exploration revealed that fostering innovation in agricultural technology proves advantageous for the amplification of the rural economy.

Ruben, Nyam, and Rukwe (2020) utilized regression analysis to explore the influence of the Agricultural Credit Guarantee Scheme Fund on agricultural output in Nigeria. Their findings indicated a positive and meaningful effect of the fund on agricultural output in Nigeria. Osabohien, Mordi, and Ogundipe (2020) delved into the availability of loans and the performance of Nigeria's agricultural sector. The Autoregressive Distribution Lag (ARDL) study results indicated that credit played a substantial and advantageous role in elucidating Nigeria's agricultural performance levels. Emphasizing the importance of farmers having sufficient access to credit to enhance their ability to procure necessary agricultural inputs for increased output. Similarly, a study in Vietnam by Anh, Gan, and Anh (2020) advocated for increased credit availability and enhanced efficiency of agricultural credit by the government. Investigating the impact of commercial banks' agricultural

credit on agricultural growth, Nakazi & Sunday (2020) from Uganda, utilizing the Autoregressive Distributed Lag (ARDL) analytical tool, revealed that credit had a significantly positive influence on agricultural output. They suggested governmental expansion of credit availability through mechanisms facilitated by commercial banks.

Oje-Okoro's (2019) exploration of the agricultural sector's contributions to Nigeria's economic advancement utilized multiple regression analysis. The outcomes revealed a favorable relationship between GDP, foreign direct investment (FDI), domestic savings, government expenditure on agriculture, and economic progress. Additionally, the research unveiled that foreign direct investment (FDI), domestic savings, and government spending on agriculture could elucidate 81% of the fluctuations observed in GDP.

In their 2019 analysis, Aminu & Anono scrutinized the impacts of the petroleum and agricultural sectors on the GDP of the Nigerian economy from 1980 to 2018. This investigation involved the application of the Augmented Dickey-Fuller technique to assess the unit root property of the series and the Chow breakpoint test to ascertain the existence of a structural break in the economy. The outcomes of the Chow breakpoint test and the unit root test suggested the absence of a structural break during the period under examination, with all variables in the model demonstrating stationary at the first difference. Moreover, the findings indicated that, despite both sectors positively influencing the expansion and progress of the economy, the agricultural sector exhibited a more substantial contribution compared to the petroleum sector. A thriving agriculture sector can thus be linked to enhanced per capita growth within an economy.

By employing annual data sourced from the Central Bank of Nigeria, Ideba, Iniobong, Otu, and Itoro (2019) conducted an analysis on the relationship between public expenditure on agricultural capital and economic growth in Nigeria within the period of 1971 to 2018. The examination of the data involved the application of the Granger Causality test, the Johansen maximum likelihood test, and the enhanced Dickey-Fuller test. Results from the Johansen co-integration test indicated a lasting connection between all explanatory variables and the dependent variable. The study revealed a positive impact of agricultural public capital expenditure on economic growth through the parsimonious error correction model. Furthermore, findings from the Granger Causality test pointed towards a unidirectional association between public capital expenditure in agriculture and the growth of the agricultural economy, indicating that growth in national agricultural economy is driven by investments in agricultural public capital rather than the other way around.

Utilizing the growth accounting framework and a time series dataset spanning from 1960 to 2018, Tolulope & Chinonso (2019) explored the significance of the agricultural sector in Nigeria's economic development. Their research confirmed the vital role played by the agricultural sector in the economy by demonstrating its consistent and favorable contribution to economic growth in Nigeria using the Granger causality test. However, no evidence of a reverse relationship was identified.

METHODOLOGY

3.1   Research Design

The ex post facto and descriptive research designs were employed in this investigation. A study design serves as a blueprint guiding the researcher in their inquiry and analysis, as indicated by Onwumere (2009). It pertains to events that transpired after the fact and implies their historical nature. The anticipation of future events is not within their scope. The ex post facto research strategy, as delineated by Onwumere (2009), is specifically utilized in situations where the researcher aims to refrain from illustrating changes in variables and relies on previously available data. According to Asika (2009), this approach is advisable only when the event being studied has already taken place.

