



FINANCIAL INCLUSION, AGRICULTURAL CREDIT AND ECONOMIC GROWTH:
EMPIRICAL EVIDENCE FROM THE BANK OF AGRICULTURE, NIGERIA

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Approval of the Thesis

FINANCIAL INCLUSION, AGRICULTURAL CREDIT AND ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM BANK OF AGRICULTURE, NIGERIA.

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Doctorate of Business Administration (DBA)

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Abstract

FINANCIAL INCLUSION, AGRICULTURAL CREDIT AND ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM THE BANK OF AGRICULTURE, NIGERIA.

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This study examined the empirical relationships among financial inclusion, Agricultural credit, and GDP growth in Nigeria from 2001 to 2021: Evidence from Bank of Agriculture, Nigeria. The ex-post facto research design was adopted to explore the correlation between three variables: Agricultural credits, Financial Inclusion, and Economic growth. The stationary components of the dataset were tested leveraging the Dickey-Fuller (ADF) and Philips-Perron (PP) Tests, as well as the Augmented Distributed Lag (ARDL) bounds testing procedure introduced by Pesaran et al. (2001). DLS was employed to establish the mix of stationarity and non-stationary variables integrated of order 0 and others of order 1. The findings revealed cointegration in the steady state, among all the variables included throughout the analysis. Coefficient value of 11.711 suggest a strong and practically remarkable association between LAGCRDT and LGDP. Ccoefficients for CBB and BCB were 1.30 and 6.39, respectively, while DCB was -728. One-way causation was also found between agricultural credit and economic growth. The study recommends enacting policies by the Nigerian government to bolster agricultural credit access to farmers through BOA and other related financial institutions and using financial inclusion strategies to drive inclusivity, reduce poverty, and to grow the economy.

Keywords: Agricultural credits, ARDL model, Economic growth, Financial Inclusion, Nigeria

Declaration

I declare that this thesis has been composed solely by myself and has not been submitted, in whole or in part, in any previous application for a degree. Unless stated otherwise by reference or acknowledgment, the work presented is entirely my own.

A handwritten signature in blue ink, appearing to read 'A. Bulus', with a stylized flourish at the end.

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AI Acknowledgment

I acknowledge that I have not used AI tools to create, proofread, or produce any text or ideas related to any draft or final version of the thesis.

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I confirm that I retain the intellectual property and copyright of the thesis submitted. I also allow Unicaf University in Zambia to produce and disseminate the thesis's contributions in all media forms known or to come as per the Creative Commons BY Licence (CC BY).

Dedication

Dedicated to my Heroes: my late mother, Ladi Moses Auta, and Danny. Both of them inspired me with the invaluable lesson that it's never too late to pursue one's passion.

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List of Abbreviations

ABP	Anchor Borrowers Programme
ACGSF	Agricultural Credit Guaranteed Scheme Fund
ACSS	Agricultural Credit Support Scheme
ADB	Agricultural Development Bank
ADF	Augmented Dickey-Fuller
AfDB	African Development Bank
AfCFTA	African Continental Free Trade Area
AGCRD	Agricultural Credit
AIC	Akaike Information Criterion
AOG	Agricultural Output Growth
ARDL	Autoregressive Distributed Lag
ARMA	Autoregressive Moving Average
ARIMA	Autoregressive Integrated Moving Average
ASEAN	Association of South East Asian Nations
ATMs	Automated Teller Machines
AU	African Union
BCB	Borrowers from Commercial Banks
BDCs	Bureau de Change
BMS	Broad Money Supply
BOA	Bank of Agriculture, Kaduna, Nigeria
BOI	Bank of Industry, Lagos Nigeria.
BRICS	Brazil, Russia, India, China and South Africa

CACS	Commercial Agricultural Credit Scheme
CB	Community Banks
CBB	Commercial Bank Branches
CBN	Central Bank of Nigeria
CFI	Centre for Financial Inclusion
CGAP	Consultative Group to Assist the Poor
COB	Currency outside Banks
CPS	Credit to Private Sector
CUSUM	Cumulative Sum
CUSUMSQ	Cumulative Sum of Square
DBN	Development Bank of Nigeria
DCB	Deposits with Commercial Banks
DFIs	Development Finance Institutions
DFS	Digital Financial Services.
DMBs	Deposit Money Banks
EDCs	Entrepreneurship Development Centres
ECM	Error Correction Model
ECOWAS	Economic Community of West African States
EFInA	Enhancing Financial Innovation and Access
ESRM	Endogenous Switching Regression Model
FAO	Food and Agriculture Organisation
FCT	Federal Capital Territory
FEAP	Family Economic Advancement Programme
FIs	Financial Institutions
FMARD	Federal Ministry of Agriculture & Rural Development
FMBN	Federal Mortgage Bank of Nigeria.
FMOLS	Fully Modified Least Square.
GDP	Gross Domestic Product
GMM	Generalised Method of Moments
GNS	Gross National Product
GSMA	Groupe Speciale Mobile Association

IBN	Infrastructure Bank of Nigeria
IFC	International Finance Corporation
IFAD	International Finance for Agricultural Development
IFPRI	International Food Policy Research Institute
ILO	International Labour Organisation
KPIs	Key Performance Indicators
KPSS	Kwiatkowski–Phillips–Schmidt–Shin
KYC	Know Your Customer
LBS	Lagos Business School
LR	Logistic Regression
LSA	Least Square Approximation
MFBs	Micro-Finance Banks
MODWT	Maximal Overlap Discrete Wavelet Transform
MSMEs	Micro, Small & Medium Enterprises.
NACB	Nigeria Agricultural & Cooperative Bank
NACRDB	Nigeria Agricultural Cooperative & Rural Development Bank
NBS	Nigeria Bureau of Statistics
NEEDS	National Economic Empowerment Development Scheme
NEXIM	Nigeria Export-Import Bank
NFIS	Nigeria Financial Institution Strategy
NGO-MFIs	Non-Governmental Organisations – Microfinance Institutions
NIRSAL	Nigeria Incentive-Based Risk Sharing System for Agricultural Lending
NSE	Nigeria Security Exchange
NNDC	Northern Nigeria Development Corporation
OLS	Ordinary Least Square
PMIs	Primary Mortgage Institutions
POS	Point of Sales
PP	Philips Perron
PVAR	Panel Vector Auto-regression
RBI	Reserve Bank of India
REM	Random Effects Model

RGDP	Real Gross Domestic Product
ROSCAS	Rotating Savings and Credit Association
RRF	Refinancing & Rediscounting Facility
SAARC	South Asian Association for Regional Cooperation
SACS	Supervised Agricultural Credit Scheme
SAP	Structural Adjustment Programme
SBC	Schwarz Bayesian Criterion
SDG	Sustainable Development Goals
SEAL	Special Emergency Agricultural Loan Scheme
SEC	Securities and Exchange Commission.
SFIs	Specialised Financial Institutions
SMEs	Small and Medium Enterprises
SMECGS	Small and Medium Enterprises Credit Guarantee Scheme
TSLS	Two-Stage Least Square
UAE	United Arab Emirate
UN	United Nations
UNCDF	United Nations Capital Development Fund
UNDP	United Nations Development Programme
UNICAF	University of Nicosia for Africa
UNCTAD	United Nations Conference on Trade and Development
USD	United States Dollar
VAR	Vecto Auto-regression
VECM	Vector Error Correction Model
WAEMU	West African Economic Monitoring Union
WB	World Bank
WDI	World Development Index
WFP	World Food Programme of the United Nations

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CHAPTER 1: INTRODUCTION

Background to the Study

Economic growth, agricultural credit, and financial inclusion are related in ways that have been the subject of significant academic discussion for a while. This is primarily due to the increasing body of documented evidence showing that financial inclusion is necessary and a primary driver of economic growth. In developed nations, strong financial systems with specialised financial products, services, and relevant technologies, along with robust economic policies that open up the economy and eventually attract financial resources from local and foreign investors, are generally responsible for fostering economic progress and expanding access to financial opportunities, thereby bridging financial gaps. The World Bank (2020) report, Ozili (2018), Nwanne (2015), Nwanko and Nwanko (2014); and IFC (2014) all provide evidence to support this. Given the established relationship between agricultural credits and the increase of productive activities in home farm holdings and agribusinesses, many activities impact the economy and cause improved economic activity.

The quality of financial services delivered to an economy (including credits, savings, insurance, transfer payments, and the right technology to power the systems) impacts economic growth. However, it is also possible that higher economic growth rates will be necessary to use financial resources better. Financial inclusion and the economy will improve as credit flows more freely. As a result, scholars are constantly seeking to focus their attention on relationships between access to finance, the growth and prosperity of economies, and the growing macroeconomic fundamentals surrounding the agriculture and rural sectors. Concepts in existing research support Banking and non-banking intermediaries may promote economic development. The Harrod-

Domar theory of growth, which emphasises the capital-output ratio and saving, the neo-classical model of development, endogenous growth theory, Marxian theory (which looks at the six phases of growth), Shumpeterian theory (which concentrates on innovations that improve quality), and Shumpeterian theory are a few examples. Two growth theories relevant to this study are the endogenous growth theory and the neo-classical growth model.

In the delivery and implementation of a nation or state's social and economic emancipation, policy orientation on the interdependencies among financial inclusion, economic growth, agriculture, and rural development has been more prominent since the early 2000s. This has resulted in a notable change in emphasis toward specific regional categories, with a focus on the West Asian and North African countries, the Pacific area, and rising economies in Asia, notably in Sub-Saharan Africa (SSA) and the Indian subcontinent (the Indian-Gangetic region). In these areas, most of the population is either underserved or unserved, and financial exclusion rates are comparatively higher. As may be imagined, this circumstance aided in developing innovative business models, electronic and internet-based transactions, digital technologies such as agent banking and mobile banking, and ways to supply financial services.

According to Nigeria's population demographics, more than 71 million of its people live in extreme poverty, while another 133 million are considered to be experiencing multifaceted poverty (NBS, 2023). Once more, Nigeria was identified as the Global Center of Poverty by the World Data Clock (2019). In light of this, the nation has to take action to combat poverty and the rising rate of financial exclusion while also giving financial inclusion more severe and pressing attention. Neglecting the rising poverty rate harms the nation's economy and citizens (Idris et al., 2020; Iheonu & Urama, 2019). 10.6% and 48.4% of Nigerians were underbanked and unbanked in 2012, respectively (EFInA, 2017; NFIS, 2016). According to the survey, higher percentages were seen

in rural regions. In support of this similar viewpoint, DFIs reported in 2017 how alarmed the nation's government authorities had grown due to the growing state of exclusivity (David-West et al., 2017). They emphasised that the problem has been in the public eye for millennia and that several studies have shown that poverty is a direct source of economic marginalisation.

Although financial inclusion in Nigeria is complex, it impacts the nation's economic growth by integrating people within the mainstream banking channels to improve access to payment service provisions, savings, financial products, credit, insurance, and pensions for the citizens. However, the informal financial industry and the legal sector continue to function independently and rarely interact. Hence, the nation operates a parallel financial system, with a significant portion of its currency moving outside the established banking system. In December 2011, the nation's total non-banking currency was N12.67 trillion (EFInA, 2012). However, based on recent data released by the Nigerian Apex Bank (CBN), up to the end of the first quarter of 2023, over 80% of the N1.6 trillion in total money in circulation, N1.4 trillion, is not in the banking system.

In 2012, EFINA revealed that around 39.2 million adults in Nigeria, or 46.3% of the country's 84.7 million adult population, are financially excluded. Their inability to get governmental or informal funding sources was the reason behind this. As of 2020, estimated at 64.1%, the financial inclusion increase was still far short of the NFIS objective of 80% for that year. After more research, it was discovered that 73.8% of the excluded population were under 45 (working age), 54.4% were female, and 34.0% had no formal education. Furthermore, it was noted that 80.4% of these individuals live in rural regions. According to EFINA (2011), the numbers also showed that in 2011, 28.6 million bank accounts were accessible to over 168 million users, including 89.7 million adults in Nigeria. According to Sanusi (2010), economic growth would be

higher if financial services were available to all demographic groups in a country. From 2009 to 2014, when he served as the CBN governor, he promoted several beneficial changes to Nigeria's financial sector. He initiated several changes meant to revitalise the economic sectors, particularly agriculture, and continuously supported them. During his tenure, NIRSAL was established, the Anchor Borrowers' Programme (ABP) was created, and NFIS's operations were strengthened. This is evident from the fact that inclusive finance, changes to fiscal and monetary regulations, and the new financial mechanisms unveiled in 2011 constitute a significant part of Nigeria's policy. Several FI initiatives that were thought to be essential to achieving the objectives of keeping enough foreign exchange reserves and preserving the value of the naira in global markets were included in the NFIS document. The 2011 NFIS materials included estimates of reasonable and achievable goals that were regularly updated. Together with the new monetary and credit rules, it encouraged financial service providers to provide simple loan access for micro, small, and medium-sized firms. This would increase output and stimulate the export of items other than oil, stabilising the naira.

The issue of access to and use of banking services, or the lack of it, affects both developed and developing nations worldwide. It should be addressed to enhance the ability to get resources and ensure everyone's survival in various economic systems. Thathsarani et al. (2021) assert in their analysis of an economy's potential that people's economic power rises with the accessibility of financial infrastructure. However, millions of individuals are left out of the formal financial (FF) sector due to low incomes and resources in developing nations. According to their argument, financial exclusion lowers the quantity of investment capital that should be accessible to fund an increasing number of economic endeavours. They claimed that access limits the ability to accumulate money. Speaking in further detail, they said that the potential of financial inclusion to

raise the percentage of productive activities makes it essential for economic progress. More financial resources will be available to reduce poverty, create more jobs, improve people's living standards, and expand corporate opportunities for expansion and exploitation.

Since inclusive finance has a built-in multiplier effect on economies, more professionals and policymakers globally are paying it more attention (Charles, 2020). Similarly, Charles and Keller (2020) affirmed that financial inclusion is the sixth most important goal for sustainable development. Onaolapo (2015) and Fadun (2014) also established that financial inclusion has a composite influence on entrepreneurship, employment creation, income disparity reduction, and poverty alleviation, which enables it to promote growth. It is acknowledged that financial inclusion raises people's income levels and improves the economy (Shiro et al., 2023). Analysing the role of inclusive finance in the Sustainable Development Goals (SDG), Keller (2020) noted that access to finance is essential for modernising agriculture, supporting socioeconomic progress, innovation, and entrepreneurship. Islam and Manu (2011) asserted that financial accessibility encourages low-income people to pursue investment and entrepreneurial opportunities, leading to higher productivity and economic growth.

Statistics used by Sehrawat et al. (2016) describe the level of depravity connected to financial exclusion. According to him, over 70% of global population lacks access to formal financial services for essential fiscal needs; 75% of adults do not have a bank account even if their daily income is less than the \$2 international poverty line (World Bank, 2020). In addition, only 50% of people in developing nations have bank accounts. The goal of inclusive finance is to bring to those that are currently outside formal financial system, and so cannot access opportunities like credit, savings, payments, and insurance. Studies have found a connection among inclusive finance and National growth because they increase investment, create jobs, and lessen vulnerability (Ozili,

2020; Michelle, 2019; King & Levine, 1993). Consequently, coordinated effort is essential to ensure accessibility, to diminish the financial burden of accessing goods and services to the nation's economies thereby promoting sustainable development (World Bank, 2018).

Having sufficient, simple, and unrestricted leverage on banking service providers is essential to inclusivity, as it guarantees improved living standards for individuals and businesses. It also entails being close to financial service providers to facilitate simple credit and savings transactions, as well as important initiatives to assist households and economic agents in striking a balance between their inclination to engage in business investments in productive Assets and their desire to spend on the one hand. The economic actors can reduce their risks depending on how much risk they are willing to take. The opportunities that this setting presents are essential, particularly for the less fortunate and impoverished. According to Demirguc-Kunt et al. (2019), a well-functioning financial system benefits entrepreneurs who get irregular revenues from the unorganised sector and are vulnerable to significant shocks related to health and institutions. Zins and Weill (2016) found that over 2.5 billion people had no proper access to financial services, especially those living in the world's poorest regions. They claim that over 300 million individuals, or nearly 80% of the population, live in eleven (11) Sub-Saharan African countries and are considered financially excluded, primarily due to the lack of official bank accounts. This circumstance well demonstrates the importance of financial inclusion for developing countries. Ultimately, Zins and Weill (2016) concluded that the primary cause of the emerging countries' delayed growth in Asia and Africa is a lack of funding. Moreover, financially secure people tend to be more productive since they invest more money and consume less (Liberto, 2021; Ashraf et al., 2006).

According to a different Demirguc-Kunt et al. (2018) study, 1.2 billion people opened accounts with traditional banks or mobile financial service providers, whereas 515 million adults opened an account over three years. By any measure, this development is outstanding. A poll conducted at the time revealed that half of the global population lacked access to credit, insurance and other financial services. Fewer than 25% of people had accounts with official financial institutions, and most of them saved informally through friends and families and other non-traditional means. A 2019 report by Deep Knowledge Analytics and Future Fintech, found that the proportion of people in many economies who are not eligible for financial services is higher than that of adults who live in poverty (earning less than \$2 a day). A study on account ownership and usage that focused on financial inclusion found that the primary factors contributing to people's financial exclusion were living sustainably, having a sizeable basic deposit account balance to keep a bank account, being far from financial institutions, and not having legal protections (Allen et al., 2016).

Due to its prominence in the labour market, agriculture has become the primary source of employment for most Nigerians residing in rural areas. Agriculture was and continues to be the main engine of the non-oil industry, the nation's foreign exchange revenues, and a significant contributor to the nation's GDP. Nigeria implemented various initiatives, programmes, and policies to help reposition the agricultural sector for growth and maximise its agricultural potential. Ayanda and Ogunsekan (2012) listed many of them as the setting up and operationalising of the Marketing and Commodity Storage Boards of the nineteen seventies. In the early seventies, specifically in 1972, the Nigerian Agricultural Bank (NAB) was established. Also founded in the seventies was the programme known as "Operation Feed the Nation" (OFN), which was set up in 1977, followed by the Agricultural Credits Guaranteed Scheme Fund (ACGSF) in 1978. The Nigerian Directorate

of Employment (NDE), the Nigerian Agricultural Insurance Corporation (NAIC), the World Bank-funded Agricultural Development Projects (ADP), and the National Livestock Development Project were all welcomed establishments in the nation throughout the 1990s and beyond. Others that featured in the later year's melliniua include the 2013-launched Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL Plc.), its subsidiary the NIRSAL MFB, and the CBN-funded Anchor Borrowers Programme ABP). Like BOA, these initiatives aimed to improve the flow of capital to small-scale farmers who were previously excluded from receiving loans and advances from commercial banks. Nigerian farmers perceived obtaining loans from commercial banks to fund their farming activities to be a significant issue due to the high cost and extensive paperwork involved. Some authors acknowledged the role that financial services have played in promoting economic growth (Abdullahi & Fakunmoju, 2017; NFIS, 2012; Child, 2008; Abayomi, 2006), and they also asserted that growth is best achieved when all entrepreneurs, without exception, can approach and access facilities from banks and financial institutions, such as loans and advances, insurance, and advisory services, with relative ease. Formerly known as the Nigerian Agricultural Bank (NAB), the Bank of Agriculture (BOA) Limited was established in 1972 (Enorma, 2010). The goal of the Bank's founding, according to Ayanda and Ogunsekan (2012), was to ensure that financial services for agricultural products would always be available, affordable, and accessible along all value chains, with a focus on the micro, small, and medium-sized enterprises (SME) category. Business owners would be in a better position to benefit from the enormous potential and advantages that the agriculture industry provides if they took this move. The bank has now been in existence for about fifty-two years after that. According to Iwuhukwu and Nwobodo (2016), in order for Nigeria to stop the country's population from becoming more and more economically excluded, the nation will need to engage a robust public sector with strong

institutional support in the form of infrastructure for agricultural research and extension, technology-driven commodity futures, adequate input supply mechanisms, and land use management - all of which are crucial factors for any economy's growth. An elaborate financial architecture to finance the above requirements is necessary for this to happen in areas where farming activities are predominant in rural communities.

They are required to help in the early adoption of GAP and to hasten the areal expansion of the rural and agricultural landscapes. Iwuchukwu and Nwobodo (2016) suggested that the Nigerian private sector be included in the stand-alone participation while still advocating for the unrestricted engagement of the private sector in all economies. Patronage should not be limited to portfolio investments and direct investments from abroad or locally. Facilities for agricultural research support, university innovations, and capacity-building initiatives should be available. Finally, large-scale agribusiness farm holdings and companies should be able to raise their own funds from multi-lateral and regional donor agencies such as the World Bank, IFAD, IFC, Food and Agriculture Organisation (FAO), United Nations, AfDB, AFREXIM, and IsDB, as well as national lending agencies such as the DBN, BOA, BOI, NIRSAL, NAIC, etc. Other funding sources include governments and non-governmental organisations (NGOs), both domestic and foreign.

They can also provide different types of farming support, inputs, financial and technical help, the establishment of other support institutions, and technical competencies. In order to promote and expand credit-channeling mechanisms, price-stabilizing monetary and exchange rate windows, and take advantage of fiscal measures that would offer financial incentives to farmers, such as tax breaks for agricultural enterprises and duty-free imports of farm machinery, it is important to monitor macroeconomic measures closely.

The annual budgetary contribution of the three levels of governance in Nigeria (central and subnational governments) is a crucial component of the country's plan for increasing financing for the agricultural sector. This is necessary to ensure that funds are allocated to vital areas of the industry, understanding that money is the essential oil that facilitates higher output and productivity. Financial capital is the lifeblood that fuels productivity and its significance extends across all sectors, from agriculture to industry and services, where it serves as a crucial driver of expansion and development. However, Nigeria's agricultural sector has been plagued by ludicrously low spending, which has prevented the nation from meeting the objectives set forth for several government-funded projects (IFPRI, 2008). For several reasons, this underfunding of agriculture portends grave dangers for a developing country like Nigeria, which relies heavily on its oil industry. One explanation for this is that variations in food costs indicate inflation. Engel's Law, which holds that when household earnings grow, less money is spent on food and other products/services, provides the best explanation for the second. This remark raises questions about the potential effects of price shocks, namely that shocks to domestic agriculture supply and output may harm price stability. As seen by the North Korean food pact and the United Nations Oil for Food agreement in Iraq, respectively, these phenomena draw attention to the problem of food security at a time when it is being utilised both as a weapon of war and a tool for negotiation. Even within the country, during the 1966 Nigeria-Biafra Civil Unrest, the Federal Military Administration employed a food blockade as a strategy of war. The present research investigates the relationships between access and use of financial services, lending to agriculture, and growth of the Nigerian economy. The study strictly places particular emphasis on the activities of Bank of Agriculture, Nigeria. The research is grounded in this premise.

Statement of the Research Problem

Financial preclusion remains a prevalent issue in Nigeria even though the Bank of Agriculture is focused on addressing financial challenges within the agricultural sector. The country struggles with increasing misery, income inequality, and unemployment rates, reinforcing the necessity for an extensive evaluation of the interchange between agricultural credits, access and usage of financial services, and the growth of an economy. This research aims to explore the complex relationships between the three variables, explicitly focusing on the role of Nigeria's Bank of Agriculture in promoting agricultural credit delivery, access to and use of financial services and growth of the Nigerian economy.

Findings from various investigations reveal that 10% of Nigeria's population owns over half its wealth, with 67.1% GDP growth not translating to improved living standards or reduced poverty. Ironically, both economic historians and scholars have seen the nation's GDP growth as exceptional, mainly because it has not significantly raised the quality of living for the general public, improved job opportunities, or decreased the high rates of poverty. Financial inclusion, they say, is crucial for reducing poverty and fostering economic progress. The Bank of Agriculture aims to provide financial services to underserved populations.

According to Oji (2016), financial exclusion persists due to low income, financial illiteracy, and inaccessible banking services. More recently, advanced technologies have improved access, but challenges remain. Initiatives like the Maya Declaration and National Financial Inclusion Strategy (NFIS) aim to increase financial inclusion. In a near-perfect financial system, everyone can and should have easy access to bank loans, insurance protection against a variety of risks, educational and investment opportunities, and the capacity to make safe and straightforward

payments with the assistance of a financial infrastructure that can benefit everyone in the community, particularly women and those with fewer privileges, as claimed by Mader (2018) and Avais (2014).

Demirguc-Kunt and Levine (2008) contend that a successful financial system should encourage the founding of new companies and the growth of current ones. A healthy financial system should increase the ability of people of all ages, including women, youth, and individuals, particularly those at the bottom of the pyramid who are also members of marginalised and vulnerable groups, to feel comfortable conducting transactions with the fewest obstacles possible (Fadun & Silwimba, 2023; Hendricks, 2019; Siddiq, 2017).

Eliminating financial exclusion is a formidable undertaking on a global scale, especially in Asia and Africa. The message has continued to spark curiosity, attention, and heated discussions in several local and national conversations. Loukoianova et al. (2018) noted that the subject is currently a cornerstone of many business plans, strategic objectives, and national budgets. Around the world, many initiatives have been launched to support the financial inclusion of less fortunate people. The fire is still raging, and significant problems are faced in Asia and Africa due to population increase and scarce resources.

The issues that the two continents and many nations face are diverse from one another in terms of culture, race, language, and religion. It is more difficult to narrow the disparities between the rich and the poor, men and women, rural and urban populations, etc. As a result of these factors, and in a bid to provide the affected nations with the crucial support required to hasten the growth of their economies, the World Bank, United Nations (UNs), and International Monetary Fund (IMF) have each contributed to the development of financial inclusion derivatives, suitable for each of these continents, countries, and regions. They also continuously review and reevaluate

their development policies (NFIS, 2018; IMF, 2015a, 2015b; World Bank, 2014; and Abel et al., 2011). Nigeria and Zimbabwe, two of the signatories of the Maya Declaration, started financial inclusion initiatives, which were completed in 2012 and 2016, respectively. Despite the efforts and progress made, there are still considerable differences in financial inclusion across and within the nations.

Africa and Asian nations continue to have notably higher rates of economic exclusion than other regions (Abubakar et al., 2020; Le et al., 2019). Either incorrect methods were employed to promote quicker inclusion, or they were poorly executed, which is why this happened. For example, four years after implementing its 2012 financial inclusion programme, Nigeria, an African developing nation, has a dismal exclusion rate estimated at 68%. With increased usage and deployment of cutting-edge technology, the otherwise dire situation does seem to be improving. No matter how far away the customer resides or how far away they are, digital services have made it feasible, simpler, and faster to conduct business and keep track of changes in assets and liabilities. Inclusive financial services have undoubtedly helped all governments worldwide by accelerating economic development, reducing poverty, and reducing income inequality. Therefore, financial inclusion helps the less fortunate build money and overcome their inclination to be destitute.

While the economic community has long discussed the connection between access to and use of financial services and GDP growth, several investigations have assessed how relationships between access to and use of financial services, economic growth, and poverty reduction are intertwined. The transmission mechanism supports the idea that poverty should be addressed to enhance financial inclusion and growth, which shows that the financial sector has two impacts on reducing poverty. First, to help the poorest of the poor by providing them with easy credit

opportunities, extension and financial advisory support to expand or enhance their income-generating prospects and provide jobs for others. The second route entails economic growth, which benefits low-income people and promotes sustainable development. Numerous studies have accurately shown how having access to the appropriate financial services may improve household well-being and stimulate the growth of small businesses. Furthermore, macroeconomic data demonstrate that nations with high levels of financial intermediation develop faster due to their capacity to reduce income inequality. Nigeria must move swiftly and cooperatively to accomplish its financial inclusion goals, as stated in the 2018 updated NFIS statement.

As stated in Nigeria's Inequality Report (2017), its cycle of poverty may be overcome via deliberate policy action, political commitment, and the active participation of knowledgeable individuals and a vibrant civil society. For this reason, the research was selected. Studies highlight financial inclusion's impact on economic growth and poverty reduction. Since current transmission mechanisms have shown that financial inclusion helps the poor access capital and promotes economic growth, it is only rational that Nigeria addresses its income equality disparity challenges to achieve its financial inclusion goals. To address the identified research gaps, the study aims to conduct an in-depth examination of financial exclusion metrics specifically relevant to the Bank of Agriculture's operations, assess the impact of loans provided by the Bank of Agriculture on Nigeria's economy, with a focus on rural agriculture, to understand the efficacy of existing financial interventions, and thirdly, investigate the complex relationships between agricultural credits, access to and use of inclusive finance, and growth of the Nigerian economy, shedding light on identifiable mechanisms by which these variables interact. In addition to this, the plethora of research findings in various domains provides an initial basis for the current investigation.

This study's findings will contribute significantly to understanding the pivotal role of agricultural credits and inclusive finance in reducing poverty and promoting growth of the Nigerian economy, mainly through the lens of the Bank of Agriculture. By elucidating the interconnections between agricultural credits, access to and use of financial services, and growth of the economy, this research aims to inform policy decisions and strategic interventions tailored to Nigeria's unique economic circumstances.

Purpose of the Study, Research Aims, and Objectives

This research examines how agricultural credits provided by the Bank of Agriculture (BOA) foster farmers' financial inclusion and advance the agricultural industry, economic expansion, and development. More precisely, Agricultural Development Banks (ADB) are known to foster economic growth, especially during global economic downturns (Seibel, 2000). The ADB's operations must be managed appropriately to guarantee sustained economic growth and development. Some scholars argued that inclusive financial structures and markets facilitating credit availability for a sizable segment of the working population - mainly the impoverished and vulnerable- are vital to the growth of economies (Cull, Cull, and Lixin, 2014; Beck, Demirguc-Kunt and Levine, 2008; and Beck, Levine, Loayza, 2000). More markets and a more equitable financial system are required to reduce poverty, promote social cohesion, and generate employment. Furthermore, access to finance contributes to the empowerment of these groups by assisting the most vulnerable in opening bank accounts, saving money, and making wise investment decisions.

The Bank of Agriculture, its affiliated financial institutions, financial inclusion policies that aided in Nigeria's economic expansion, and the factors that created socio-financial segregation

in the country, were all examined in this study. Examining the connection between agricultural credits, access to and use of financial services, and economic expansion in Nigeria is the primary objective of the research, which focuses on the operations of the Bank of Agriculture Limited.

The objectives of this research are to:

Investigate the impact of financial inclusion on economic growth in Nigeria;

Examine the impact of agricultural credit on Nigeria's economic growth with a unique focus on the Bank of Agriculture (BOA), and to

Investigate the long-run connections between Nigerian economic growth, agricultural credit, and financial inclusion.

Significance of the Study

Financial inclusion and agricultural credit are essential for Nigeria's economic growth. This study used secondary data that was retrieved from several sources, including the World Development Indicators (WDI), Central Bank of Nigeria (CBN), Bank of Agriculture (BOA), Nigeria, and National Bureau of Statistics (NBS). Furthermore, a unique finance system was developed specifically for this reason. The fact that at least 75% of the population works in the agriculture sector demonstrates how significant the issue is to all parties involved.

Regression analysis was used to evaluate the data gathered for this investigation. Those who wish to conduct more research in this area might use the study's conclusions as a guide. Horrific levels of poverty, misery, and accompanying melancholy plague Nigeria and the rest of sub-Saharan Africa. This kind of research on financial inclusion (FI) might help bank management find fresh approaches to current problems. According to the Nigerian Financial Inclusion Survey

(NFIS, 2012) over 40% of Nigerians lack access to official or informal financial services. Government officials, including the Presidency, Central Bank of Nigeria (CBN), and Nigeria's Federal Ministries of Finance, Agriculture and Rural Development (FMARD), should be interested in research of this kind that provides helpful information on how to decrease the number of financially excluded people in Nigeria. The results of this study will help reform the country's financial system and initiatives to reduce poverty and eradicate hunger by 2030. Monetary authorities and the international community place the highest weight on its critical role in reducing poverty, improving lives, and expanding prosperity (Nwanko & Nwanko, 2014; Sanusi, 2010).

The interconnectedness among agricultural credits, access to and use of financial services, and GDP growth in Nigeria was another primary emphasis of the current study. Scholars and academics will gain from this study's understanding, which will also expand current knowledge. To adequately explain this field of study and those that are related, future research and studies that may be undertaken to explain the phenomena will unavoidably be informed by an understanding of the significance of agricultural credits, economic growth, and financial inclusion. If successful, this research would provide policymakers with a better knowledge of agricultural credit operations and financial inclusion, enabling them to guarantee the unrestricted flow of financial services in developing countries. It is recommended that policymakers promote financial inclusion initiatives more strongly to strengthen and support financial development policies.

Research Questions and Hypotheses

Research questions

Nigeria's rural areas had an estimated 60% financial inclusion rate, based on data examined by Digital Financial Services (DFS) in 2017 (David-West et al., 2017). As a result of the high

financial exclusion rate in farming communities, Indigenous financial inclusion initiatives must be implemented in a way that is instantly compatible with the rural economy based mostly on agriculture. We believe that this study is desperately needed to address the following research topics, taking into account BOA's role as a trailblazing FI in Nigeria's rural and agricultural sectors;

RQ1 How does financial inclusion impact Nigeria's economic growth?

RQ2 Does agricultural credit from the Bank of Agriculture impact economic growth in Nigeria?

RQ3 Do agricultural credit, financial inclusion, and economic growth exhibit long-run correlations in Nigeria?

There are three schools of thought regarding how financial expansion influences economic development. The connections are emphasised further in the first one. The perspective is based on research by McKinnon (1973), Shaw (1973), Goldsmith (1969), Patrick (1966), Schumpeter (1912), and Bagehot (1873). The second point of view is a by-product of Robinson's (1952) research investigation. The fundamental conclusion of this school's protagonist is that financial inclusion comes after economic expansion. According to the third school, economic growth and financial development mutually support one another. This was the finding of scholars like Granger (1988).

Furthermore, prior research has demonstrated that increasing credit flows to agricultural value chains positively affects the generation of wealth and jobs (Nwanne, 2015; Omorogbe et al., 2014; Ayodele et al., 2013; Okafor, 2012; Bruhn & Inessa, 2009). All of these high points led to the development of the following theories, which will direct future research: -

Research Hypothesis

Hypothesis 1

Financial inclusion hypothesis

This study posits a statistically significant correlation between financial inclusion and economic growth in Nigeria. This will be measured by access to and usage of agricultural credits and economic growth. Ho: $B=0$ (No significant association exist between Financial Inclusion and economic growth); H1: $B>0$ (Financial inclusion have a positive and significant impact between on economic growth).

Hypothesis 2

Agricultural Credit Hypothesis

Agricultural credit provided by the Bank of Agriculture (BOA) significantly impacts economic growth in Nigeria. Ho: $B = 0$, (Agricultural credits have no significant association with economic growth; $B > 0$; (Agricultural credits have a significant association with economic growth.

Hypothesis 3

Granger Causation Hypothesis:

The Granger causality test is based on the following null and Alternate hypotheses:

Null Hypothesis (Ho): Financial inclusion does not Granger-cause economic growth, meaning past values of FI do not help predict economic growth; and

Alternative Hypothesis (H_1): Financial Inclusion Granger-cause economic growth. In this case, past values of financial inclusion do help predict economic growth.

CHAPTER 2: LITERATURE

Preamble

This chapter examines the main findings from actual research about the effects of expanding agricultural lending to farmers on promoting financial inclusion and the growth and development of Nigeria's economy, with particular reference to the Bank of Agriculture (BOA) in that country. Agricultural Development Banks (ADB) provide the required stimulation for the growth of rural economies (Chiriak et al., 2020; Seibel, 2000). As a result, it is projected that BOA activities will be well-regulated to boost agriculture financing and enable the necessary growth of the national economy. The research on the subject employed a range of data sets to identify the possible causes and effects of financial inclusion on economic performance.

It is essential to highlight the outcome of current studies that have investigated the connection between agricultural credit, financial inclusion, and economic growth. Evaluating the influence that some financial service providers' operations and activities have on economic growth is crucial. This is necessary because our study focuses on their actions, intersecting the two strings connecting financial inclusion to economic progress. The data was collected from respondents, including families and enterprises with macroeconomic financial inclusion indicators (Beck et al., 2006). As an alternative, Butler and Cornaggia (2011) suggested gathering and utilising data to aggregate financial growth information by compiling such statistics at the firm level by country. Thirdly, several studies use data from companies but focus on a few chosen criteria that show how simple it is to access and use credit facilities in the financial markets (Fowowe, 2017; Aterido et al., 2011).

For the objectives of our study, the first category of research data is sufficient since it may be utilised to refer to significant findings from the previously described second and third groups of researchers. Financial inclusion is still a significant policy problem despite recent advances in research due to its correlation with economic performance (Demirguc-Kunt et al., 2017). This study provides an overview of agricultural loans' benefits, the direct and indirect transmission mechanisms that connect them to financial inclusion, and economic growth. Although other ideas have been employed in past studies, three main theories stand out. These include asymmetric information theory, current theories of modern development, and want-based free-market methods. The finance-led growth hypothesis was chosen for this study because, in addition to its ability to accept some aspects of the other principles, it is resilient and capable of analysing the complex socio-economic features of the modern world.

The primary sources utilised to gather secondary statistics for this research include prospectuses from World Development Indicators (WDI), Central Bank of Nigeria (CBN), Nigerian Bureau of Statistics (NBS), and the apex Agricultural Development Bank in Nigeria, Bank of Agriculture (BOA). Others include the Statement of Accounts, the Annual Report, and the CBN Statistical Bulletin. The analysis employed in the study was the ARDL co-integration approach. By calculating the percentage that a disequilibrium may be addressed using the error correction model (ECM) of ARDL specification, while also examining long-run interdependencies among the variables, the co-integration technique is used to determine the short-run dynamic.

Conceptual Framework

Background and Paradigm of Financial Inclusion

The term "financial inclusion" can be interpreted in various ways. An analysis of the literature reveals no universally recognised definition of financial inclusion. Different nations

place varying amounts of emphasis on financial inclusion, depending on their current state of social, economic, and financial growth and their most pressing societal challenges. According to Onaolapo (2015), financial inclusion ensures that the formal financial system is easily accessible to and used by every economy member. Mohan (2016) states that timely and reasonably priced financial services delivery to the impoverished and low-income segments of society are also used in defining and understanding the word. According to the Centre for Financial Inclusion (CFI, 2015), financial inclusion is the state in which all individuals who can access financial services have access to a comprehensive array of high-quality services that are provided at fair prices, conveniently, and with consideration for the clients. Often referred simply as access to and use of financial services, financial inclusion means availability of appropriate financial goods and services. Nonetheless, it is a benchmark for gauging how many of the general population may access financial services.

The World Bank (2016) asserts that financial inclusion and access to financing are two distinct ideas. However, access to financial services is not always implied by not utilising them. While financial services are widely available and reasonably priced, many people choose not to use them for ethical or other reasons. However, because of exorbitant costs, certain people could only have limited access to these services or be subject to governmental limitations. Therefore, the extent to which a lack of inclusion stems from a lack of demand or obstacles keeps individuals and businesses from accessing financial services. According to the report, offering affordable banking (formal financial) services to marginalised groups within society is referred to as financial inclusion or inclusive financing. Another World Bank report in 2015, stated that financial inclusion is the availability of affordable, practical financial goods and services that satisfy consumers' requirements in credit, insurance, savings, transactions, and payments. Agreeing with above

assertions, Demirguc-Kunt, Klapper, Singer, Ansar, and Hess,2018; went further to say that financial institutions as important intermediaries in this connections, facilitate transactions by acting as economically sensible, cost-effective agents, providing customer-friendly services at fair considerations. They also take into account fast actual consumer access to financial services, to banking services all economically active agents who hitherto have no access to formal financial services. All financial inclusion endeavours are therefore, intended get such persons included in the current financial architecture. Ultimately, the results would boost economic activity and increase investment levels by integrating resources from the surplus and deficit economic sectors.

Financial inclusion entails expanding access to and utilisation of formal financial services while reducing unintentional obstacles that those who do not utilise the formal financial system perceive as such. This category includes financial institutions that provide credit, insurance, payment, and risk management services to individuals with various requirements (Clamara et al., 2014). A plethora of research has established a link between financial inclusion and economic growth, revealing that unequal income and asset possibilities significantly impede the development of many community-based firms (Wilkinson & Pickett, 2007). According to the World Bank (2005), inequality has hindered the development of strong institutions in society and resulted in the underutilisation of resources and poor resource allocation. The primary objective of the Financial Inclusion initiative is to mitigate these unwanted occurrences from worsening. This journey has already been substantially completed in almost every country, especially in developing and impoverished countries of the world. The best way to combat poverty and advance social justice would be to provide more hospitable access conditions for formal financial services and products. It has been established that access to and use of financial services is essential to improving impoverished person's access to banking services. Inclusive Finance, is viewed as a

potent tool that might help raise the living standards of the impoverished and reduce the disparity in low-income inequality (CGAP, 2020; Park & Mercado, 2018; Fadun, 2014).