3.2   Nature and Sources of Data

The publications of the Central Bank of Nigeria and various other individual publications obtained from online sources constituted the published materials utilized for sourcing secondary data in the research. The primary sources of data for the study include the World Bank Development Indicators and the statistical bulletin of the Central Bank of Nigeria. Direct information will not be necessary for this purpose.

3.3 Specification of Model variables

The models utilized in this research are delineated and adjusted based on the examined empirical studies conducted by various scholars in the field of agriculture, particularly focusing on crop production, forestry, animal husbandry, and fish farming endeavors. Leveraging a yearly dataset spanning from 1992 to 2017 as sourced by Ogunlokun and Liasu (2021).

The model presented by Ogunlokun and Liasu (2021) is articulated as follows:

The output of the Crop sub-sector is a function of various factors including commercial bank credits allocated to the agricultural sector, gross saving deposits of commercial banks, credits from

micro-finance banks to the agricultural sector, gross saving deposits of microfinance banks, and the prevailing deposit interest rate.The model is stated thus:

CSSO = F (CMCAS, CBGSD, MFBCAS, MFBGSD, DIR)

Where:

ASOP = Agricultural sector output

CMCAS = commercial bank credits to the agricultural sector

CBGSD = commercial banks' gross saving deposits

MFBCAS = micro-finance bank credits to the agricultural sector

MFBGSD= microfinance banks' gross saving deposits,

DIR = deposit interest rate

The independent variables encompass private sector credit extended to crop farmers, government credit allocated to crop farmers, agricultural expenditures, and land, while the dependent variable is defined as the proportion of crop output relative to Gross Domestic Product (GDP). Acting as a covariate, the inflation rate was employed. The research opted to utilize agricultural expenses and land as independent variables in lieu of banks' savings deposits and deposit interest rates.The model is stated thus:

CSSO/GDP = f (AE, LD, INFL)

Where:

 AE = agricultural expenses

LD = land

INFL= Inflation rate

The study displayed the unit root table in table 4.4 specifically for model one for proper estimation.

4.1 Model One

CSSO/GDP = f (AE, LD, INFL)

 Unit root test

 Statement of Hypothesis

H_0 **:** Series has a unit root

H_1**:** Series has no unit root

Decision: Reject the null hypothesis if the augmented Dickey-fuller statistic (ADF) is more negative than the critical value at 5% level of significance, otherwise accept the null.

Table 4.4: **Unit root Table**

Variables	ADF Start	Critical Value 5%	Order of Diff	P-Values	Decision
CRPT/GDP	-5.169183	-2.936942	1(1)	0.0040	Reject null
AGEXP	-4.104013	-2.981038	1(0)	0.0000	Reject null
LD	-4.603197	-3.529758	1(1)	0.0036	Reject null
INFL	-3.050466	-2.935001	1(0)	0.0365	Reject null

Source: Researchers computation

CRPT/GDP= Crop output, AGEXP= Agricultural expenses, LD= Land and INFL=inflation rate, Table4.4 displayed the outcome of the stationary series as tested. Our observations indicated that some of the variables like CRPT and LD are stationary at difference order one 1(1) while AGEXP and INFL are at order zero, since the ADF values in absolute terms are more negative than the critical values at 5% level of significance. The probability value is less than 5% level of significance (0.0000), therefore all the series are said to be stationary at difference order one and zero.

There is need to carry out co-integration test so as to know if the long run relationship exist among the variables using Eagle granger bounds co-integration test since the stationary level was at 1(0) and 1(1).

4.2 Test for Co-integration

CRPT/GDP = f (AGEXP, LD, INFL)

Statement of Hypothesis

H_0 : Series is Co-integrated

H_1: Series is not Co-integration

Decision: Reject the null hypothesis if the value of F-statistics is greater than i(i) bounds at 5% critical value, otherwise accept the null hypothesis .