There are significant differences in the conception and application of the idea of financial inclusion (Fadun, 2014; Ford & Rowlingson, 1996). Many authors claim that having access to risk assets and facilities such as credit, deposit and transfer services, insurance, pensions, guarantee funds, etc., improves lives in ways other than monetary exchanges. Financial inclusion facilitates the growth of certain businesses and societies (World Bank Group, 2018; Gitaharie et al., 2018; Shirazi et al., 2018; Walker & Zhu, 2018; Smyzcek & Matysiewicz, 2014). Financial services are important in eradicating poverty, guaranteeing food security to end hunger and suffering and encouraging endless agricultural production, protecting the health and welfare of citizens, and empowering women in all walks of life. Eight of the seventeen Millennium Growth Goals have been recognised in the study as facilitators of the growth of financial services. The International Labour Organisation (ILO), which has long recognised the significant role that banks and other financial institutions play in society, has likewise adopted this stance. Consequently, it has increased its promotion and lobbying for financial services that are universally available to all individuals and organisations as an indication of social security. The ILO believes that any effort made to lessen humankind's vulnerability to poverty and suffering is a fight worth fighting (Bhandari, 2018).

Similarly, various countries have developed distinctive programmes to improve the quality of life of their citizens. Over 55 countries have pledged to promote financial inclusion since 2010, and over 60 have begun or are implementing national programmes with varying degrees of success (Kumar, 2017). Considering how highly valued financial inclusion is across the world, the World

Bank Group (2018) has established challenging goals and targets to achieve universal access to financial resources by 2020.

Defining Financial Inclusion

Financial inclusion, as defined in the early 2000s, is providing financial services to those who are "non-banked" or "non-bankable" (DFS, 2017). The concept has evolved over the last ten years and has presented four distinct features: financial services are easily accessible to everyone, including individuals and small businesses; supervisors, officials, and financial service providers share commercial, administrative tasks and management; and the regulatory and supervisory functions promote sustainability for all players in the finance industry. The last facet of financial inclusion is the competition among financial service providers. As a result, different interest groups now provide different interpretations to the term "financial inclusion." The interpretation of the phrase is contingent upon various factors, such as the extent of social, economic, and fiscal emancipation of the populace, the composition of the financial sector's stakeholders, the features of communities that are economically excluded, and the degree to which the monetary authorities are aware of the magnitude of the difficulties they face. These reasons cause the word's philosophy to differ based on the nation and the area it refers to (Ananwude et al., 2018). That being said, the concept of financial inclusion clarifies the three basic groups. The first category consists various definitions found in literature that were based on the extent, purpose, and perceived magnitude of financial exclusion. The biggest of them all, the spread, often referred to as the breadth dimension, is thought to operate as a barrier that keeps the underprivileged and other socially marginalized groups from having access to the financial system and the associated products and services (Sinclair & Stephen, 2001). Some claim there is a connection between financial and social

isolation. Conversely, the focal dimension is located at the middle of the range. It is said to have something to do with being shut out of the financial system and other exclusive difficulties that specific demographic groups face when attempting to receive standard financial services.

Second, there are meanings that emerge from different challenges and complexities related to word meanings, usage, and accessibility (Ozilli, 2018; Sujlana & Kiran, 2018; Kumar, 2017; Akhil, 2016; Onaolapo, 2015; World Bank, 2014; Reserve Bank of India, 2008; Beck & Demirguc-Kunt, 2006; Chant Link & Associates, 2004; Asian Development Bank, 2000; Cihak et al., 2020; Stephen, 2001). These scholars choose to tackle the subject from an accessibility standpoint. They observed that the absence of financial inclusion pushes the unbanked into the unofficial banking sector, characterized by high interest rates, little capitalisation, and, as a result, insufficient support for businesses and merchants. Thirdly, some studies have taken a different tack, emphasising the importance of economic activities within the framework and general parameters of inclusive enrichment (Zulkuhribri & Ghazal, 2017; FAO, 2017). From this vantage point, scholars view the business as a meticulously designed course of action and process for resolving problems such as suffering, poverty, inequality, and the UNDP's Sustainable Development Goals (SDGs). Furthermore, Abbas and Atanda (2019) asserted that phraseology's influence on academic acceptance results from its critical function in growth endeavours in all countries. As more individuals attain financial inclusion and integration into the formal financial system, structures and procedures are adapted to facilitate adequate planning and decision-making. Based on all of the foregoing theories, the organisations, bodies, institutions, and other interest groups created the following fundamental definitions.

On their part, the Reserve Bank of India, India's Central Bank, in 2008, chose to characterise financial inclusion as "the process of ensuring access to financial services, timely and

adequate credit for vulnerable groups, such as weaker sections and low-income groups at an affordable cost”.

The Nigeria's Financial Inclusion Strategy (NFIS, 2018) document corroborates this theory. It defines financial inclusion as granting all adult Nigerians ready availability of a broad range of traditional banking products and services and ensuring that those resources meet their needs at reasonable costs.

The Development Bank of Asia in 2000 viewed financial inclusion from the social perspective. While agreeing that concept entails the provision of a wide range of financial services to the poor, vulnerable, and low-income households and their micro-enterprises, the bank went further to enlist a number of products and services which Financial Institutions must parade. The include deposits, loans, payment services, money transfers, and insurance covers.

According to Chant Link and Associates, Australia, financial exclusion is the incapacity of certain clients to obtain sufficient, reasonably priced, safe, and equitable financial products and services from reputable providers (2004). They observed that financial exclusion becomes a concern in society when it impacts customers with lower incomes or those experiencing financial troubles. The terminology embodies the existence of a comprehensive financial services reach, which implies the absence of all barriers, including payment and non-payment barriers in the use of financial services. As a result of the many perspectives which financial inclusion can be viewed, it has been very challenging to measure.

Financial inclusion, according to UNCTAD (2021) is a term used to describe a financial system that provides credit, savings, and payment services to all bankable individuals and enterprises. Although inclusive finance does not require anybody who is eligible to use the services to do so, they should have the opportunity to make that choice on their own. This should be the

norm in all municipalities, townships, and communities where the majority are low-income workers, underprivileged home enterprises, and microbusinesses.

The Centre of Financial Inclusion (CFI, 2013), conceived financial inclusion as the act of providing and distribution of financial resources, and privileges of a consistent quality. They argue that the facilities have a major role in the growth of economies. In addition, they characterise financial inclusion as the state in which all consumers of economic services have seamless access to a comprehensive bogue of excellent bank products and services, provided in an approachable manner, at a reasonable cost, and with consideration for each and every one of them. Therefore, improving and stabilising everyone's financial condition is crucial to ensuring financial inclusion and ongoing progress. Financial inclusion thereby facilitates the creation of financial products that are especially tailored to the requirements and aspirations of low-income families, as well as the accessibility and utilisation of a variety of financial goods. It also encourages the development of affordable and easily accessible financial services for the great majority of the poorest of the poor (Fouejieu et al., 2020; Abbas & Atand, 2019). Long-term investable wealth is produced by mobilising and using these resources (Kama and Adigun, 2013).

Thus, another facet of financial inclusion is merging the formal and informal financial networks into recently established financial institutions better equipped to satisfy business needs. In most countries that have not fully embraced financial inclusion, funds are migrating into the unofficial sector due to systems that inadvertently allow for informal trading operations. This adversely affects society and specific firms (Kazeem, 2017; Gazdar & Cherif, 2014).

Nwafor and Yomi (2018) assert that while low- and middle-class individuals comprise the bulk of the population, they also own a disproportionate number of the businesses and capital in the economy. They argue that investors may obtain a sizable quantity of reasonably priced long-

term investible capital by utilising and mobilising these resources. Quantifying financial inclusion is more challenging due to the wide range of ideas and perspectives. Prior to the World Bank (2018), the phraseology "financial inclusion" was implemented with an emphasis on proprietorship and access, mainly limiting the goods and services offered by the major financial service providers (Makoto, Tryphosa, 2025; Beck, Demirguc-Kunt, Levine, 2013; Demirguc-Kunt, 2006; Meadows, Randers, Meadows., 2004).

Examples of these financial services encompass a range of offerings, including various account operations, several credit options of different features, property insurance, and money transfers (Bridgeman, 1999). These requirements also stem from underlying policy concerns, such as the fact that many people, particularly those with low incomes, underserved by basic financial infrastructure, like checking accounts and low-interest loans, placing an additional financial burden on those who are already the most vulnerable (Treasury, 2004).

Research shows that financial inclusion is linked to improved women's empowerment, driving increased expansion of the economy, and savings (CGAP, 2019; Shakhovskoy et al., 2019; Ashraf et al. 2010). Consequently, any attempt to curb easy access to financial services, will lead to poverty, inequality, and ultimately a suppression of economic progress and prosperity (Ndlovu & Toerien, 2020; El-Zoghbi & Hess, 2016).

Higher levels of asset ownership and economic empowerment can result from having access to a structured financial system (UNCTAD, 2014). Thus, valued financial instruments such as a bank account at an accredited financial institution are essential because they provide a safe haven for savings and a reliable means of making payments to loved ones, employers, or the government. It also provides channels for government funding, which is necessary for investing in a company or business initiative (Beck, Demirguc-Kunt, Levine, 2013). Other studies conducted

by Demirguc-kunt, Hu, and Klapper, 2020; Fouejieu, Sahay, Cihak, and Chen, 2020; Koomson, Villano, and Hadley, 2020; Dri & Kakinaka, 2020; Omar & Inaba, 2020; Mushtaq & Bruneau, 2019; have all demonstrated the positive impact that available funding play for the impoverished.

Financial inclusion is crucial for development, but putting it into practice is difficult due to a number of constraints (Allen, Demirguc-Kunt, Klapper, & Martinez, 2016). Fixed transaction pricing and annual fees usually make little transactions too costly for a large segment of the population to pay. The annual costs of running a current account in Sierra Leone are equivalent to 27% of the GDP (gross domestic product) per person in the nation, according to Allen, Demirguc-Kunt, Klapper, & Martinez, (2016). They assert that this might be the reason why more than 44% of non-account holders in that country do not yet have a formal account. However, fixed fees and high account creation and maintenance costs may also indicate a shaky institutional or physical infrastructure as well as a poor market. This is accurate in many rising economies. The requirement for documentation is another element influencing the dearth of formal accounts among adults in underdeveloped countries such as Nigeria and Sierra Leone (Allen, Demirguc-Kunt, Klapper, & Martinez, 2016). If eligibility is limited, workers in the unorganised or rural sectors, who are less likely to have legal documentation of domicile, such pay stubs, may be left out. A reasonable limit to the degree to which documentation requirements can be relaxed exists; this limit varies throughout nations because of legitimate concerns about money laundering and fraud. Documentation is more likely to be an obstacle in countries where the proportion of foreign-owned banks is higher than that of government-owned banks. This demonstrates how those who are financially marginalised might think that documentation requirements for foreign (government) institutions are more stringent. In his investigation, Sarma (2008) identified three fundamental three key dimensions of financial services.

The first dimension is bank penetration. Penetration is measured in terms of deposit accounts count, and credit accounts per 1,000 people. Access to financial services, or availability, is the second dimension. It is calculated using the following metrics: ATMs for every 1,000 km, ATMs for every 1,000 adults, and bank branches for every 1,000 every kilometer. Usage is the third dimension, and it is quantified as outstanding deposits, measured as a share of National income and credit as a share of GDP.

These three dimensions and variables have been used extensively in a number of research in assessing financial inclusion (Olaniyi, 2017; Sharma, 2016; Kodan & Chhikara, 2013). The issue is that measuring financial inclusion would only be reasonably easy if formal financial services were able to quantify these elements. The goal of this study is to comprehend how Nigeria's Bank of Agriculture's agricultural loans affect financial inclusion and the trajectory of the country's economic growth. The emphasis is on financial inclusion, as previously stated by orthodox account holders (David West, Ajai, Umukoro, Salami, Kelikume, & Ihenachor, 2017; Allen, Demirguc-Kunt, Klapper, & Martinez, 2016), explored how digital technology was used in Nigeria. They found that, in contrast to the 40.8% financial inclusion rate, just 48.6% of the nation's population had a bank account.

A well-developed financial system increases economic activity and promotes economic growth by lowering costs and improving access to capital. The results of empirical studies that look at the connection between the development of financial systems and economic growth indicate that developed financial systems aim to increase the amount of financial resources accessible to economic actors while boosting business activity.

An economy's financial inclusivity is often measured by the amount of loans and deposits taken out by small and medium-sized firms and low-income families, as well as by the percentage

of the population that is serviced by bank branches and ATMs. In addition, findings have highlighted a positive correlation between financial inclusion and Nigeria's economic performance (Olaniyi, 2017; Nwanne, 2015).

This study used co-integration and Granger causality analyses to support this claim about how The Bank of Agriculture (BoA) loan programme is used in Nigeria as a means of increasing financial access and stimulating the country's economy. Notwithstanding the significance of financial inclusion in the advancement of efficiency and equality in society, it is acknowledged that a large number of Nigerians are excluded from mainstream financial services and are not banked (NFIS, 2012).

According to the EFINA, (2019) 39.5 million individuals, or 39.6% of the adult population, were economically excluded. According to the same study, 36.6 million individuals, or 36.8% of the population, had a bank account. As a consequence, billions of Naira are exchanged in the unofficial sector, which is bad for the country's economic growth. 14.6 million People saved money at home in 2018, according to DFS figures (EFINA). If each of these individuals consistently saved N2, 000 with a bank, 50.0% of them may contribute up to N175.2 billion a year to the official financial system. Recognising the potential inherent in the interdependency between finance and economic growth, the Nigerian government joined other nations in the struggle for greater financial inclusion in the national development plan. The Nigerian government has an ambitious plan to provide universal financial access by 2020, and among the steps the Central Bank of Nigeria has taken to that end are the establishment of the Micro, Small, Medium Enterprises Development (MSMED) Fund, tiered Know-Your-Customer standards, linkage banking, and credit-enhancement programmes like the Agricultural Credit Guarantee Scheme (ACGS), Commercial Agricultural Credit Scheme (CACCS), Entrepreneurship Development

Centers (EDCs), and Nigeria Incentive-Based Risk Sharing. Improved financial coverage requires government support (Naceur, Barajas, and Mascara, 2015; Fadun, 2014; Barajas, Chami, and Yousefi, 2013). This considers the possible cost of missed economic growth if a country's financial service volume is insufficient to meet the needs of the vast majority of its citizens, particularly the economic agents.

Determinants of Financial Access

Financial inclusion is a significant economic problem for wealthy and poor countries and multilateral financial institutions such as the World Bank and IMF (Beck, 2016). Global economy should be the primary focus of international policy due to its capacity to eradicate poverty, unemployment, and income disparity. However, the substantial barrier to utilising and gaining access to formal financial services disproportionately affects developing countries (Nirvikar, 2017). According to studies on financial inclusion in developing countries, most adults and companies use formal financial services. This was caused by several problems, such as costly account creation and maintenance fees, poor infrastructure, low income, a lack of awareness regarding the benefits of formal financial products, and stringent legal frameworks (Ammar & Azhar, 2016). This section concentrates on the elements that affect financial inclusion in developing countries in light of the previously mentioned background.

A comparative examinations of variables influencing inclusive finance in developing countries, specifically, Eurasia region and Europe was conducted by Demirguc-kunt, Hu, and Klapper, 2019. Even though both regions have inclusive financial systems that encourage people to invest for the future in terms of health, education, retirement savings, business opportunity capitalisation, and the capacity to withstand financial shocks, there are contrasts in the intensity of

financial service provision between the two regions. They said that most people in developing Europe had accounts and that opening an account was the first step toward using a formal financial system. Consequently, the developing countries in the area saw an increase in financial inclusion from 45% in 2011 to 65%.

The survey also said that despite their extremely low starting points, Georgia, Kyrgyzstan, Armenia, Moldavia, and Tajikistan were among the countries with the most significant increases globally (Demirguc-kunt et al., 2019). Furthermore, the results demonstrated that in some countries, there were notable disparities in account ownership across gender and wealth. For example, Turkey has a gender discrepancy of about 30%, three times larger than the average gap in developing countries. Nonetheless, the difference in wealth between the wealthiest 60% and the poorest 40% of Romanians was 33%, more than twice as high as the average gap across developing countries. There were many strategies available to improve account ownership. Over 80% of individuals without bank accounts own a smartphone. Consequently, public sector pension transfers to accounts reduced up to 20 million persons lacking bank accounts; 8 million of such reductions happened in the Russian Federation alone. Generally speaking, the region's variety offered several opportunities for nations to share knowledge with one another. This presented a comprehensive and forward-thinking organisational and research plan. Similarly, Elsayed and Elatroush (2019) investigated the crucial elements influencing financial inclusion in emerging nations using a case study of 21 middle-income nations. A range of factors were incorporated into the financial inclusion measurements. Additionally, a set of variables was used to ascertain the factors influencing financial inclusion in the communities of the designated group of middle-income nations.

Additional metrics leveraged to proxy access to and use of financial services were percentage of deposits accepted by financial institutions, ratio of Cash Machines per adult population (1:1000), banking infrastructure count (branch outlets for every 100,000 individuals), and active bank account ownership for every 1,000 persons. However, additional socio-economic indices of financial institutions included the dispersion of interest rates, inflation, GDP growth per capita, unemployment rate, rural population, GINI index, political stability, and the capacity to combat corruption. The study employed cross-sectional, two-stage minimum square and principal component techniques to evaluate the key variables that affected financial inclusion in 2017. The results showed that the sample nations' initiatives to fight corruption increased the opening of new bank accounts and ATM usage. The study also showed that, for the rural population, borrowing to launch, maintain, or grow a company had a negative impact on both variables. The margin was just in favour of ATM availability across the country. As a result, the greater the population of rural areas, the lower the deposits in financial institutions and the capital needed to start a business. The study recommended that governments implement various measures to improve access to and use banking infrastructure, especially, in rural areas.

Ong'eta (2019) argued that financial inclusion was the secret to a country's economic prosperity. Financial accessibility allowed everyone to participate in inclusive growth, which is how this happened. Therefore, financial development requires financial inclusion. The report identified the elements that impact financial inclusion. Previous research on the subject of "What are the determinants of financial inclusion?" provided the framework for this investigation. In addition, the study was a peer-reviewed publication of previous financial inclusion research. In addition, scholarly journal research publications were examined to determine the factors influencing financial inclusion. The study discovered that supply and demand-related factors

affected financial inclusion. Age, gender, savings, education, collateral, employment guarantee programmes, income disparity, and individual or household income were among the variables linked to demand.

Conversely, high rates (accessible credit), innovation (agent banking and mobile banking), ICT, banking branches, familiarity with financial products, money management counselling, and debt management are supply-related characteristics that affect financial inclusion. The other factors were urbanisation and an enabling environment. The research concluded that financial inclusion is essential to economic progress, so government policies should be enhanced to support it. Therefore, to positively promote financial inclusion, it is crucial to address supply- and demand-related challenges and explicitly combine these factors.

Data and Singh (2019) investigated financial inclusion between 2011 and 2014 in many developing and emerging countries. The study focused on developing the financial inclusion index and examined its relationship to the HDI's worth. It offered an explanation for the financial inclusion index's observed fluctuations. The key component approach was used to measure the availability, access, and usage three-dimensional indices as a compliment to the access to empowerment index. Another method used to characterize the variables impacting global financial inclusion was a pooled OLS with clustered standard error regression. However, Ngoma (2019) said that because financial inclusion may accelerate economic development and lower poverty and inequality, it has gained traction in policy circles and academic research in developing countries. This study used the conditional logit model to provide evidence on the variables influencing financial inclusion in Zimbabwe. The results indicated that a number of characteristics, including age, gender, income, and work status, influenced financial inclusion in Zimbabwe. The bulk of individuals are still unbanked due to the trust that is placed in financial institutions. To bridge any

gaps detected in a country, it is imperative to develop an inclusive financial system. Effective measures also helped to increase people's confidence in Zimbabwean banking institutions.

Lei, Dang, Nguyen, Vu, and Tran, (2019) employed the Random Effects Model (REM) to investigate the primary determinants of financial inclusion in 20 Asian countries utilizing panel data collected between 2011 and 2016. Universal inclusive finance, facilitated through equal access to and use of a full spectrum of financial products, directly supports eradication of poverty, development of skills, and the assurance of long-term financial viability, all of which benefits seven of the seventeen sustainable development targets. The results demonstrated that a person's index of financial inclusion was much higher for individuals with more money, resources, and chances to use financial services. Second, more knowledge leads to greater financial inclusion as better educated individuals are more aware of the trade-offs and implications associated with investment services and institutions. Financial items would therefore be used more wisely. Third, the financial inclusion index was harmed by the unemployment rate. Fourth, prior studies found that the correlations between population size, inflation, interest rates on deposits and networks, and financial inclusion were only weakly significant. According to Allen, Demirguc-Kunt, Klapper, & Martinez, (2016), the Research community and professional's interest consists in the importance of inclusive finance. Development partners have thus been keeping an eye on the conversation, including the AfDB, G20, Multilateral financial institutions such as World Bank, and the International Monetary Fund. Zimbabwean government demanded a national plan for financial inclusion based on trends in worldwide account holdings. As a result, the research determined the factors affecting financial inclusion in Zimbabwe. The study comes to the conclusion that there is a favorable correlation between financial inclusion and internet connection, employment, age, education, and financial literacy. The distance to the nearest point of access and

the necessary bank account information, however, were negatively correlated with financial inclusion. According to the paper, the government should enact laws that incentivize financial service companies to grow their businesses in close proximity to the general population or ensure that they employ technology that makes financial services more accessible, like agency and mobile banking. Using data gathered from 120 countries, Bozkurt et al., (2018) investigated the factors that led to increases in the rates of financial inclusion between 2011 and 2014. After constructing the index of access to financial services across sampled nations, using local and global spatial association research approaches to explore for evidence of geographical linkages. Spatial panel data models and spatial regression were then employed in the study to monitor geographical dependence. The findings indicated that social, banking, and political issues exerted a s access to and use of banking services. The convergence analysis's conclusions have political implications for how to reduce the differences in financial inclusion amongst the countries. Additionally, cross-national convergence in financial inclusion was found by the study. Akileng et al. (2018) examined the determinants of social finance in Uganda. The study concentrated on the ways that financial innovation and financial literacy support the financial inclusion of Ugandan families. According to the survey, a significant proportion of the populace in Uganda's rural and urban areas remains uninsured by government financial systems. Because of this, a sectional research technique was adopted in the article's investigation of this topic in Uganda. The research sample comprised adults living in both rural and urban parts of Uganda. Techniques for regression analysis and correlation were applied to the study's empirical data.

The results showed that among Ugandan families, financial innovation and financial literacy were more reliable indicators of financial inclusion. Financially literate households were better able to make sense of the new financial goods and services technology accessible to them.

They asserted that this research is the first of its kind to look at the importance of the elements that the Central Bank of Uganda suggests for financial inclusion. However, David et al. (2018) examined the variables influencing financial inclusion in Nigeria using information from a time series from 1990 to 2016. They used the Unit root test and co-integration test.

The predicted result showed positive relationships among the recommended factors and access to inclusive finance. Therefore, a country's GDP per capita and financial inclusions are adversely associated. Despite the continuous expansion in the flow of money throughout the nation, financial inclusion has undoubtedly grown. Credit and internet usage for every 1000 persons are significantly and positively influenced by financial inclusion. On the contrary, tremendous internet access had a major impact on access to inclusive finance. Consequently, more financial inclusion will arise from the expansion of financial services to a larger population residing in rural regions without heavy internet usage. Additionally, transaction costs have been significantly reduced by the use of cellphones, ATMs, and the internet. Additionally, it greatly simplified the process of providing home banking services in cases when the transactions were carried out by uninformed people using mobile phones, increasing the nation's capacity for credit processing in rural regions.

A 2017 study investigated the variables impacting financial inclusion across nations by measuring, analyzing the geographic effect, and analyzing the contributing components of the study countries. In an effort to evaluate the extend of inclusive finance in various nations, researchers employed the Findex Database, a World Bank initiative. The findings revealed a distribution of regional spatial accumulation whereby most low- and middle-income countries were observed to have lower access to banking services than those of developed nations in North America and Europe. They stated that their geographic study validated their hypothesis and

illustrated the cross-national effects of dependence and aggregation. The study employed a spatial econometric analysis to characterize some traits that were substantially correlated with financial inclusion. The results demonstrated that an individual's income, level of education, and use of technology and communication devices all had a substantial impact on the extent to which banking services was availed and used. Conversely, the health of the banking sector and financial stability were significant variables. According to the report, in order to achieve the Millennium Development Goals, the majority of nations must set up an equitable financial system. Finance has long been seen to be one of the main drivers of vital parameter increase (Goel & Sharma, 2017). A country's economic growth may be furthered and participation by the weak and disadvantaged facilitated via financial inclusion. By connecting the nation's contribution to the mainline from the impoverished and vulnerable people, a developing nation such as India might achieve inclusive growth through the use of the financial inclusion mechanism. The impoverished and disadvantaged will have easier access to a country's financial system, which would spur better economic growth. Several studies on financial inclusion are lacking one or more variables, according to the study. However, evaluation of the more stringent financial inclusion index is essential for every indicator. This article created an index that provided a comprehensive overview of India based on financial inclusion. Three criteria were used to assess the index to ascertain the extent of financial product use and access (high financial inclusion, medium financial inclusion, and low financial inclusion). Consequently, the study reveals that a year's financial inclusion index score was deemed high if it fell between 0.6 and 1.0 between 2004 and 2015. On the other hand, it is further classified as a low index if it is between the range of 0.4 and 0.6 for the medium index. The ultimate conclusion of the study was that each and every indicator was essential to the advancement of financial inclusion.

International Monetary Fund (2016) report said that 45% of Bangladesh were not able to access formal financial services (Uddin et al., 2017). As a result, attempts by joint government and the World Bank to achieve universal access to finance had been impeded by a number of major barriers, including as high interest rates, large rural populations, and low literacy rates. They said that research has demonstrated that legislators fail to consider a plethora of other aspects, which undermines their ability to formulate effective regulations. The Broad economic and micro-level variables that impact the reach of financial services were categorized by research. Econometric method used in the study was to identify the combination of factors that most significantly impact a country's uptake of banking services. Data was examined leveraging both static and dynamic panel models, incorporating random effects, and the generalized methods of moments (GMM) estimation approach. Next, data from 25 banks operating in Bangladesh between 2005 and 2014-18 traditional banks and 7 Islamic banks - was used to analyze the state of both traditional and Islamic banks in terms of access to and use of banking services. Moreover, the analysis also used regression analysis across quartiles technique to ensure robustness. It was found that a bank's supply-side interest rate, effectiveness, and size all had a significant effect on financial inclusion. However, the literacy rate was good and the ratio of age dependency was adversely correlated with financial inclusion and demand. Quantile regression modelling revealed that the quantum of money deposited, borrowed, and advanced was significantly influenced by the bank's size. The findings might be helpful to government officials and bank regulators in improving their policy choices and guaranteeing a more sustainable financial system. The findings showed that the excluded population was encouraged to utilize official financial services by enhancing branch services and establishing interest rates on loans that were comparable to international norms. The study's conclusion made the case that emerging countries with rising levels of human capital also

became more involved in the financial industry, to support growth and developments of economies.

According to Oyelami, Saibu, & Adekunle, 2017; exclusion of a sizable segment of the population is a major barrier to sustainable growth and development in the developing world, particularly in Africa. The Vector Panel Autoregressive (PVAR) with Distributed Lag) was used in the study to analyse variables influencing availability, and usage of banking services in Africa south of the Sahara. Research outcomes demonstrated that availability and usage of banking services in the regions was highly impacted by both supply-side (interest rate and ATM usage as a proxy for bank innovation) and demand-side (income level and literacy) variables. The research recommended the sub-regional governments to create legislation that support financial literacy and other innovative financial services in their various countries to help strengthen financial systems for inclusive growth in the sub-region.

Ajide (2017) investigated the variables influencing financial inclusion based on the function of financial institutions in a panel of 18 SSA countries leveraging Generalized Instrument Variables (GIV), also referred to as Generalised Methods of the Moment (GMME). The GDP per capita, inflation, bank concentration, and other macroeconomic factors under control were among the key macroeconomic parameters that consistently underscored the significance of financial institutions as driving forces behind financial inclusion in the results. The article's conclusion stressed how important it is to employ many governance indicator elements in addition to a composite governance index, rather than relying only on them, to inform policy decisions because each of them yields a different set of policy results.

Zins and Weill (2016) studied the key factors that influence financial inclusion in African countries using data from 37 countries. Information was extracted from World Bank's Global

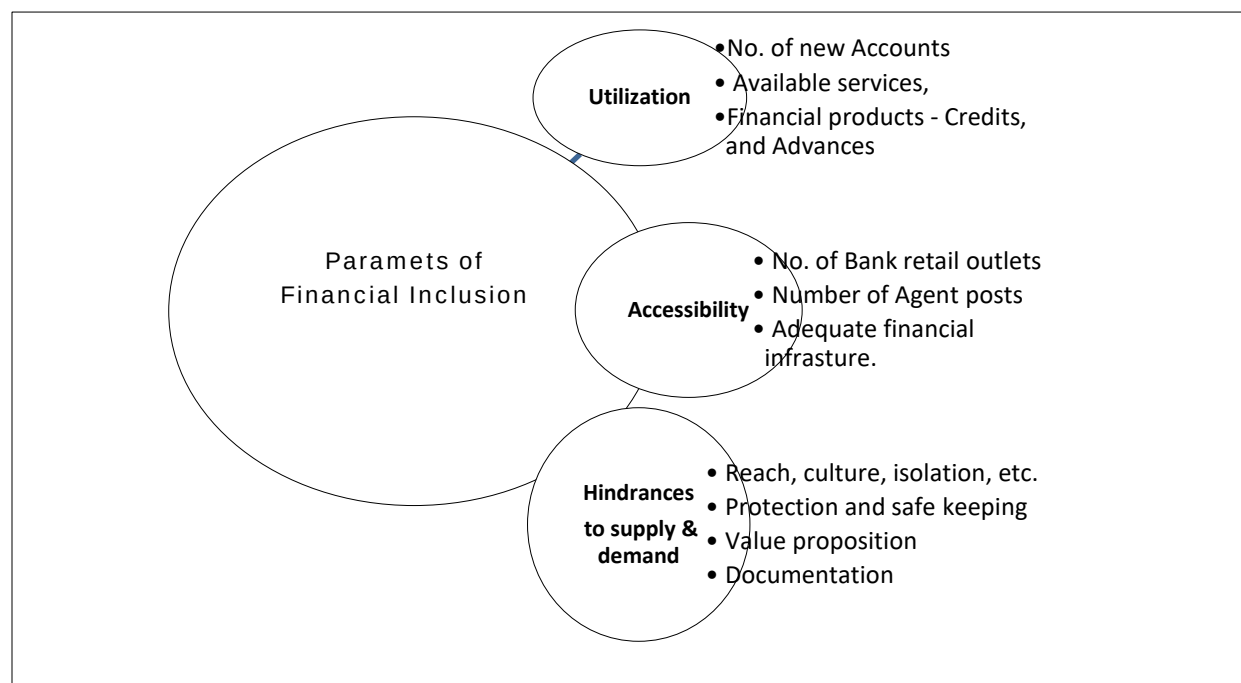
Financial inclusion index and compared to some common profit estimation techniques. Scholarly analysis observed that financial inclusion was supported by greater income, being a man, wealth, and education levels. They maintained that mobile banking was impacted by the same variables that affected traditional banking. Furthermore, distinctions were observed between the financial determinants that are informal and formal. Consequently, the results of the study were applied to develop financial inclusion strategies for African countries. Franklin et al., (2016) assessed financial inclusion in terms of account ownership and utilization. The study demonstrated the many ways in which financial inclusion may help people and countries alike. They did, however, claim that little is known about the underlying cause of the easier lending availability. The study also examined the traits of persons and countries associated with successful policies and financial inclusion among the most vulnerable impoverished, rural, female, or youth populations. The paper states that more financial inclusion is facilitated by better legal safeguards, easier access to financial institutions, more affordable account fees, and environmental sustainability. However, the study presented evidence that human attributes influenced the effectiveness of inclusion activities. Tuesta, Sorensen, Haring, & Camara, (2015) investigated the characteristics of access to and usage of bank services in Argentina alongside other Latin American countries. The essay explored three aspects of financial inclusion in Argentina from a microeconomic standpoint. The findings indicated that formal financial services were accessible through traditional channels including branches and ATMs, in contrast to neighboring nations. However, there was no strategy in place to drive the process. The results show that an individual's age, income, and educational attainment were significant determinants of their capacity to get financial services, including bank loans, credit and ATM cards, online transactions, and accounts. Lastly, people's comprehension of the many impediments to inadvertent exclusion varied according on their age and wealth.

Parameters of Financial Inclusions

The biggest demand-side harmonised dataset at the individual level, Global Findex (2011–2014) from the World Bank was utilised in the study to create the index. It offers a consistent set of metrics for assessing products integration purchase and usage by consumers over all economic sectors. Accordingly, the analysis gathered data from one hundred and fifty thousand randomly selected, representative of the entire selected countries in both 2011 and 2014. The data set also improves the accuracy and coherence of the research, which is another advantage. In addition, it is available to individuals rather than just households. An important information gap on financial inclusion is filled by this directory. We also made use of information obtained from the overall supply-side access data for the 2015 Financial Access Survey, as was conducted by the International Monetary Fund. This is an excellent source of supply-side statistics, including details on 189 nations that were out of balance between 2004 and 2015.

Figure 1.

Key Components of Inclusive Finance



Utilization

To measure access to, and use of financial services, an indicator has been created to capture individuals who utilize at least one banking product or service. This enables them to perform transactions, such as making payments, investing in treasuries, and storing digital currency. By aggregating data from various Findex surveys, the indicator assesses the proportion of respondents with a bank account, either solo or joint. Those with an account are deemed users of banking services, have verified accounts with financial institutions, and may qualify for bank-issued debit cards.

As a result, any individual who holds a verified digital money account, such as an e-wallet, with a bank, non-bank financial institution, or cooperative society, is considered to have a bank account. Therefore, assessing formal financial services consumption component is feasible by using data collected from Central Banks and National Statistical offices, for specific countries.

Studies conducted by David West, Ajai, Umukoro, Salami, Kelikume, & Ihenachor, 2017 for Nigeria, revealed that 2.77% of respondents in 2014 and 2.04% in 2011 did not own any of the aforementioned products, but they did receive payments for compensations, public support and unemployment benefits, Social security benefits, State Aids, and commodities, previously; they also used the same financial institutions account to pay for their tuition or utility bills, and or received payments for government transfers or wages into a card. These folks sometimes do not even realise they have bank accounts.

Hindrance

The perceived obstacles to financial inclusion that deter unbanked individuals from utilising formal financial services are indicative of the obstacles they face. This information offers

an additional viewpoint for assessing the level of financial inclusion as it contains information on the population that is financially excluded as well as their opinions about the reasons behind their exclusion. Financial exclusion can be categorized into two primary forms: mandatory exclusion, where individuals are forced out, and Voluntary exclusion, where individuals choose to opt out. Individuals face a decision to determine if it is worth participating in the formal financial sector. Considering utility functions and financial constraints financial decisions can be viewed as a behavioural phenomenon. One possibility is that some people exclude themselves because they do not require formal financial services, which might be due to cultural differences, budgetary constraints, or a lack of knowledge regarding the value of utilizing the services. The decision may be swayed by a lack of understanding about the role of financial services in managing risks, savings, and investing. Nevertheless, other defects in the market, such as insufficient product offerings or restricted access to financial services, can also lead to exclusion. The latter financial inclusion restrictions may be categorised as involuntary exclusion, which prevents individuals from satisfying their basic necessities. We only include data about barriers that, from the perspective of the unbanked, represent involuntary exclusion, such as distance, unavailability of required documentation, cost, and a lack of confidence in arbitration, and the legal system. On Global Findex questionnaire, people are asked to choose one or more reasons why they are without a checking account; when responding to the perceived barriers. Data collected by Global Findex revealed that, 16 and almost 20% of individuals lacking banking services, respectively, cite off-the-beaten-path as a deterrent to establishing an account in 2011 and 2014. This theory is particularly common in less developed countries with dispersed access points. The requirement for paperwork was cited by almost 20% of individuals lacking banking services in 2011 and 19% in 2014. We also categorised individuals as “banked” if they report not having a personal account,

someone in their household has one. This is because affordability is the second most important factor. They are regarded as the secondary market for banking services.

Accessibility

Availability of mainstream financial infrastructure is a measure of people's capacity to use them. However, easier access to financial does not always lead to greater inclusive financial system. There are diminishing returns on access; once a certain level is reached, additional improvements don't necessarily translate to proportional gains. While increasing the intense margin of usage could result in higher frequency in accessing banking services, this does not always result in an increase in the extensive margin, as measured by the proportion of active bank accounts. On the other hand, if financial services satisfy people's needs and current access levels are not sufficient to increase usability, then expanding access can enhance financial inclusion. Furthermore, because of increased fierce competition, charges for such services may increase as more financial institutions grant access, possibly surpassing the barrier.

Financial correspondents, often referred to as banking agents, are for-profit businesses that operate outside of banks and pose as suppliers of essential financial services in order to get access to the legal financial system. If the companies are physical enterprises with cash handling as their major role, they are scattered throughout several industries (e.g., pharmacies, grocery stores, gas stations, and postal services). In their most basic role, banking correspondents handle transaction services (cash handling and payments), which often evolve and translate into sales channels. The actual locations of formal financial institutions, such as building societies, credit unions, cooperatives, money market funds, Rural and agricultural banks, and commercial banks, are taken into account (Cameron, et al., 2015). They also consider other institutions that accept deposits,

such commercial banks and microfinance. The International Monetary Fund's Financial Access Survey (FAS), are financial service providers. They gather information on bank branches and ATMs. Data about banking agents is gathered by (Camara et al., 2015). Access is not enough on its own. FinTech improves formal financial services delivery to about 2 billion people (Camara et al., 2015).

Researchin by the Asia Foundation last year found that 1 in 10 individuals in developing countries with official accounts do not make any deposits or withdrawals in a give month, whereas developed economies see inactivity in only 2%. Having access is just the first step, the real challenge lies in encouraging active usage. When services are complicated, users may find it challenging to use them. Increasing financial literacy is the main objective of using financial services more frequently, especially among young people who can eventually make financially responsible decisions that will benefit society and themselves. The success and performance of the various techniques employed since 2012, when NFIS was fully officially launched, with key details outlined in Tables 1 and 2.

Table 1: Nigeria's Financial Inclusion Targets (2010 – 2020)

	Target	2010	2015	2020
% of total adult citizens	Payments	21.6%	53%	70%
	Saving deposits	24%	42%	60%
	Loans/advances	2%	26%	40%
	Indemnity	1%	21%	40%
	Pension premium	5%	22%	40%
Number per 100,000 adults	No. of Branches	6.8%	7.5%	7.6%
	MBA Branches	2.9%	4.5%	5.0%
	Cash points (ATM)	11.8%	42.8%	59.6%
	Money box (POS)	13.3%	42.6%	850.0%
	Mobile agents	0%	3162%	62.0%
	KYC ID	18%	59%	100.0%

Source: Adapted from CBN Bullet, 2012

Financial inclusion is beneficial, but the financial sector finds it unappealing to meet the necessary demand because of a lack of acceptable instruments, such as enough collateral to secure the facilities, inadequate credit monitoring, and expensive credit costs.

Synopsis of the Nigerian Financial Services Industry

A range of levers, policies, regulations, and laws govern the operations of the several players in Nigeria's financial services sector, which offer both large- and small-scale services. Negotiations, transfers, and payments serve as the main assessment tool for financial inclusion (FI) and serve as the basis for the many interpretations of the term (DFS, 2019, 2017). The adoption of universal banking approaches and paradigms by the largest banks, along with the growth of mobile money brokers, microfinance, merchant banks, and mobile payments-all driven by the objective of financial inclusion-benefits the nation's diverse banking sector (CBN, 2012). Development economists contend that in the absence of inclusive financial institutions, the poor and small enterprises may choose not to take advantage of favourable growth opportunities or make critical decisions about accumulating human and material capital (Ashraf et al., 2010; Dupas & Robinson, 2009). Due to shortcomings in the financial system, such as information asymmetries and transaction costs, the poor are likely to become impoverished and experience a "poverty trap" that will restrict their opportunities, exacerbate inequality, and impede development (Aghion & Bolton, 1997; Galor & Zeira, 1993; Banerjee & Newman, 1993). Allen et al. (2016) noted that a more financially inclusive environment is linked to lower banking costs, easier access to branches, and less paperwork needed to open an account. This was found using data from 123 countries and over 124,000 individuals. They found that rural areas and the underprivileged benefit more from inclusion-promoting activities.