Table4.5: **Bounds Co-integration Test Table**

VARIABLE	F-STAT	5% SIGN	I(0) bounds	I(1) bounds
CRPT/GDP				
AGEXP	5.3452343	@5%	2.79	3.67
LD				
INFL				

Source: Researchers computation

The value of F-stat is 5.345234, while the value of I (1) bounds at 5% level of significance is 3.67 .The outcome of the test implied that there is evidence of lung run relationship among the variables .This implied that any deviation in the short run, will be corrected in the long run .The speed at which this correction is effected need to be known through the error correction model (ECM). Since there was evidence of long run relationship, we need to test for the speed at which any short run deviation can be corrected in the long run as in table 4.6

4.3 Error Correction Model

Table   4.6   Error   Correction   Model   Table

ARDL Error Correction Regression
Dependent Variable: D(CRPT)
Selected Model: ARDL(1, 0, 0, 0)
Case 1: No Constant and No Trend
Date: 04/06/24   Time: 21:26
Sample: 1981 2022
Included observations: 26

ECM Regression
Case 1: No Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CointEq(-1)*	-0.126731	0.022910	5.531786	0.0000

Source: Researchers' computation

Table 4.6 explain the speed at which the variables can run to equilibrium in the long run, if there is evidence of deviation in the short run, since co-integration has been established in table 3.The coefficient value of (-0.126731) and probability value of T-stat (0.0000) show that any deviation that occurs in the short run take 13 % speed of adjustment to normal in the long run. This is significant at (0.0000) as indicated in the Table 4 since the probability value is less than 5% level of significance.

4.4 Serial Correlation LM Test

Table 4.7 Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.143924	Prob. F(1,21)	0.7082

Obs*R-squared	0.176978	Prob. Chi-Square(1)	0.6740

Source: Researchers' computation

Table 4.7, show the serial correlation LM result of the residual based test where the value of F_statisistic (0.143924) and its corresponding probability value (0.7082), including the value of observed R-squared (0.176978) and its corresponding probability value (0.6740) are not less than 5% level of significance ,therefore the null hypothesis of serially correlated is not accepted

4.5 .**Determination of Lag length**

Decision Criteria; Select the least value among LR,FPE, AIC, SC and HQ

Table 4.8: **Lag Length Table**

VAR Lag Order Selection Criteria
Endogenous variables: CRPT LNAGEXP LAND INFL
Exogenous variables: C
Date: 04/06/24   Time: 21:31
Sample: 1981 2022
Included observations: 25

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-358.6760	NA	46863235	29.01408	29.20910	29.06817
1	-213.8297	231.7542*	1598.346*	18.70637*	19.68147*	18.97682*
2	-200.2161	17.42535	2166.497	18.89729	20.65247	19.38410

Source: Researchers' computation

Table 4.8, displayed several values associated with each criteria; however, selection is based on the least value especially among those values marked asterisk. AIC Colum at lag 4, with a corresponding value of 1870637* is taken as the lowest value in the table, therefore lag 4 is selected as the lag length for model two.

The study test for hypothesis using Robust Least Squares for parameter estimation since the relevant preliminary tests were carried out accordingly as displayed in table 4.9 below.

4.6 **Test of Hypothesis One**

Restatement of hypothesis in null and alternate form.

H_0: Ratio of agricultural sector credit to real gross domestic product did not have positive and significant impact on crop production output of the economies of Nigeria.

 H_1: Ratio of agricultural sector credit to real gross domestic product have a positive and significant impact on crop production output of the economies of Nigeria.

Decision Criteria - Accept the null hypothesis if the coefficient of the explanatory variables are not positively signed and the probability value of t-statistic is not less than 5% level of significance, otherwise reject the null hypothesis.

Table4. 9: Robust Least Squares Model Table

Dependent Variable: CRPT

Method: Robust Least Squares

Date: 04/06/24   Time: 21:34

Sample (adjusted): 1981 2007

Included observations: 27 after adjustments

Method: M-estimation

M settings: weight=Bisquare, tuning=4.685, scale=MAD (median centered)

Huber Type I Standard Errors & Covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.
LNAGEXP	1400.404	88.71741	5.78499	0.0000
LAND	208.4063	12.50860	16.66105	0.0000
INFL	-3.214112	1.424265	-2.256680	0.0240

	Robust Statistics			
R-squared	0.639363	Adjusted R-squared		0.609309
Rw-squared	0.945162	Adjust Rw-squared		0.945162
Akaike info criterion	60.32533	Schwarz criterion		67.98763
Deviance	1549377.	Scale		163.3014
Rn-squared statistic	738.7159	Prob(Rn-squared stat.)		0.000000

Source: Researchers computation

Layout of estimated results

Table 4.9, showed robust least squares model, the outcome of the test where the coefficients of the explanatory variables are associated with non- negative values except inflation rate (-3.214112) . This implied that there is evidence of positive impact of these variables mentioned (LNAGEXP) and (LAND)on the dependent variable. The corresponding probability values of all the explanatory variables are less than 5% level of significance as indicated in the same table 7.