Enhancing Financial Services Quality and Affordability

According to the United Nations-Terminology Database, "financial deepening" is a word that experts in economic development often use. It suggests that financial services will become more widely available and serve various socioeconomic classes. The deepening of the financial system is usually shown by an increase in the money supply compared to the GDP or any other price index. It also discusses changeable currency. The more liquid the money supply in a given market, the higher the economy's potential for future development. The World Bank (1989) describes banking sector growth as an increase in the stock of Securities. Okafor et al. (2016) and Shaw (1973) assert that specialisation in financial tasks and institutions is necessary for the process by which structured local markets and institutions connect with global markets. Shaw underlined that expanding the scale of the monetary system itself will provide doors for other firms to function economically, including bill dealers, capital market operators, commercial banks, and insurance companies. Experts in economic growth often refer to this process as "financial deepening". It suggests that financial services will become more widely available and serve various socioeconomic classes. It also refers to the macroeconomic effects of financial deepening on the broader economy.

Deepening of the financial system is usually shown by an increase in the money supply in comparison to the GDP or any other price index. It suggests reusable money. The more liquid the money supply in a given market, the higher the economy's potential for future development. The financial deepening hypothesis states that the financial system's activity determines how much it contributes to economic growth. Increased intermediate activity in the economy was expected to result in more efficient allocations. Two basic quantitative metrics commonly used to estimate the size of the financial industry are the "intermediation ratio" and the "monetisation ratio". The

monetisation ratio includes money-based measurements or liquid liabilities, including the broad money supply to GDP ratio. Indicators for market- and bank-based measures, such as the stock market's capitalisation ratio and private sector credit, are included in the intermediation ratio. A general indication of the size of the financial sector was employed in our study. It is the proportion of the broad money ratio (typically m_2 or m_3 to the country's GDP), which quantifies the amount of intermediation to GDP. It is widely believed that financial deepening provides an economy with significant stability advantages, notwithstanding certain constraints. For example, financial deepening can increase transaction volumes, and so enhance the capacity to mediate capital flows without significant swings in asset prices and currency rates. However, it can also attract volatile capital inflows, making macroeconomic management more difficult (IMF, 2011).

Paul (2017) describes financial deepening as the result of all intermediate financial system activity in a particular country. It involves the development of institutions and markets that facilitate investment and growth. It is the extent to which the various interdependent components of the financial framework effectively advance a country's interest.

Financial deepening impacts people's and societies' economic circumstances. Financial deepening may take many different forms, such as growing financial markets and institutions, increasing the range of financial instruments available, and helping the underbanked and financially excluded individuals. Financial deepening is crucial for financial institutions to efficiently support growth of economies.

According to Merton and Bodie (1995), financial institutions frequently impact financial deepening, which raises savings and mobilises investment levels. The macroeconomic circumstances of a country may be impacted by financial deepening. The money supply's contribution to the GDP or other price indices increases with financial deepening. It might lead to

more liquidity. Having money may give more opportunities for growth and investment. Financial deepening is an attempt to justify genuine innovation and development in traditional and non-traditional financial services (Valverde et al., 2004). Nzotta and Okereke (2009) define financial deepening as an economy's financial institutions' ability to allocate funds for investment objectives successfully.

Conversely, in a less developed financial system, consumers are compelled to use pricey unofficial sources like money lenders, have restricted access to capital, and are constrained by the quantity of money they have on hand. A reduced pace of economic growth would be the consequence of fewer economic activity being able to be sustained and less money being available. Encouraging well-managed financial deepening can improve low-income countries' (LICs) ability to withstand shocks, improve the effectiveness of macroeconomic policies, and promote robust, sustained inclusive growth. The risk and susceptibility of poor individuals and their ability to get basic services like health and education can be greatly impacted by financial deepening. This might have a direct impact on reducing poverty.

Notions and Landscapes of Financial Exclusion

A certain segment of society was left without any rights or advantages provided by the mainstream socio-economic framework in life due to conflicting principles that may be classified as social, economic, and financial concerns (UNCTAD, 2021). Regardless of the specifics of each type of exclusion, they all suggested that some groups were not willing to blend in with society at large or that those who were excluded were predisposed to stay away from it (Francis, 2002; De Haan, 1999; & Sen, 2000, 1976, 1975). In addition to the numerous underlying factors ingrained in its nature, the economy itself and the cultural norms of the society continue to play a critical

part in the systemic problems of exclusion in any form (Ozili, 2018). Furthermore, there is a vicious cycle of exclusion that cannot be overcome without intentional inclusionary procedures and mechanisms, such as funding, credit availability, and social group empowerment. Financial exclusion has presented global leaders with a number of challenges since the dawn of time, especially as attention has switched to monetarist, market-driven policies (Ozili, 2018). From that point on, it has been essential to shift away from the past practices of discrimination and the institutions and groups that upheld them in favor of the human community. The many exclusionary behaviors that exist now can, at most, be attributed to previous, continuous exclusionary processes. It is now believed that addressing the perceived historical challenges communities have had throughout human cohabitation is the most effective strategy to solve the current issue of financial exclusion. Park and Mercado (2018) state that while these financial inclusion strategies differ from country to country, it is important to comprehend the fundamental concepts associated with the numerous variations. Okili (2018) provided the following concepts and illustrations to explain the evolution of the global financial systems.

The Hunting era and Economic Exclusion

Hunting was a life-sustaining activity in the old world, usually done in groups with the intention of dividing the rewards equitably. To address the community's requirements to starve off hunger at the time (Conklin, Laura, & Graham, 1997; Kurien, 1995). But over time, certain hunting clubs began to innovate their own techniques by sharing the spoils less fairly among themselves. This tendency creates a society in which some wealthy people prioritize their own financial interests over the rights of others in order to fulfill their own desires and ambitions. The system established the conditions for a lack of general demand for the items that were produced, leading

to overproduction and other associated problems as well as societal discontent. This contradiction helps to explain why some scholars believe that exclusion is a normal strategy that results from a market-driven, want-based economy (Kumar, 2011).

River Bank Settlements and Exclusion

Numerous studies by Yu Fang, et al. (2017) and Ozili (2018), showed evidence of modest agricultural activity throughout the Old Stone Age, mainly the cultivation of vegetables. Because people were living along riverbanks for sustenance, this occupation grew accidentally to become the main activity of emerging societies at the period. (This also happened around the time when people discovered fire and the use of taste in cooking). This set off a cycle of trading activity involving the entire society. Then, each person's significance in the group was determined by the quantity of products they could grow and prepare. According to Siddiqi, Mazhar-ul, and Baluch (2004), an economic proxy's asset was his tangible work weight because money wasn't accessible at the time. Consequently, a ranking system developed at that time in which the hunter is considered superior, earns and brings home product, and has the ability to distribute the goods to other members of the community. Before long, people were congregating by the riverbanks, necessitating joint efforts to cultivate and gather agricultural goods as well as self-help. As a result, people can start moving goods about the neighborhood. In response to worries about human impacts on rivers, the then-emerging clusters soon developed into centers for the distribution of people throughout several bodies of water, streams, and waterways for trade, transit, and resource utilization. The growth in size and value of the exchange economy necessitated the development of a medium for the easy and rapid interchange of goods and services. Unaware that they could utilize anything like money or coins in the same manner that we do now, people naturally began using precious stones and metals as a method of exchange. The advent of money and coinage

backed by existent state governments swiftly ushered in a new era in the history of commerce (Beati, 2021; Strauss & Ilana, 2016).

The Barter Economy and the Evolution of Finance

Through barter, money originally appeared in Adam Smith's trade and later emerged as a means of trade-off, a gauge of worth, and a storehouse of plenty to support financial transactions and commerce (Beatti, 2021). Due to a number of variables, including large-scale manufacturing, technological improvement, population growth, and many more that are frequently credited to the current boom, money became more significant than it has ever been. It was soon evident from the situation that only those with sufficient means, assets, or abilities could produce enough items to engage in the trading technique. These days, people can borrow money from a number of institutional and informal sources by pledging their possessions, such jewels, real estate, or homes. When they sell the items, they earn a return on the money they invested in the producing process. Money became more and more important in an exchange economy, and people began to explore for methods to get more of it. Interest rates were imposed by individuals and companies in the financial industry, and as a result, economies where money is king were created. Any financial exclusion from the system is tantamount to social exclusion, and this will unavoidably lead to the deprivation of other economic actors. Ozili (2020) divided the theories of financial inclusion into the following groups using well-established problem-driven social science research approaches and a variety of theoretical frameworks to evaluate the various barriers.

The Banking Industry and Agricultural Finance in Nigeria

Nigeria's banking system is composed of regulators and a number of players in the various financial services ecosystem divisions. Central Bank of Nigeria, acting as the primary regulator of the financial system; alongside the Federal Ministry of Finance and the Presidency, constitute the country's monetary authority.

To supervise operations, regulate activities of actors, and provide long-term financing, the following organisations run the capital markets:

- i) Securities and Exchange Commission (SEC), a Government Agency responsible for regulating and developing the Nigerian Capitalmarket.
- ii) Trading in a variety of listed securities is facilitated by the Nigerian Stock Exchange (NSE).
- iii) Development, or specialised financial institutions (DFIs/SFIs), were developed to bridge the domestic market's term lending and fiscal gaps.

These are state-owned companies that receive money from time to time from both the governments of the nations in which they operate and from multilateral finance and donor organisations in order to provide standby credit lines with government guarantees or long-term loans in foreign currencies. After that, the DFIs retail lend the money, primarily to public and private businesses, with the intention of "jumpstarting development by the bootstraps." According to Adesoye et al., (2012), DFIs are categorised as follows:

- a) Bank of Industry (BOI).
- b) Bank of Agriculture (BOA).
- c) Nigerian Export-Import Bank (NEXIM).
- d) Federal Mortgage Bank of Nigeria (FMBN).
- e) Infrastructure Bank;

O'dua Investments Limited, which is governed by all subnational governments in Nigeria's South-West geopolitical zone, and the New Nigeria Development Company (NNDC) Limited, which is controlled by all states in Northern Nigeria, are two examples of second-tier DFIs. State-owned finance and investment companies operating in all 36 states as well as the Federal Capital Territory, Abuja, make up third-tier DFIs. Among many others, market facilitators, investment managers, brokers, jobbers, issuing houses, registrars, and market facilitators are examples of market operators in this sector of the financial industry.

The following significant players are included in the CBN bulletin (2022) as money market operators or institutions that provide short-term financing:

- a) Commercial Banks also known as Deposit Money Banks (DMBs).
- b) Primary Mortgage Institutions (PMIs).
- c) Community Banks (CBs) which eventually gave way to Micro Finance Banks (MFBs).
- d) Non-Bank Financial Institutions (NGO-MFIs) and
- e) Discount Houses.
- f) Finance Companies (FCs)
- g) Bureaux de change (BDCs)

There is still a significant supply and demand mismatch for agricultural finance in Nigeria, estimated to be worth at least USD 4 billion yearly, despite the implementation of these intricate processes (Sahel, 2014). According to the poll, numerous SMEs are either unable to meet the stringent standards of commercial banks or are too large to be eligible for loans from microfinance groups. Without more focused support, Nigeria may not have achieved its complete food security

and agricultural output potential. To fill the financial shortfalls, Central Bank of Nigeria (CBN), alongside Federal Ministry of Agriculture and Rural Development (FMARD), created various incentives, and spearheaded the commencement of financial inclusion programs in Nigeria. As the country's apex Bank, CBN led the pack in launching and implementing financial inclusion initiatives to help increase access to financial services throughout the country. CBN launched the National Financial Inclusion Strategy (NFIS) in 2012 in its bid to reduce the percentage of those Nigerians who have no access to banking facilities. To carry out its duties, the NIFS periodically issues guidelines, which outlines specific instructions to help drive the nation's financial services landscape radically. Over the last five years, it has established various institutions, programmes, and initiatives. These consist of the Nigerian Incentive Risk-based System for Agricultural Lending (NIRSAL), the Micro, Small, and Medium Enterprises (MSME) Development Fund, and the Commercial Agricultural Credit (CAC) Fund, which is housed at the CBN. More importantly, efforts are underway to use alternative financial service entry points outside physical bank offices. A range of channels, such as cell phones, ATMs, Point-of-Sale (PoS) devices, and Agent Banking, are routinely pushed, even in distant areas. These new service offerings encourage consumers to use financial services more frequently because of how accessible and familiar the venues are. The poorest individuals are finding it easier to obtain financial services thanks to the advent of agent banking as a sustainable financial inclusion strategy in rural areas. Lagos Business School (LBS) examined the condition of the country's digital marketplaces in its Digital Financial Services (DFS) reports for 2017 and 2019. Tables 2 and 3 below present David-West et al. (2017) summary of the digital landscape.

Table 2: The Nigerian Mobile Money industry

S/NO	indices	Classification	2013	2014	2015	2016
1.	Mobile Money Dealers	Individual/bank-led	-	-	13/8	17/9
2.	Financial Access	Banked	48.5%	52.6%	47.0%	41.1%
		Under-served	8.5%	10.8%	10.0%	10.6%
		No bank facilities	43.0%	36.6%	43.0%	40.4%
3.	Fin. Services Penetration	Savin deposits	-	-	64.8%	60.0%
		Loans & advances	-	-	26.1%	27.4%
		Insurance	-	-	5.6%	2.5%
		Underwriting	-	-	40.8%	23.7%
4.	Mobile Money	Operative	0.3%	0.8%	0.1%	1.1%
		Awareness	12.3%	12.9%	15.8%	14.0%
5.	Mobile Money Accounts	Signed up	0.1%	0.5%	0.8%	1.3%

Source: Adapted from David-West et al., 2017.

According to DFS's monitoring of the situation in 2019, there has been a slight improvement from 2008 to 2018. The proportion of unbanked persons fell by 4% in 2018, while the rate of ordinary financial inclusion remained stable at 48.6%. This resulted in a corresponding 4% decline in the rates of under-banked people. Just 8.4% of the underserved study's sample learned about mobile services, and only 4.1% of those without a financial connection knew about digital (mobile money) services. The fact that 56.4% of respondents who had bank accounts could obtain loans indicates the increased accessibility of traditional credit, according to the poll. It further said that the voters' use of their cards to create accounts with higher KYC levels and bigger daily transaction limits was connected to the rise in credit recipients. Nonetheless, the underbanked and unbanked population in rural regions is usually above 70%, indicating inequalities in infrastructure distribution, internet resource accessibility, and the lack of access to digital tools needed for transaction execution and monitoring. According to the survey, the percentage of banked individuals is split evenly between rural and urban locations.

Table 3: The Nigerian Financial Access Segments: 2008 - 2018

S/No.	Period in years	Served by Bank (%)	Under Served (%)	No of Banks (%)
1	2018	48.6	14.6	36.8
2	2017	48.6	10.7	40.8
3	2016	41.1	10.5	48.4
4	2015	47.0	10.0	43.0
5	2014	52.6	10.8	36.6
6	2013	48.5	8.5	43.0
7	2012	43.0	17.3	39.7
8	2011	39.4	30.6	30.0
9	2010	36.3	17.4	46.3
10	2008	23.6	23.9	53.5

Source: Adapted using the survey data from EFINA, Intermediate and World Bank (2023)

Bruett (2019) listed the benefits of digital accounts for the majority of people, particularly those living in rural and impoverished areas. He asserted that digital finance might be extremely advantageous for rising and developing nations, as well as any nation for that matter. According to the Group, particularly the Mobile Association (GSMA Annual Report, 2018), contributions from mobile technology and services to the global economy in 2018 were \$3.9 trillion, or 4.6 the world GDP. By 2023, this amount is predicted to rise to \$4.8 trillion, or 4.8% of the global GDP.

McKinsey estimated in 2016 that digital finance may increase the GDP of emerging economies from 5% to 10% over a ten-year period. However, these gains might not balance the drawbacks, particularly in Asia and Africa. In addition to the well-known obstacles related to business models, strategies, product subjects and programmes, Mckinsey's investigation revealed cases in some African countries where individuals chose to remain economically excluded because, in their view, a digital account, while appearing to be a good solution to some observable barriers to raising funding capacities, was not actually a good solution; better than cash, and it did not address the pressing issue. Hence, the financial inclusion community has a dilemma: how to promote digital finance as something that is thought to be beneficial for development even while it might not necessarily provide significant short- and medium-term advantages for a big number

of the world's poor? Programmes for sustainable development center on agriculture and agro-allied enterprises, which make up the majority of farmers' jobs. As such, due consideration is being given to the establishment and expansion of rural and agricultural businesses. Numerous governments, including Nigeria, have shown interest in the agricultural sector due to its capacity to both foster and expedite long-term economic growth and development (Seth & Acharya, 2018; Otiwu et al., 2018; Ogbonna & Atsanana, 2017; Olaniyi, 2017; Nwanne, 2015). By doing this, Nigeria seeks to restore its export power from the 1960s. In addition to exporting commodities to other countries, more countries are joining the ranks of those that also supply domestic needs for the manufacturing and/or industrial sectors and export rice, wheat, shea butter, ginger, sesame, soybeans, and other foods. These commodities include cotton, cocoa, groundnuts, and palm oil. Affirmative action initiatives that promote self-employment, entrepreneurial skill development, and growth of the real sectors, especially the non-oil sector. Agriculture, and Rural growth, as well as Small and Medium Enterprises (SMEs) are strongly promoted since they offer a potentially viable substitute for wage employment. Because small, medium, and large business owners may access affordable financial services, rural inhabitants can operate independently and freely and sustain their families and communities.

The Principles of Bank Credit and Economic Growth

Without a doubt, agriculture has enormous potential to promote wealth in any economic structure. Agriculture in Nigeria accounts for 65% of the nation's labour force, which generates between 30% and 42% of the country's GDP (Bello, 2021; Osabohein, 2019; Emeka, 2007). As per the World Bank (2007) and Abdulahi (2002), the Nigerian economy has benefited from the agricultural sector's provision of goods, factors, markets, and foreign exchange. Similarly,

development economists assert that agriculture is the main engine of economic growth in all nations, especially in Africa (including Nigeria). The "physiocrats," who study development economics, contend that the transfer of agricultural surplus via a transaction network drives the economy and is primarily responsible for its management. They contend that the agricultural sector, the sole genuine sector in the economy as a whole, produces surpluses necessary for the operation of other sectors.

Since agriculture employs most of Nigeria's workforce, it is the engine that powers the economy's primary support system. In light of the aforementioned, it is evident that Nigeria's agriculture is a vital instrument and engine for economic growth. However, this important duty cannot be performed or completed without finance's crucial role and contribution. All acquisitions in the agriculture sector, such as land, buildings, machinery and equipment, hiring workers, promoting innovative and practical technologies, etc., require financing. As a result, it is imperative to stress that agricultural credit, or finance, is a vital development element that speeds up agricultural investment and the uptake of cutting-edge technology, both of which are required to ignite Nigeria's rapid growth. Fiscal deficits, trade balance gaps, and savings gaps have also been found to be growth inhibitors in several African countries, including Nigeria (Mallik, 2008). A substantial body of research has examined the role of finance in promoting economic growth. According to Beck et al., 2000; Ariyo, 1999; Thirlwall, 1976; the interrelationship between the two variables, has been a subject of several studies. A number of studies amongst them have reached the conclusion that financing for agriculture, especially in developing countries, has an impact on economic growth (Adesanya, Ajala, 2019; Olaniyi, 2017;). However, most of the previously described research on this subject employed a straightforward descriptive assessment of some relevant parameters.

According to Investopedia (2017), bank credit is the entire amount of money that a banking institution and other financial derivatives lend to an individual or business. It stands for the entire sum of money that a person or company has received loans from financial institutions. In addition, it refers to an agreement between lenders and borrowers whereby lenders lend money to borrowers on the condition that the latter repay the loan balance plus interest at a later time for either a loan or a line of credit. Borrowers can use these loans to grow their business operations, make large purchases, and make investments. Furthermore, it establishes the lowest feasible recurring installment payment for a certain time frame.

Ihimodo (2005), Heidhues (1995), Miller (1977), Adegoye & Dittoh (1987), Ogunmuyiwa, Okunneye, & Amaefule (2017), John & Terhemba (2016), and Yakubu & Affoi (2014) state that bank credit is the hard cash that the bank or creditor forfeits in order to grant the person or entity that needs it. Ijere (1996) asserts that credit may be given in accordance with a factor's capacity to encourage or motivate further production-related factors. It might bring dormant or underutilized powers back to life. According to him, credit acts as a growth-promoting agent, allowing it to utilize its natural ability to progress in a goal-oriented manner. It suggests that as capital inflows grow, the economy will be more likely to follow its projected path. As a result, credit serves as the key or the ability to reveal latent abilities, skills, possibilities, and vision, and it also acts as the catalyst for economic expansion. Farmers and owners of agro-businesses can utilize farm finance, sometimes referred to as agricultural financing, for capital needs related to land, production, and ongoing expenses. Per Abhiman, Manjusha, Joice (2009), production credits are often short-lived and can be used to purchase agricultural inputs such as seeds, fertilizer, manures, feed, herbicides, insecticides, and fungicides. Farmers also require bank credit in order to cover additional working capital costs, such as those associated with employing, using,

maintaining, and repairing machinery and equipment; paying salaries, taxes, rent, and land fees; and covering other continuous overheads and consumer expenditures. According to Adomola & Umar (2001), credit "may serve as a component to other government activities in facilitating investment or as a substitute for it." In this instance, credits may be associated with the provision of certain services and oversight that are required, or they may simply serve to facilitate and filter loanable funds in order to promote capital accumulation within the agriculture sector. It may represent long-term capital creation in the form of planting tree crops and supplying building materials, or it could simply satisfy the need for operational capital to endure from planting to harvest. In all of its manifestations and uses, credit is essential to the growth and functioning of an economic sector.

Because banks serve as a middleman between the surplus units of the economy that offer deposits and the deficit-spending units of the economy that need money for productive reasons, credit and the banking sector are closely intertwined. In an economy, banks serve as a link between the sections that are in excess and don't require as much money and the parts that are in deficit and require money for investments. Financial institutions charge for loans, and the terms of those loans differ according on the bank, the type of loan, the borrower's credit score, and how the money is used. Bank credit may be divided into two primary categories: secured loans and unsecured loans. Depending on the product, different fees, interest rates, terms and conditions, regulations, and collateral requirements apply (Investopedia, 2017). Financial institutions have the advantage of serving as catalysts for economic advancement because of their intermediation responsibilities.

Growth in the market value of the goods and services produced by an economy over time, adjusted for inflation, is known as economic growth. Real Gross Domestic Product (GDP) or Gross National Product (GNP), which is usually expressed in terms of population, is commonly used as

an estimate (Kuznets, 1955). Dewett (2005) defined economic growth as an increase in the net national product over a given time period. Todaro and Smith (2006) provided an alternative perspective on the subject by defining economic growth as a steady process that raises the economy's productive capacity over time to generate rising levels of national production and revenue. Conversely, Jhingan (2006) reduces the complexity of economic growth to the definition of a rise in production. Gross domestic product (GDP) is the basic unit of measurement used to describe economic growth. The financial intermediation activity carried out by financial institutions is necessary to sustain the GDP. Many important ideas in the literature support the idea that financial institutions may promote economic development. The Shumpeterian theory, which focuses on innovations that improve quality, the Marxian theory (which explores the six phases of growth), the endogenous growth theory, the neo-classical model of development, the Harrod-Domar theory of growth (which stresses saving and the capital output ratio), and Shumpeterian theory are a few examples. The neo-classical model of growth and the endogenous growth theory are two growth theories that are pertinent to this investigation. Neoclassical growth theory posits that labour and Capital are two essential factors of production. In particular, they expressed the concept as $Y = f(K, L)$, where K denotes the entire capital stock, L denotes the labor force, and Y stands for total production. Combining technology and human capital will result in $Y_{i,t} = A K^{\alpha} (L h)^{1-\alpha}$ (Weil, Mankiw, & Romer, 1992). In general, bank credit facilitates the acquisition of additional funds for the production function. When a new technology becomes accessible, labor and capital must be modified to maintain growth equilibrium. Bank financing plays a crucial role in helping people purchase new technology, which in turn increases total factor productivity (Timsina, 2014). The efficiency/productivity channel is lubricated and investments are encouraged by small-scale firms and private sector credits, all of which support economic growth.

The problem with Neo-Classical Growth Theory is addressed by endogenous growth theory, a new growth theory. According to the proponents of the endogenous growth theories, neoclassical theory has limitations in the fact that the latter relies on exogenous factors, while also assuming an inverse relationship between productivity and the quantity of inputs utilized. In contrast the endogenous theory posits that economic growth is driven by internal factors. They also content that there are increasing returns to scale. Thus, the theory suggests that the long-term growth rate of an economy may be influenced by policy choices (Barro, Sala-i-Martin 1995; Aghion, Howitt, 1992; Romer, 1986), among other considerations.

Bank credit is the entire amount of money a banking institution and other financial derivatives lend to an individual or business (Fadun & Silwimba, 2023; Fadun & Oye, 2021, 2020). It stands for the entire sum of money that a person or company has received loans from financial institutions. In addition, it refers to an agreement between lenders and borrowers whereby lenders lend money to borrowers on the condition that the latter repay the loan balance plus interest later for either a loan or a line of credit. Borrowers can use these loans to grow their business operations, make large purchases, and make investments. Furthermore, it establishes the lowest feasible recurring instalment payment for a specific time frame.

Some studies highlighted that bank credit is the hard cash that the bank or creditor forfeits in order to grant the person or entity that needs it (Ogunmuyiwa et al., 2017; John & Terhemba, 2016; Yakubu & Affoi, 2014; Ihimodo, 2005; Heidhues, 1995; Miller, 1977; Adegoye & Dittoh, 1987). Ijere (1996) asserts that credit may be given to a factor's capacity to encourage or motivate further production-related factors. This may result in dormant and underutilisation of capability. Credit acts as a growth-promoting agent, allowing it to utilise its natural ability to progress goal-

oriented (Fadun & Silwimba, 2023). It suggests that as capital inflows grow, the economy will be more likely to follow its projected path. As a result, credit serves as the key or the ability to reveal latent abilities, skills, possibilities, and vision, and it also acts as the catalyst for economic expansion. Farmers and owners of agro-businesses can utilise farm finance, sometimes referred to as agricultural financing, for capital needs related to land, production, and ongoing expenses. Abhiman et al. (2009) noted that production credits are often short-lived and can purchase agricultural inputs such as seeds, fertilisers, manures, feed, herbicides, insecticides, and fungicides. Farmers also require bank credit to cover additional working capital costs, such as those associated with employing, using, maintaining, and repairing machinery and equipment; paying salaries, taxes, rent, and land fees; and covering other continuous overheads and consumer expenditures. According to Ademola and Umar (2001), credit "may serve as a component to other government activities in facilitating investment or as a substitute for it." In this instance, credits may be associated with providing certain required services and oversight, or they may facilitate and filter loanable funds to promote capital accumulation within the agriculture sector. It may represent long-term capital creation by planting tree crops and supplying building materials, or it could simply satisfy the need for operational capital to endure from planting to harvest. In all of its manifestations and uses, credit is essential to the growth and functioning of an economic sector.

Banks serve as a middleman between the surplus units of the economy that offer deposits and the deficit-spending units that need money for productive reasons as credit and the banking sector are closely intertwined (Fadun & Silwimba, 2023; Fadun, 2021). In an economy, banks serve as a link between the sections that are in excess and do not require as much money and the parts that are in deficit and require money for investments. Financial institutions charge for loans, and the terms of those loans differ according to the bank, the type of loan, the borrower's credit

score, and how the money is used. Bank credit may be divided into two primary categories: secured loans and unsecured loans, depending on the product, different fees, interest rates, terms and conditions, regulations, and collateral requirements apply (Fadun, 2021, 2020). Financial institutions have the advantage of serving as catalysts for economic advancement because of their intermediation responsibilities.

Credit supply to Agricultural policies and Programmes in Nigeria

The Nigerian government created a number of programmes and initiatives to boost the agricultural sector's production capacity in an effort to address the challenges with agricultural financing that were causing insufficient agricultural output (Nwakwo, 2013). The government at all levels created the various financial arrangements or programmes known as agricultural finance schemes to make it easier for farmers to receive funding to boost agricultural productivity.

Apart from financial endeavors, insurance and guarantee schemes are designed to aid farming families and agricultural businesses in the event of unplanned events, disease outbreaks, pest infestations, and dangers and uncertainties that are covered by insurance. They also aim to inspire individuals to adopt cutting-edge farming techniques, high-value inputs, and contemporary technology (Adejumo & Bolarinwa, 2017). Among these are the Agricultural Credit Support Scheme (ACSS), which was created in 2006, the Supervised Agricultural Credit Scheme (SACS), which was developed in 1979, and the Special Emergency Agricultural Loans Scheme (SEALS), which was founded in 1984 (Egwu, 2016). In the late 1920s, the CBN introduced the Nigerian Incentive based Risk Sharing system for Agricultural Lending (NIRSAL), the Small and Medium Scale Enterprise Credit Guarantee Scheme (SMECGS), and the Commercial Agricultural Credit Scheme (CACS). Though it's not technically a plan, it encourages farmers to take out loans from

commercial banks, guaranteeing the farmer up to 60% of the interest paid. It is also recommended that farmers obtain disaster insurance for their holdings. In keeping with its developmental mandate, the Central Bank of Nigeria (CBN) introduced the Anchor Borrowers' Programme (ABP) in 2015. This was done to lower the high expenses suffered by the government when importing food crops or agricultural items that can be produced domestically, in addition to encouraging institutional improvements in the banking system. This is a result of the fact that many banks consider agricultural loans to be high-risk and try to direct financing toward less risky industries. This behavior has to be objectively measured in the Nigerian context. Lenders can get information about potential borrowers' credit worthiness since farm households have comparatively distinct resource endowments, output prospects, and consumption patterns. Ijaiya et al. (2017) conducted study on the impact of Nigeria's Agricultural Credit Guarantee Scheme (ACGS) on agricultural output and food security in 2017. Their findings demonstrated the importance of loans from the Agricultural Credit Guarantee Scheme Fund to Nigeria's agricultural sector, showing that the sector's output rose, the economy expanded, and poverty was notably reduced. This led to the creation of unique agricultural support programmes by sub-national governments, which improved Nigeria's agricultural output (Ijaiya et al., 2017; Kehinde, 2012). Other agencies established by the Federal Government of Nigeria included the establishment of non-bank Development finance institutions such as Peoples Bank of Nigeria (PBN), Family Economic Advancement Programme (FEAP), and Nigerian Agricultural & Cooperative Bank (NACB). The latter three were subsequently bought over by Bank of Agriculture (BOA), early in the millenium. As currently constituted, Bank of Agriculture is a state owned agricultural Bank through the Federal Ministry of Finance (FMF), incorporated, with 60% ownership. Central Bank of Nigeria owns the other 40%. BOA has gone through several restructuring and transformarion initiatives since its creation

in 1972 when it started as Nigerian Agricultural Bank (NAB). Thereafter, the next four decades witnessed the expansion of its mandate to embrace financing of rural development and Financial advisory services. This was the major reason for the name changes from Nigeria Agricultural and Cooperative Bank (NACB in 1978) to Nigeria Agricultural, Cooperative and Rural Development bank (NACRDB in 2000) Nigeria's premier agricultural Finance Institution subsequently became Bank of Agriculture (BOA) in 2000, still maintaining complete government ownership. More than twenty years after, Government is still considering the options of partial privatization or full commercialization of the Bank.

Currently, the Bank provides funding to all of Nigeria, but it is most active in the country's rural areas. At the same time, it also provides customers in cities with loan and deposit mobilisation services. David (2011) claims that the bank had a mandate to lend 70% of its loan portfolio that is, N250000 (\$1,666) or less to the agricultural sector at single-digit interest rates. Both the interest rate cap and the comparatively low repayment rates have been shown to jeopardise the institution's existence, making it more difficult for it to meet the demand for loans from its target market. According to Babajide (2020), the majority of financially excluded individuals in Nigeria are farmers. He responded by proposing more funding for their business ventures, saying that this would greatly increase output and productivity and, hence, contribute to the end of poverty. Hartarska et al., (2015), who also argued for large investments in agriculture, claimed that reducing financing barriers in this industry would hasten the adoption of innovative technologies a critical component needed to spur economic growth. Banks are expected to vigorously push this demand since they are the primary conduits for funding the actual sectors of the economy, including the agriculture sector. Unfortunately, most of them would prefer to lend money based on expected client revenue, especially in the case of microloans, because they are so risk averse when it comes

to funding the agricultural industry (Osuma et al., 2018). According to several academics, in order to support and improve agricultural growth and widen a country's economic base, agricultural finance needs long-term funding (Okunlola & Oke, 2018; Okunlola, 2014; Obansa & Maduekwe, 2013; Omilola & Lambert 2009; Manyong et al., 2005). Udih (2014) noted that bank lending to the agricultural industry is still far too small to make a discernible difference.

The amount allocated to the agricultural sector is small in light of the importance of the sector and the data that are currently available from Nigerian commercial banks. According to his claims, the credit allocation of the sector fluctuated between 6.9% and 10.66% in 1985, between 10.66% and 16.15% between 1985 and 1990, and between 16.15% and 17.5% between 1990 and 1995. It fell sharply to 8.07% in 2000 and then varied in 2005, 2010, and 2013 between 1.67% and 3.44% (CBN Statistical Bulletin, 2013). This ratio may have improved as a result of the CBN managing more intervention money through other Nigerian governmental organisations. Since the 1970s, Nigeria's government has worked to revitalise the agricultural industry in an effort to increase the nation's food self-sufficiency. The goal of the government's credit policy creation plan was to promote the expansion and development of agriculture. In order to improve the standard of living for Nigerians, the main goal was for the agricultural subsectors to grow at a self-sustaining rate.

According to Central Bank of Nigeria (2007), ensuring that a solid infrastructure was in place to support credit schemes was the main objective of agricultural financing programmes and policies. Other programmes and institutions that provide macro and microloans to small, medium, and large-scale manufacturers would also be a part of this system.

The Nigerian government has implemented a number of policies and programmes in an attempt to revitalise agriculture and solve the significant challenges that farmers face as a result of

inadequate credit finance. Nigeria's agricultural policy, which attempts to accomplish overall agricultural growth and sustainable development, includes the work plan and framework of the government. In light of the aforementioned, Nzota and Okereke (2009) emphasised that Nigerian agricultural policies had an effect on the extent and importance of financial deepening to economic development. These actions appear to have been crucial to Nigeria's agricultural economy's growth. The Nigerian financial system and government initiatives to promote agricultural expansion are intermediates and enablers of this progress (Akiri & Adufu, 2007). However, the Central Bank of Nigeria stated in 2007 that a number of government programmes and initiatives had failed over time for the several reasons including farmers' poor management skills; lack of loanable funds; lack of effective skills to deliver services; and reluctance on the part of commercial banks to support small businesses.

To enable funding for the sector's agricultural expansion, the government of Nigeria has been involved in a number of policy efforts on the delivery of agricultural finance services since the 1970s. Some of the organisations, projects, programmes, and initiatives that make up these policies are no longer in operation, while others are still in operation under a different name and organisational structure. A few examples include the Nigerian Family Economic Advancement Programme (1997 - 2001), the People's Bank of Nigeria (1990 - 2002), the Small and Medium Enterprise Equity Investment Scheme (2001 - 2008), the Rural Banking Programme (1977 - 1991), the Lending as a Percentage for Savings Mobilisation in Rural Areas to Rural Dwellers (1977 - 1996), and the Concessionary Interest Rate (1980 - 1987). Nonetheless, more details regarding Nigeria's still-in-effect policies are provided below.

Nigerian Agricultural Cooperative and Rural Development Bank

Founded in 1972, Bank of Agriculture (BOA) was formerly known as NACRDB. This is the Federal Government of Nigeria's first limited liability specialty financial institution. Up until now, Nigeria's specialized Agricultural Bank is state owned. The bank was established to actively participate in the process of encouraging rural farmers to develop banking habits, increase loan availability, and mobilise agricultural savings in order to reduce poverty. It focuses on the agricultural finance markets and conducts small-scale financial operations. The bank bridges the gap left by regular banks (commercial banks) with its distinctive banking focus on rural development. Its foundation was the Nigerian Agricultural and Cooperative Bank (NACB). Anyanwu (2004) said that NACB (now BOA) complies with its objective by accepting deposits and offering loans and advances with low interest rates.

Agricultural Credit Guarantee Scheme

The Nigeria's Agricultural Credit Guarantee Scheme was implemented in 1977, and researchers have been examining how it has affected Nigeria's economic growth. The ACGS seeks to give farmers the precise funding they require to help Micro, Small, and medium scale businesses (enterprises) in non-oil (agriculture and rural) sector, with an emphasis on strategic development. The ACGS promotes sustainable growth by offering credit facilities (funding) to a sizable percentage of rural population producers (Olaitan, 2006). Farmers can now borrow up to 75% more from banks without having to provide any security (collateral) thanks to the scheme's guarantee. The CBN establishes the guidelines and is in charge of managing the plan's overall administration. The Agricultural Credit Guarantee Scheme (ACGS) is one of the most important initiatives for encouraging and enabling agricultural financing in Nigeria's agrarian sector.

Community Banks (CBs)/Microfinance Banks (MFBs)

The goal of developing community banks, or microfinance banks as they are now called, was to establish a financial organisation that would offer Nigeria's rural populace traditional banking services on a microscale. Community banks are well-positioned to be institutions that provide rural citizens with structured lending options, with an emphasis primarily on the growth of rural economies. Community banks were created to fill a void in the rural economy caused by traditional financial intermediaries that disenfranchised the people and did not encourage farming. The banks allow all individuals, who are eligible, to gain ingress to loans, advances, as well partake of numerous financial services that have been made available to those who hold checked accounts. All this, in an effort to empower the people by giving them more control over production-related variables. According to Onugu's (2000) research, the CBN's 1996 monetary credit guideline mandated that 18% of the bank's credit should be allocated statutory funds for agricultural enterprises.

Nigerian Agricultural Insurance Corporation

Farmers in the agricultural sector had a pressing need for insurance coverage, which led to the founding of the Nigerian Agricultural Insurance Corporation (NAIC). The government created it on the grounds that standard insurance companies would not cover agricultural activities (where they were deemed risky). As a result, there was a need for a specialised agricultural insurance company. Protecting Nigerian farmers against natural catastrophes and other dangers associated with agricultural output is the main duty of NAIC. Providing the necessary insurance coverage for all loans granted to the industry by banks under the Agricultural Credit Guarantee Scheme (ACGS) is one of this company's major responsibilities. The insurance coverage has considerable

socioeconomic impacts, especially for farmers who receive any kind of credit related to agriculture from authorised lending institutions. NAIC is the only insurance company that the Federal Government of Nigeria fully owns.

Refinancing and Rediscounting Facility (RFF)

By utilizing this funding mechanism, Nigeria's apex Bank is able (CBN) to provide financial support to Commercial Banks. This done by offering short-term loan facilities at a favorable interest rate. The Rediscount and Refinancing Facility is a credit structure that is provided solely to support agricultural exports. It is a facility intended to boost the production unit by advancing and growing the agriculture sector through the export market. One of RRF's primary objectives is to encourage medium- and long-term bank financing to Nigeria's production sector in order to expand the country's production system.

Agricultural Credit Support Scheme

The Ministry of Agriculture and the Central Bank of Nigeria launched the Agricultural Credit Support Scheme (ACSS). The Ministry of Agriculture and the apex bank collaborated to fund the initiative and permit banks to participate in the ACSS to encourage agricultural entrepreneurship across the country. This programme's finances are only allotted (by concession) for agricultural uses, with a focus on loan assistance for small-scale farmers. The CBN (2007) states that the purpose of the lending initiative is to expedite commercial agriculture by providing loans with interest rates that are only one digit.

Agricultural Credit and Finance in Nigeria

According to Ugwu (2010), finance is one of the inputs required for agricultural expansion because it makes it easier to obtain other inputs required for productive production. There has been a lot of study and analysis done on the role that commercial banks play in supporting agricultural growth in Nigeria. Many experts believe that the agricultural industry cannot prosper if it does not have appropriate access to financing to fund its activities. In most countries, there is a market for agricultural loans. This market is made up of entities referred to as participating financial institutions and systems, who are able to provide loans in order to assist the development of agricultural farm products. This industry is controlled by Deposit Money Banks (DMBs). This industry is also served by other specialised organisations such as the Bank of Agriculture (BOA), which was originally started operations in 1973, strictly as an Agricultural Bank – Nigeria Agricultural Bank(NAB).

The banks have contributed significantly and will continue to do so under a set of incentives. If life insurance firms buy equipment to rent, they may find profitable ways to use their long-term capital. The unofficial banking system, which consists of families, friends, and cooperatives, that can also lend money to interested farmers, will continue to operate as it did previously. The unofficial financial market emerged as a result of the financial assistance that farmers obtained from their different associations (Kehinde, 2012). The borrower's size is important when negotiating the terms and cost of borrowing, because huge farms are rare. Due to penalties, which some people preferred to avoid paying, the agriculture sector profited when banks complied; however, this is no longer the case as a result of deregulation.