There is evidence of 63% level of explanation on the impact of the explanatory variable on the explained variable, leaving a balance of 37% unexplained as a result of variables not accounted for or not included in the model The probability value of F-statistic (0.0000) indicate that the overall regression is statistically significant since the value is less than 5% level of significance.

Decision- Ratio of agricultural sector credit to real gross domestic product have a positive and significant impact on crop production output of the economies of Nigeria. There is evidence of positive coefficient values of the explanatory variables and its corresponding probability values which is less than 5% level of significance.

4.7 Test of Hypothesis Two

Statement of hypothesis in null and alternate form

H_0: Ratio of agricultural sector credit to real gross domestic product did not have positive and significant impact on forestry output of the economies of Nigeria.

H_1: Ratio of agricultural sector credit to real gross domestic product have a positive and significant impact on forestry output of the economies of Nigeria.

Decision Criteria- Accept the null hypothesis if the coefficient of the explanatory variables are not positively signed and the probability value of t-statistic is not less than 5% level of significance, otherwise reject the null hypothesis.

Autoregressive Distributed Lag Model (ARDL)

$$FOP/GDP_{t-1} = \beta_0 + \beta_1 ACGSFF_{t-1} + \beta_2 LB_{t-1} + \beta_3 TOPN_{t-1} + INFL + \mu$$

Table 4.14: ARDL Table

Variables	Coefficients	t-statistics	P-Values	R-squared	DW-Start.	Pro(F-stat)
FOPT(-1)	1.320931	11.65196	0.0000	94%	1.83	0.0000
ACGS(-1)	0.304035	3.094534	0.0057			
LABOR(-1)	6.46E-05	5.650894	0.0000			
TOPN	0.250952	0.863394	0.3982			
INFL	-0.012704	-0.067656	0.9467			

Source: Researchers computation

Layout of estimated results

Table showed the outcome of ARDL test where the coefficients of the explanatory variables are associated with positive values except INFL (-0.012704). . This implied that there is no evidence

of negative impact of these variables mentioned on the dependent variable. The corresponding probability values of all the explanatory variables are less than 5% level of significance as indicated in the same table 4.14.

There is evidence of 94% level of explanation on the impact of the explanatory variable on the explained variable, leaving a balance of 6% unexplained as a result of variables not accounted for or not included in the model. The Durbin Watson statistics (1.83) indicated presence of slight serial correlation. The probability value of F-statistic (0.0000) indicate that the overall regression is statistically significant since the value is less than 5% level of significance.

Decision- Ratio of agricultural sector credit to real gross domestic product have a positive and significant impact on forestry output of the economies of Nigeria. There is evidence of positive coefficient values of the explanatory variables and its corresponding probability values which is less than 5% level of significance. .

4.8 DISCUSSION AND INTERPRETATION OF RESULTS

The work sought to examine the impact of disaggregated deposit money banks credit and the agricultural performance in Nigeria from 1981 to 2022 through analytical design approach. The explanation and interpretation of our results centered on the five sub objectives associated with some credit channels that facilitate agricultural performance, making waves on agricultural development.

Objective One: To examine the impact of ratio of agricultural credit to real gross domestic product on crop production output of the economies of Nigeria. Over 240 million tons of these crops are produced annually, spanning up to 23 million hectares, through a variety of agro ecological systems and production methods. According to IITA (2015), the combined value of sweet potatoes, cassava, yams, and potatoes outweighs that of all other staple crops developed in Nigeria. Approximately 49% of all crops produced in Nigeria between 1981 and 2017 were roots and tubers, according to FAOSTAT (2019).If over 240 million tons of these crops are produced annually ,one need to assess the extent to which credit advanced for the production were utilized using the necessary tools .Their study is similar to the findings of our study which indicated a positive and significant impact of bank credit on crop production output in Nigeria from 1981 to 2022.