Gurdenson et al. (2003) claim that since Nigerian farmers are unable to obtain loans, this represents a cost in the delivery of agricultural products. Nigerian lenders are unwilling to provide

funding for development, hence the government must provide incentives for the process. As has been established, credit is the biggest threat to lenders in the market and can result from a variety of factors, including low market prices and a poor harvest. Underwriting or a guarantee, however, can greatly alleviate this. In addition, lenders in this industry must be aware of risks pertaining to pricing, strategy, liquidity, and interest rates. The CBN (2000) notes that Nigerians' agrarian culture has experienced significant change, with a dualistic structure reflecting both large- and small-scale commercial and subsistence farming, as well as a decline in youth interest in the sector. This is in addition to the ongoing problem of insufficient fertiliser to boost crop yields. Nigeria's landscape is dominated by peasant farmers, and the country's agricultural output is largely produced by modern methods (CBN 2003). From the Sudanese savannah in the north to the deep rainforest belt in the south, farming is possible everywhere due to the area's diverse natural zones. The following agricultural items are used in Nigeria to produce food, according to a 2003 report by IFPRI: cassava, yams, rice, vegetables, meat, millet, groundnuts, sorghum, cotton, and maize. The order in which they are discussed is not determined by their relative importance. But rice is the food that is most commonly consumed. Certain staples can be mechanised in their cultivation, however finance and smallholder land practices restrict this possibility. Since it becomes clear that the smallholder farmer may not have enough land to maximise the utilisation of credit when made available, financing can be made available to the farmer who has enough cultivable land to allow the process to be mechanised. Due to the expense of credit appraisal, lenders are also against helping small landowners. The majority of loans given to farmers in Nigeria for arable crops may have durations shorter than a year, which is appropriate for the banks' target market.

Due to the industry's sectoral credit distribution, bank lending to the agricultural sector grew significantly between 1978 and 1989. This has now been lost as a result of the banking

system's deregulation because of the belief that financing for agriculture is riskier, more challenging, and less profitable than financing for other industries. Despite growing food import prices, bank credits to this business are said to have increased over time, from over N 230 million (then around \$233 million) in 1978 to over N 262 billion (\$2.23 billion) in 2005 (CBN, 2007). For a bank loan to be effective there must be a seamless pricing and term transfer for both the bank and the farmer. Ojo (2002) discusses the ineffectiveness of the old community banks' lack of financing for agriculture after they converted to microfinance banks non 2007. Olaitan (2006) contends that this will lead to a rise in agricultural loans; however, considering the stance of these institutions over time, this may not hold true in the long run.

Current Credit Methods: Guarantee, Insurance and Underwriting Schemes

Farmers could not have obtained credit on their own due to their disadvantage and lack of collateral. Therefore, providing credit guarantees to the agriculture industry has greatly boosted the willingness of lenders to make loans to borrowers (Navajas, 2001). With the addition of the Nigeria Agricultural Insurance Corporation (NAIC), farmers will now be able to receive compensation for any output losses that may occur during the harvest season. Conversely, underwriting makes it easier to lock in agricultural commodity pricing and guarantees a steady stream of income for farmers. Because guarantors take financial responsibility in the event that the farmer(s) default, the existence of guarantors has made it simpler for lenders to provide money to potential borrowers (debtors). Kehinde (2012) noted that while the credit guarantee plan has its challenges, it does have the benefit of assisting farmers who would not have been able to access systemic financial facilities otherwise.

Sources of Agricultural Credit in Nigeria

In addition to the owners' capital, or personal finances, of the farmers, the agricultural subsector in Nigeria has access to a wide range of financing sources. These falls into two general categories: official and unofficial sources of credit.

Formal Credit Sources

These funding sources are financed by legitimate, authorized financial entities. Known by another name, formal lenders, they are authorized by law to act as the economy's intermediaries, taking deposits from the surplus unit and giving loans to the deficit unit. As a specialized financial institution, Bank of Agriculture was established to cater for credit needs in the agricultural sector. Others institutions, agencies and programs that followed later included Nigeria Agricultural Insurance Company (NAIC), Rural Banking program of government in the eighties, Licensed Community Banks, and Microfinance Banks (MFB), Agricultural guarantee mechanisms such as ACGSF, NIRSAL, and more recently in 2012, Financial Inclusion Strategy for Nigeria, championed by CBN. All institutions mentioned above are expected to compliment the activities of the country's Commercial banks in rolling out products and services in the real sectors of the commodity, in a manner that includes the underprivileged in the society.

Informal Sources of Credit

A formal credit system contrasts sharply with them. There are no strict rules or prerequisites to meet before using the credit. Because their actions are not considered formal from a legal standpoint, they are known as informal. They come from a variety of sources, including the farmer's own income, that of friends, family, and neighbors, as well as money lenders (Osusu), cooperatives, and farm associations.

Structure of the Rural Agrarian Credit Markets in Nigeria

Nigeria has a dual financial system where service providers, both formal and informal, work together to benefit the community in which they are employed. A well-known characteristic of a development challenge is the existence of both official and informal loan markets in most financial systems, particularly in the rural areas of developing nations (Birds & Tapp, 2008; Boucher & Guirking, 2007; Mohieldin & Wright, 2000; Kochar, 1997; Besley, 1995; Hoff & Stiglitz, 1990). Ghate (1992), drawing distinctions between the two markets, characterises the formal financial services providers as operators who are registered and, based on the services they specialise in providing, have been granted operating licenses. The central bank of each nation, which is often the licensing body, issues the licenses. He pointed out that in terms of branch distribution and the concentration of lending and deposit activities, these banks are mostly found in urban areas (Ghate, 1992). According to him, "informal financial services" encompasses all transactions, credit facilities, and savings made by operators who do not hold a license and conduct their business outside of the established monetary procedures (Ghate, 1992). This description encompasses the activities of middlemen such as friends, relatives, dealers, and money lenders, claim Kashuliza, et al., (1998). There are also semi-formal institutions, which are defined as companies that hold a financial services license (Steel & Andah, 2004). They are not managed by a single financial organisation. Formal financial service providers are institutional bodies created by legislation (Adekanye, 1986). It is their responsibility to gather financial resources and allocate them to investors. Additional examples of institutional lenders or official financial service providers were provided (Badiru, 2010). These included credit institutions, microfinance institutions, public owned development banks, and deposit money banks.

The Nigerian government established a number of agricultural lending institutions, including Bank of Agriculture (BOA) Limited. As semi-formal financial credit institutions, Badiru includes cooperative societies, nongovernmental organisations, and microfinance institutions (NGO-MFIs). He recognised the informal sources of funding known as rotating savings and credit associations (ROSCAs), sometimes referred to as tontines, susus, tandas, and dhikutis, that function in every village and hamlet in developing nations (CGAP, 2020). Historically, the two primary sources of funding for agricultural investments have been the farmer's own savings and farm loans. However, farming in developing countries carries inherent hazards, such as low yield and price volatility. Farm operations are frequently entangled in a vicious circle of low output, low investment, low savings, and low income, all of which contribute to further low output a phenomenon referred to as the "vicious cycle of poverty" (Nwagbo et al., 1989). Rural borrowers in particular are rarely a desirable proposition for formal financial institutions since they are perceived as high-risk borrowers and are unable to meet the modest borrowing requirements of institutional lenders (Onumah, 2003). Badiru's review of the literature included many other justifications for why farmers are unable to obtain official financing sources. Agnet (2004), for example, claimed that small-scale farmers had less access since they are less knowledgeable about the complex mechanisms of commercial banking. According to Philips et al. (2009), high interest rates and fixed loan terms that are too short do not work well for annual cropping, they do pose a barrier to credit availability, banks' perception of agricultural credit as a highly risky undertaking, and credit rationing policies are the sources of the limitation (Rahji & Fakayode, 2009). Financial lending institutions in Nigeria often decline to lend money to farmers because of the high costs of loan management and the common misconception that farmers have a high default rate (Adegbite, 2009; Kodieche, 2002; Nweke & Onyia, 2001; Ezike, 1984). As stated by Ghosh et al. (2000), part

of the reason for this is that poor farmers typically lack sufficient assets to use as security when applying for bank loans. It is possible that supply and demand interact to affect credit availability. Banks may find it extremely risky and expensive to lend money to smallholders in rural areas, which could limit the amount of credit available or force them to issue loans with high interest rates or collateral requirements. Farmers may find it hazardous to borrow money even in situations when demand-side credit is available, aside from situations in which they might not have enough collateral (Boucher et al., 2008).

Supply and demand for credit are influenced by a variety of factors including individual's personal traits, the traits of his or her neighborhood, and the traits of the loan provider (Udoh, 2005). These traits have different effects on people regardless of gender, therefore what drives one farmer's demand for credit may not have the same effect on another farmer. For instance, group members and informal lenders learn about the wealth, debt, and earning capacity of loan seekers on informal lenders and legitimate credit agencies in Madagascar (Zeller, 1994). Following a thorough examination of the entire household wealth and leverage, they rank loan requests in order of priority.

Thus, Nwaru (2004) examined the rural loan markets and resource usage in the production of arable crops in Abia State, Nigeria, using standardised regression analysis and basic analytical apparatuses to analyse his data. His findings identified a number of critical factors that impact the escalation of agricultural activities. He mentioned farm output, number of soil management practices, farming experience, and years of education, as factors that positively influenced agricultural intensification; while household size negatively influenced it. The availability of credit, including the size of the loan application, the previous loan payback history, whether or not its source of credit is official, total cost of lending, and the gross revenue of lenders. Credit demand

was significantly influenced by the interest rate, farmers' educational attainment, the size of their farm, their gross savings, and the amount they had previously borrowed. While the needs for credit from various farming households will vary, a discrepancy between supply and demand for credit is a reliable indicator of a credit constraint. A credit limitation is the result of a significant discrepancy between credit availability and demand. Hussein and Ohlmer (2008) classified households into credit constraint and un-constraint households based on their definition of credit constraint, which is the inability of a household to receive the credit it requires given the current applicable market circumstances.

Agricultural Credit Access and Productivity Linkage

According to the neo-classical theory of production, an equilibrium state can be reached by altering the labour and capital ratios in the production function (Solow & Swan, 1956). When a new technology becomes available, labor and capital must be adjusted to maintain growth equilibrium. The theory also describes how the proper ratios of labor, capital, and technology the three components that propel economic growth will be attained. Therefore, increasing agricultural output to fulfill food demand may be accomplished by wisely allocating productive resources. Theoretically, credit can reduce post-harvest waste, facilitate the adoption of new technologies, enhance efficient resource management, stabilise farm prices and revenue, and enhance efficient selling of agricultural products. As important as credit is to an economy, in an atmosphere of high optimism and expectations, excessive credit consumption could result from a lack of monitoring and prudential norms for credit control. Credit expansion will cause inflation, speculative activity, and unstable economic conditions. If there are no idle resources, changes in credit will normally have an instantaneous effect on agricultural output. Without significant harm to price stability, loan growth would increase aggregate output in the absence of constraints like productivity gaps

and technological constraints. Increasing credit typically results in higher output prices when such a limitation is in place. This is because credit utilisation restricted in this way will not be able to absorb credit expansion and convert it into higher agricultural output.

It is impossible to overestimate the role that finance plays in all economic systems, making credit an essential tool for fostering growth and progress. The need for credit among Nigerian farmers has beyond the ability of the nation's traditional banks to supply (Musa, Afolami, & Adebayo, 2014). Enya and Alimba (2008) found that the aforementioned aspect explained why a significant proportion of farmers in the agricultural sector turned to informal creditors, like moneylenders and other creditors, for credit in order to meet their financial obligations. Another obstacle to getting bank loans for farmers is their inability to provide collateral, or security, to guarantee repayment (Isiorhovoja, 2013; Awoke, 2004).

Government through CBN, established the Agricultural Credit Guarantee Scheme Fund (ACGSF) in 1977 with a 60:40 ratio. The fund had an initial investment of N100 million and paid up capital of N85 million. The Scheme was designed to promote bank lending to the agricultural sector by providing guarantee coverage for loans made to that industry. As long as the pledged collateral has been realised and applied to the account, the guarantee promises to reimburse the lending banks 75% of any amount net in the event that the borrowers default on the outstanding balance. Since its establishment in 1977, the ACGSF has undergone a number of changes all intended to increase its efficacy and the achievement of its objectives. The ACGS is credited with two notable inventions: the Interest Drawback Programme (IDP) and the Trust Fund Model (TFM). A "win-win situation" for all parties was intended by the Central Bank, which seeks to encourage lending banks and farmers to support economic growth. In addition to providing a fair borrowing rate to borrowers who can fulfill their loan repayment requirements, the policy

successfully attempted to encourage borrowers to return their loans. Musa et al. (2014) state that there is a similarity between the amount of loans that are repaid and the amount of loans that have guarantees. Sunny (2013) came to the conclusion in his empirical study on the effects of commercial bank credits on the expansion of agriculture in Nigeria that loans from the Agricultural Credit Guarantee Scheme indeed exhibit some appreciable influence on economic growth, among other things. This seems to be a direct consequence of the scheme establishment goal mentioned above. The purpose of this research is to get a deeper understanding of the ways in which loans under the Agricultural Credit Guarantee Scheme (ACGS) might promote economic growth within the agricultural industry.

Rationale behind Government Policies for Financing Agriculture

A policy is an activity that is made with the aim of influencing or accomplishing predetermined goals by the government, management (in the case of an organisation), or, better yet, just one person. The Federal Government of Nigeria (FGN) made the decision to develop policies that facilitate agricultural output's access to finance and financial infrastructure following an early recognition of the sector's significance. The accomplishment of the nation's development objectives was the ultimate purpose of this. The following justifies government action in the agriculture finance market:

To mitigate defects in the market. The agricultural financial market, sometimes referred to as the rural financial market, exists to facilitate trade and act as a check on the supply and demand of capital for the development of rural and agricultural areas. Asymmetric information, moral hazard, adverse selection, and other issues usually prevent the market from working as it should.

Subsequently, the government steps in to address these issues and give market participants a more Pareto-optimal environment, in order to assist.

Assure the security of food. It is imperative for the government to engage in direct production, farmer financing, and other related measures to ensure food affordability and accessibility. This is due to the fact that investments in agricultural output, whether made through debt or equity, require capital. It's also commonly known that providing reasonably priced food to Nigerians will improve social cohesion and reduce the nation's dependency on food imports, whose supply is always unstable due to local, national, and international political and economic conditions in addition to those in the exporting nations. Make sure the balance on your payment is positive. The financial strain of a large food import bill lowers the country's foreign reserves. This has a negative impact on the country's balance of payments as well as its reputation abroad. We only need a little shove in the correct direction from other resources, like financial capital, to raise productivity and lessen our need on food imports, even if we have an abundance of land and a climate that is favorable to farming. In order to ensure this, the government steps in and frees up foreign reserves for more advantageous uses.

Encourage a rise in the revenue from agricultural exports. With the use of government agricultural finance initiatives, first ensure food self-sufficiency before exporting the excess to earn money abroad. Government action helps to maintain foreign reserves and encourages their growth in order to improve our position in the balance of payments.

Promote other socioeconomic concerns, such as the end of poverty, the creation of jobs, the slowing down of rural-urban migration, and, above all, the stability of food prices, as it is widely recognised that changes in food prices in developing nations signal the onset of inflation. This supports Engel's Law, which maintains that in developing countries, a higher proportion of revenue

is allocated to food expenses. Furthermore, since the demand for food is quite elastic in relation to income, it makes sense why food costs are high enough to drive inflationary trends in the economy.

This supports Engel's Law, which asserts that in developing countries, a higher proportion of revenue is allocated to food expenses. Furthermore, since the demand for food is quite elastic in relation to income, it makes sense why food costs are high enough to drive inflationary trends in the economy. The farmer will gain from economies of scale, new, less expensive product discoveries, the creation of demand where none previously existed, and the supply of utilities to an expanding market. These developments will also boost the farmer's motivation and give him the courage to take risks.

Agricultural Programmes in Nigeria

The 1972-founded National Accelerated Food Production Programme (NAFPP). This was part of the Second National Development Plan (1970 - 1974). The plan itself made no clear mention of rural development, even though it was supported with N1, 353 million (FGN, 1972). It aimed to generate enough wheat, rice, corn, sorghum, and millet on its own. The Federal Government and USAID worked together on the project. Its goals are to cultivate large and intensive crops, speed up the delivery of research results to farmers, improve food production through the application of enhanced production technology packages, and create a connection between research and production organisations by providing extension services.

The Programme for Agricultural Development, 1975. In an effort to boost food production, it offers funding, farm service centers, rural roads, and agricultural extension services, among other things. It is supported by the States of Nigeria, the World Bank, and the Federal Government of Nigeria. ADPs carried out a variety of extension tasks, such as establishing demonstration farms,

identifying lead farmers, educating them about better farming techniques, facilitating lead farmers' access to new technology and inputs, and helping lead farmers in sharing their knowledge.

The 1976 version of Operation Feed the Nation. The OFN was financed with N2, 050.738 million as part of the Third National Development Plan (1975 - 1981). Unlike the previous plan, there was no defined strategy for rural development, with the exception of N500 million for rural regrouping (Olayiwola and Adeleye, 2005). Its objectives were to make the most of all the land resources in the country, boost food production dramatically, end the educated class's long-standing animosity toward it, and urge people to embrace agriculture.

The Green Revolution Initiative of 1980. The civilian government launched this programme with the goal of ending hunger by giving farmer's credit, promoting and enhancing cooperative education, encouraging the local populace to actively participate in agriculture, and utilising food and fiber research to increase the quantity of staple food production, processing, and distribution in Nigeria.

From 1977 to 1991, the Rural Banking Initiative was in place. It was recommended that banks open branches in rural areas and offer at least half of the loans and advances made from the deposits gathered there to the people living in those areas. Bank failures were supposed to result in fines.

The Community Banking Initiative ran from 1991 to 2007. The initiative made it possible to establish community banks that prioritised banking operations in rural areas. Until 2002, the CBN rather than the National Board for Community Banks (NBCB) acted as these banks' regulator. It was intended to help communities that were able to establish one by taking into account the borrower's creditworthiness, reputation, and character.

Root and Tuber Expansion Programme, Started in 2000. It was developed to improve the living conditions, monetary security, and nutritional well-being of the poorest small holder households while commercialising the production of root and tuber crops.

The National FADAMA Development Programme aimed to increase participants' earnings by a minimum of 20%. The initiative was established in 1993 with money from the World Bank to promote enhanced irrigation technology that are easy to use and reasonably priced. The Hausa term for low-lying floodplains with generally accessible shallow groundwater is FADAMA. It is a crucial instrument for achieving the government's objective of lowering rural Nigerian poverty. The FADAMA Community Association is intended to be the arrival point for the beneficiaries of the National FADAMA Development Programme. The programme gives the association the tools it needs to efficiently manage and control the resources for its own development by offering training, technical assistance, and resources. Under FADAMA's socially inclusive and participatory technique, all users will jointly create their development goals and pursue them with support. The programme is currently in its third phase as a result of its success in the States where it was implemented.

From 1997 to 2001, the Family Economic Advancement Programme (FEAP) was in operation. This was put up to provide input supply, cash loans, and capacity building to meet the family's credit needs for their regular economic activity.

Since 1999, there has been a National Poverty Eradication Programme (NAPEP). NAPEP was created by the federal government, just like FEAP. The goal of the business plan is to give farmers access to specialised, subsidised capital. The programme is divided into four schemes: The Youth Empowerment Scheme, the Rural Infrastructures Development Scheme, the Social Welfare Services Scheme (which offers social services, quality education, primary healthcare, and farmer

empowerment among other things), and the Rural Infrastructures Development Scheme (which offers transportation, communication development, electrification, portable water, and rural areas).

Microfinance as of 2005. Low-income and working-class persons who would not otherwise have access to financial services like savings, deposits, payments, transfers, microleasing, and microinsurance can now do so thanks to microfinance institutions. The Microcredit Fund offers microfinance organisations a stable source of loanable funds, while the Microfinance Policy establishes the principles and regulations governing the microfinance sector in Nigeria. It also includes possibilities for the establishment of privately owned microfinance banks with an emphasis on the open market. The Nigerian microfinance policy aims to support rural transformation, encourage synergy and mainstreaming of the informal subsector into the national financial system, expand the services offered by microfinance institutions to micro, small, and medium-sized business owners, and increase the accessibility of financial services to a sizable portion of the country's potentially productive population. Microfinance banks are classified into two categories: those that can operate as unit banks and have a capital base of \$20,000 (88,890 euros) or \$1 billion (444,500 euros), respectively, and those that can operate in a state.