Iganiga and Unemhilin (2011) scrutinized the value of agricultural output in Nigeria concerning government expenditure on agriculture and other pertinent factors. They constructed a Cobb Douglas Growth Model that factored in variables such as GDP growth rate, population growth rate, average annual rainfall, consumer price index, credit facilities for farmers, and food imports. By employing the Vector Error Correction model and conducting comprehensive data analysis, the study revealed that federal government capital investments were conducive to boosting agricultural production. Similar to the study, we observed that long run relationship exist through the bounds co-integration test carried out although the variables used are not similar to that of Iganiga and Unemhilin (2011) but there was evidence of co-integration since the error correction model were carried out. In like manner we carried out the error correction model and observed that at a significant speed of 13% any deviation in the short run, can be corrected in the long run.

Objective Two: To evaluate the effect of ratio of agricultural sector credit to real gross domestic product on forestry output of the economies of Nigeria. In Nigeria, the development of the forestry sector was hindered by the increase in revenue from oil. Nonetheless, it has played a significant role in the economic landscape of Nigeria despite the challenges encountered by the forestry sector. Job opportunities have been created for Nigerians in the forestry industry, as indicated by Kalu and Okojie (2009).There is evidence of positive and significant impact on loans and advances to forestry through agricultural guarantee credit scheme using ARDL model.

Kalu and Okojie (2009) examined the economic contributions of forests in Nigeria spanning the period from 1970 to 2011. The study utilized Ordinary Least Squares (OLS) as the estimation method, employing GDP as the independent variable and forest product outputs, timber export, and price index of timber, inflation, and exchange rate as the explanatory variables. Upon encountering issues related to multi-collinearity among the explanatory variables and a low R^2 value, a variable was eliminated, resulting in an R^2 of 0.834, signifying an explanatory power of 83.4% along with the statistical significance of all explanatory variables. Notably, timber export, as an explanatory variable, exhibited a positive impact on GDP, aligning with the expected a priori assumption. In similar case, the study applied ARDL model as they used OLS for their estimation and both study arrived as positive and significant effect on GDP in the same country. The R-square of 94% is close to that of their study which is 83% though at different period.

5.1 Findings:

(i)   The impact of ratio of agricultural credit to real gross domestic product on crop production output of the economies of Nigeria as examined revealed that ratio of agricultural sector credit to real gross domestic product had a positive and significant impact on crop production output of the economies of Nigeria.

(ii)   The study evaluate the effect of ratio of agricultural sector credit to real gross domestic product on forestry output of the economies of Nigeria and observed that ratio of agricultural sector credit to real gross domestic product   had a positive and significant impact on forestry output of the economies of Nigeria.

5.2 Conclusion

The study aimed to examine the contribution of deposit money banks on agricultural sector using time series data approach over the period 1981-2022, to observe the impact of disaggregated deposit money bank credit on performance of agriculture in Nigeria by assessing the cropping, and forestry, activities in the country. The results show that all the independent variables have positive relationship with production output in Nigeria respectively, which implies that as crop production, livestock production, forestry production, and fish production increases, real gross domestic product increases.

5.3 Recommendations

Based on the findings of this study, it is therefore recommended that:

(i) The primary suggestion is that the federal authorities allocate a portion of their foreign reserve holdings towards crop production in Nigeria through recoveries, grants, and bilateral partnerships, as this strategy holds promise for enhancing the economic reserves. The result indicated a positive and significant impact of credit on crop performance over the years under study; therefore, the government should improve its funding in the crop production activities in order to grow the economy through improved budgetary allocation to crop production section at all level as this will improve the economy. The results of the study also demonstrate that domestic lending to the local farmers grades agricultural output performance, which have a positive effect if consistently supported. In order to ensure that domestic credit to the farmers is used for the intended purpose and is strictly adhered to for that purpose, the Nigerian government should establish a policy. The study recommended that regulations for agricultural loan financing be implemented in order to increase the stability and quantity of finances that Nigerian farmers can assess.

(iii)　　Policy makers like the bank of industry, central bank of Nigeria should ensure that more loans are provided for agricultural activities as this will help grow the economy. Therefore, the policy conclusion is that in order to reduce (if not totally eradicate) the occurrence of money diversion and to build and enforce strict adherence to the policy on agricultural credit utilization guidance, the government should create a useful and reliable database for farmers.

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