The presidential initiatives aimed at financing the production and sale of specific commodities, including rice, cocoa, cassava, and oil palm.

Credit distribution by sector of preference, 1970 - 1996. Banks were mandated to allocate 40% of their loans and advances to the agricultural sector, which was deemed a favored industry. Banks that failed to meet this objective faced penalties. The funds that were not lent were acquired by the Nigerian Agricultural and Cooperative Bank (NACB), which was formerly in existence.

From 1980 to 1987, Interest Rates on Loans for Agriculture Were Lowered. Furthermore, Banks had to lend money to the agricultural sector at a controlled annual rate of 9%.

Agricultural Institutions in Nigeria

It was in 1972 that the **Nigerian Agricultural, Cooperative, and Rural Development Bank** (NACRDB) was founded. The Federal Government of Nigeria (FGN) and the Central Bank of Nigeria founded the former Nigerian Agricultural and Cooperative Bank, or NACB, to provide low-interest loans to small-holder farmers, agribusiness, and cooperatives. We offer guarantees for agricultural initiatives, rural savings services, and equity involvement in projects in addition to direct investment. Its current name was chosen following the 2002 merger of the People's Bank of Nigeria, the Family Economic Advancement Program, and the Nigerian Agricultural and Cooperative Bank. It is currently accepting deposits, however due to insufficient funding, it has not lived up to expectations.

The **River Basin Development Authority** (RBDA) was established in 1977. Nine RBDAs were established in 1977 as part of the Third National Development Plan (1975–1988) to supplement the Sokoto and Rima RBDAs that were already in place. Their primary goal is to construct water and transportation infrastructure, especially in rural areas; N32.8 billion has been set aside specifically for this reason. It was the first plan to make rural development and electrification a top government priority (FGN, 1975). The plan also planned for the considerable development of the nation's water resources in order to support year-round agricultural.

In 1979, the **National Grains Production Company** offered farmers improved seeds as compensation for raising grain yield.

The **Directorates of Foods, Roads, and Rural Infrastructure** (DFRRI) existed from 1986 until 1993. For rural development, the organization employed an integrated strategy. The philosophy recognized the link between increased food production and the development of rural

economies. Budgetary funding for DFRRRI was N433 million in 1986, N500 million in 1987, and N1 billion in 1988, in that order.

Founded in 1987, the **Nigerian Agricultural Insurance Corporation (NAIC)**. This covers every kind of farming and associated activity, including transportation-related insurance for livestock. Smallholder farmers can afford the NAIC premiums because of the CBN's significant subsidy. The indemnity paid in the event that a danger that was insured against materializes facilitates the farmer's return to work.

Nigeria's People's Bank, established in 1990. The goal of this program was to assist small and micro businesses owned by self-help organizations. In 2002, it was combined with the FEAP and the NACB to form the NACRDB.

To support agricultural productivity in more areas, the **National Agricultural Land Development Authority (NALDA)** was founded in 1991. In order to implement various plans, programs, and institutions, the government has over the years supplied budgetary contributions to agriculture that, when compared to the whole budget, fell short of fulfilling policy targets. For example, during the first to third (1962–1980) development plan years, the federal government planned \$3.57 billion, but only \$2.41 billion was actually allocated for the sector (Federal Department of Agriculture, National Development Plan, 1992). The record also showed that, although budgeted at 11.6 percent, 9.9 percent, and 7.10 percent, respectively, for agriculture, only 9.8 percent of the budget for the sector was released for the period in the first plan, 9.9 percent in the second plan, and 7.2 percent in the third plan.

Policies Governing Agricultural Financing and Rural Development

The finance plans have an impact on rural development, as have the causes of their failures or the challenges encountered in carrying out these initiatives. If the goals and objectives of these

policies, schemes, programs, measures, and institutions had been successfully attained, Nigeria could have been able to feed its people and export a sizable amount of agricultural goods at a rate that would have allowed for fast rural development. Building rural infrastructure was a component of certain agricultural finance programs, and assessments of the effects of agricultural policy on rural development were previously created. This is a result of the realization that higher food production is directly correlated with better living circumstances in rural areas that produce food. It goes without saying that there would have been instability in the domestic food supply if the highways that led to and from food hubs had been ignored. Food prices would have skyrocketed if the trucks carrying agricultural goods along these routes had been harmed or in poor shape. This would lead to inflation. As part of the integrated rural development program, the RBDAs constructed 130 dams, 1,319 boreholes, 29 wells, and 11,246 km of feeder roads between 1980 and 1983, according to Olayiwola and Adeleye (2005). They further assert that, in accordance with the Fourth National Development Plan (1981–1985), the government constructed just 30,000 km of the 60,000 km that were planned, primarily using DFRRRI, between 1986 and 1988 (FGN, 1981).

A recent study found that agricultural finance positively impacted farm income. The overall average agricultural income generated by ACGSF recipients exceeds that of non-beneficiaries (CBN, 2007a). Leverage from borrowing, which is a popular way to finance agriculture and a part of most agricultural methods, may be the cause of this higher revenue. As income levels rise, so too should the demand for things supplied by other economic sectors. Spending by consumers rises as a result, eventually increasing national income. Additional study results show that the ACGSF had a definite positive effect on employment in every state, that in seven of the thirteen states examined, beneficiaries have a technological advantage over non-beneficiaries when it comes to

business expansion and land use, that the ACGSF has a positive effect on institutional service provision, etc.

It is reasonable to assume that most of the recipients included in the sample were from rural areas given the methodology of the study. The study's conclusions can therefore be easily applied to rural areas. This implies that the benefits that have been documented have benefited rural development.

Financial Institutions Challenges in Nigeria

The alarmingly low level of financial literacy in Nigeria poses a significant obstacle to inclusive finance, making it difficult for business owners to provide banking and other financial services, especially to rural regions. Moreover, the country still lacks technology and information literacy, which makes it challenging to access financial services. Insufficient and incorrect awareness campaigns might restrict people's comprehension of financial transactions and their capacity to benefit from financial services prospects. Awareness depends on the ability to distinguish between the language of the target group and the language of education. These lead to a decline in the effectiveness of communication. According to Migap, Okwanya, and Ojeka (2015), a population lacking understanding cannot use financial services properly. According to Allen, et al., (2016), high transaction costs and annual fees brought on by inadequate institutional or physical infrastructure, as well as administrative requirements, are further barriers to financial inclusion in sub-Saharan Africa. These could restrict eligibility by keeping out prospective borrowers from unorganised or rural sectors, where official documentation of domicile, including pay stubs, is less common. But in both developed and developing countries, rural dwellers of both sexes face a number of challenges. If you visited most of the people in Nigeria's remote communities, they would appear to be in extreme poverty since many of them live in complete

despair, having little or no idea where they will get their next meal. A few intermittent bright spots amidst the dearth of roads, power, portable water, financial institutions, etc., characterise rural existence. Finding a job is difficult, and young individuals in good physical condition just sit about from dawn till sunset. Even while the majority of people accept that poverty exists in the nation, many of them still find it difficult to comprehend why, despite government efforts to address it having been successful in other economies, these efforts have failed miserably in Nigeria. In oil-rich Nigeria, many of these projects have effectively turned into ways of exhausting the limited resources of the country. Things get worse due to a lack of necessary infrastructure, and living is made harder by the high cost of goods and services. Among other factors, Marsh and MacAulay (2006) attributed the issue to a lack of capital access. They contend that the regular occurrence of market failures and their deleterious impacts on size and production are caused by a lack of financial resources. It is limited since there is a cap on the total amount of money that can be spent (Ijaiya, 2010). It has been observed that in Nigeria, a significant amount of economic activity, especially in the agricultural sector, is driven by rural populations. Regretfully, they are devoid of the essential fiscal discipline required for effective economic growth and management. The expansion and reinforcement of financial inclusion will enable them to obtain greater access to funds within the established financial system.

Challenges of Agricultural Credits Policies

Previous policies failed due to these difficulties, and they still pose a threat to current ones. Insufficient capacity to deliver services effectively. Financial institutions handled the majority of agriculture loans without the aid of qualified agricultural loan officers who understood farming and the challenges facing farmers. Moreover, the oversight of credit programs has often failed to

meet the necessary criteria. The schemes' poor payback performance is the reason they consistently fail.

The inadequate management skills of farmers' clientele. Most farmers who stand to benefit from financial policies, especially financing plans, are not proficient in basic farm management practices like maintaining records. And when these are invoked as requirements for facility access, which is always the case, they are no longer eligible.

Despite required (preferred sector) lending, exposure guarantees, and subsidized fund schemes, most traditional banks choose not to lend to the farming industry, citing lower productivity and greater risk than the non-agricultural sector.

A scarcity of money available for loans. There is not enough loanable money to undertake any large investments in agriculture; most of it comes from government sources. The government is unable to manage affairs independently. The supply and demand of finance are therefore out of balance. Statistics show that bank lending to agriculture has rarely exceeded 17% of all bank credit to the economy since records began in 1970, although accounting for more than 35% of the nation's yearly GDP (CBN, 2007b).

The absence of institutional backing for the industry. The infrastructure for processing and storing data, the legal processes for registering and completing collateral, the judicial systems for upholding loan agreements and reclaiming property, and the deficient land tenure laws are among the systems' weaknesses. This discourages the private sector from supporting agriculture finance solutions.

Public finance organizations with insufficient capital. For example, the N50 billion capital base of the NACRDB will be contributed by 60% each by the FGN and CBN. However, just about N23 billion have been paid back thus far. DFRRI and other non-bank organizations have

experienced, or continue to experience, a comparable resource shortage. A lack of funding prevents many institutions from providing services in an efficient manner.

Because of the paperwork and qualifying requirements, several of the programs, including the Agriculture Credit Support Scheme, have drawn criticism for having an excessive bias in favor of small farmers. Many of the programs available to these farmers have burdensome restrictions that rapidly become unachievable.

Farm companies with long gestation periods are not supported by most policies, with the exception of the RRF. This is somewhat disappointing since it implies that the primary agricultural exports, which are long-gestation crops like oil palm and cocoa, would not recover rapidly.

Excessive political influence in loan deals. Everyone who has any kind of connection to the corridors of power usually stands to gain the most when the government starts a credit policy. The outcome is a repayment default and a fund diversion.

Big farmers end up with the money instead of using it for other investments, defeating the government's objectives of developing rural areas, increasing agricultural output, and encouraging the adoption of new technologies. The government believes that keeping interest rates on agricultural loans low will help small farmers and promote agricultural development.

The flow of credit into areas that are not productive warps or distorts policy. For example, the River Basin Development Authority built an irrigation system in a river that is unlikely to provide the necessary amount of water for agriculture due to its irregular flow. On the other hand, the same concept can entail producing food at extremely high overhead costs. The most challenging issues are insider misuse and uneven and sporadic policy implementation.

Assessing the Impact of Financial Inclusion Strategies in Nigeria

Many people are concerned about how well Nigeria's financial inclusion initiatives are working. The conclusion is that everyone involved is held accountable because the goal of perfect financial inclusion was not reached. Among the reasons offered for the poor outcomes are low awareness campaigns, a small audience for mobile money solutions, and a lack of trust. Nguling'wa (2019) asserts that even with the favorable outlook for financial inclusion brought about by the use of financial technology, a number of problems persist. Among these are high and pervasive levels of financial illiteracy, outrageous lending rates that lead to a notable discrepancy between lending and deposit rates, low savings deposits, high non-performing loan rates, and the restricted reach of the branch banking infrastructure, especially in rural areas. Acceptance of the various types of financial inclusion remains a prerequisite for achieving this goal. Financial exclusion was a serious issue in Nigeria before to the development of digital banking, as the great majority of the country's economic output was generated outside of the banking sector. Thus, throughout the past 20 years, numerous administrations have considered the issue of financial exclusion as a crucial economic test.

The World Bank (2015) states that because involuntary exclusion can be addressed by appropriate economic programmes and policies that are intentionally created to raise income levels, reduce poverty, close the income inequality gap, and address market failures and imperfections, involuntary exclusion is now the focus of policy and research initiatives. In the past, the majority of the Nigerian economy was dependent on cash, and a sizable portion of the narrow money stock was held outside of banks (CBN, 2018, 2016, 2014, 2012; NFIS, 2012). Despite declining from 61.1% in the 1960s to 44.3% in the 1970s and then to 40.9% in the 1980s, the average ratio of currency outside the banking sector (COBs) to narrow money supply (M)

remained high in nominal terms due to the expansion of narrow money in the economy. Numerous factors have contributed to the decline in the proportion, such as rising literacy rates and government initiatives to support the expansion of the financial industry. At this point, the CBN launched rural banking initiatives and pushed banks to open branches in rural areas in an effort to get Nigerians to utilise commodities and financial institutions more often. The public's trust in the banking sector was damaged during the financial crisis of the 1990s.

Later, as a result of the political class's reckless expenditure, there was more money outside the banking system, exacerbating the issues. The share of money outside the banking system rose to 47.7% by the end of the 1990s. However, the share of money held by the informal sector significantly decreased, dropping to 38.2% at the end of 2005 as a result of the authorities' increased use of financial services. Martin and Oluba (2008) used the same measure of the ratio of currency outside the banking system to narrow money supply over a 45-year period (1960–2005) to compare the levels of financial exclusion in Switzerland, the US, Venezuela, Nigeria, Pakistan, India, and Argentina, even though each country had a different goal. They found that, in contrast, Nigeria had not done all that poorly, even though there was a need to accelerate the exclusion rate reduction. According to Omojolaibi (2017), Nigeria aimed to rank among the world's largest economies when it drew up a national blueprint called the NFIS in 2012. Nigeria's apex bank drove the initiative, warehoused it in CBN while promoting it alongside other major stakeholders, as a major economic engine. The plan was, and still remains to reduce the number of Nigerians without access to financial services from 46.3% to 20% by 2020. In Nigeria, from 36.3% in 2010 to 43% in 2012, 48.6% in 2014, with that percentage staying in place in 2016, access to financial services expanded. But from 30% in 2010 to 32.5%, 36%, and 38.3% in 2012, 2014, and 2016, respectively, the banking public grew. Between 6.3% in 2010 and 10.3% in 2016, the number of

formal financial institutions (FIs) rose. These include pension funds, insurance companies, microfinance banks, and other service providers. The informal sector's percentage, including financial cooperatives and NGOs, has declined from 17.4% in 2010 to 9.8% in 2016. Exclusion rates were greater in rural areas, especially for those with agricultural practices. The primary goal of this research is to examine how agricultural credits provided by the Bank of Agriculture (BOA), the country's top agricultural development bank, foster farmers' financial inclusion and advance the agricultural industry, economic expansion, and development of the country as a whole.

The Financial Inclusion and Economic Growth Nexus

The interplay between financial inclusion and Economic Expansion

Financial inclusion, its interconnections, potentials, and prospects to lessen poverty and injustice and boost prosperity in local projects and countries have been the subject of several academic and empirical investigations. Research has been done on its impact on attaining the Millennium Development Goals and improving rural agricultural livelihoods (Sahay et al., 2020; World Bank, 2014; Sarma, 2012). They mentioned the range of traits that define the phraseology and attempted to explain the ways in which these traits interact to generate its pluralistic nature and composition (Ozili, 2018; Park & Mercado; 2018). The financial sector contributes in two complementary methods to the fight against poverty, which improves lives (Omar & Inaba, 2020). This is achieved through its direct impact on employment and job creation, which increases the amount of disposable income available to finance other important economic initiatives. Consequently, it accelerates economic activity, which feeds economies' growth.

Evaluating the success of financial inclusion in any economy, requires measuring the breadth of coverage of the financial services needs of the population. Zulkhibri and Ghazal, (2017);

Yorulmaz, 2016, were able to reach a consensus on this matter after gathering a variety of opinions, demonstrating why financial inclusion is not only crucial but also vital for enhancing economic development, equity, and poverty alleviation. By offering the appropriate financial services, countries can effectively assist the growth of small businesses and household welfare (Barigye and Ogwel, 2019; Eton et al., 2019; and Yorulmaz, 2016). The importance of Development Finance Institutions (DFIs), which are critical to the advancement of the financial intermediation process, is bolstered by this (CGAP, 2020). Achieving this goal of financial inclusion requires the adoption of robust financial infrastructures making use of the financial infrastructure and product and or service offerings to satisfy consumer taste, and are affordable by individuals of all income levels, genders, and social strata. This is expected to help encourage the public to adopt responsible banking practices (Wokabi & Fatoki, 2019; Akhil, 2016). In Nigeria, proper financial inclusion goals and institutions must be pursued through action. This necessitates prompt and collaborative action. This will foster increased engagement and adoption of the current financial system. By doing this, more money is circulated, which raises the quantity of credit accessible for beneficial uses and ultimately accelerates the growth of the GDP.

According to Sharma (2016), inclusive finance is currently viewed as having the goal of fostering economic growth, making it a policy priority and a pillar for building a strong financial infrastructure that will support both development and growth. Economic growth is also viewed in this context from a political and social standpoint (Aina & Oluyombo, 2014; Nalini & Mariappan, 2012). Theoretically, financial inclusion positively impacts economic growth, but actual data is still lacking, especially for developing countries. There is still disagreement on whether financial inclusion should spur economic growth, even in situations where a strong connection exists. Research on causality analysis is still being done for many organisations, countries, and places to

determine any trends that may exist. New data, facts, statistics, and sophisticated analytical techniques are being used in these investigations. The direction of the causal relationship between the two points is still a contentious issue among academics due to the index's enormous potential for forecasting future political acts.

To boost prosperity and financial inclusion, the majority of developing economies worldwide strongly emphasise the necessity of updating, enhancing, and implementing an appropriate financial system. This explains why so many scholars have to go above and beyond to address the myriad of unanswered questions pertaining to the relationship between finance and growth.

Several scholars argued that it is essential to examine the subject within the framework of the well-known endogenous growth models (King & Levine, 1993; Bencivenga & Smith, 1991; Greenwood & Jovanovic, 1990). They discovered that an enhanced financial system raises productivity by stimulating prospective entrepreneurship, which in turn stimulates the adoption of methods that foster innovation and are highly likely to be successful in fostering economic growth. This was found using endogenous growth models as a framework. Bencivenga and Smith (1991) suggest that specialised financial organisations can serve as a means of promoting and facilitating more intermediation. They argue that these specialised intermediaries need to be able to finance investments with high yields and offer a variety of portfolio services that increase liquidity at minimal risk to clients. According to Levine (1997), a linear relationship exists between financial inclusion and economic outcomes. He also claimed that financial markets, instruments and agreements that reduce transaction costs, as well as knowledge acquisition targeted at accelerating capital accumulation and technological innovation, are all capable of creating wealth to sustain the growth of economies. Each of these studies confirms the hypothesis which states that financial

development contributes to economic growth. The school's originator, Schumpeter (1911), claimed that a robust credit system in the financial system would encourage R&D and innovation, which would speed up economic growth, around a century ago. Subsequent research by Gurley and Shaw (1955), Goldsmith (1969), Shaw (1973), and McKinnon (1973) corroborated his conclusions that robust economic growth requires financial development. This type of viewpoint was referred to as "supply-leading hypotheses" by Patrick (1966) in his research. Robinson (1952) asserted in his contribution that financial expansion is a part of economic development and that the financial sector will eventually grow as a rising economy's need for financial services increases. The foundation of the "demand-following hypotheses" was his position. Friedman et al. (1963) were among the first scholars to investigate the hypothesis that financial development is facilitated by economic expansion. In support of this line of reasoning, Patrick et al. (1989), Romer (1990) and Stein (1990), asserted that the emergence of modern financial institutions and services was primarily driven by the real sector of most economies' growing demand for special agencies and institutions like these to help augment the activities and services of these institutions. Empirical studies indicate a correlation or simultaneous influence between financial inclusion and economic growth (Park & Mercado, 2018, 2015; Luintel & Khan, 1999; Demetriades & Luintel, 1996; Greenwood & Jovanovic, 1990). Based on the claims made by those who support a positive finance-growth link, it has been shown that there are four main areas in which financial development stimulates economic growth. The most important is that financial inclusion enables everyone, especially those with low means, to have access to a reliable, affordable method of payment. The second covers the ways in which financial intermediation helps the economy allocate resources more fairly by boosting transaction volume and transferring resources from the surplus to the deficit sector (Hariharan & Marktanner, 2012; Khan, 2011; Odeniran & Udejaja,

2010). The third is the effect of risk management, which describes how financial systems serve as a safety net for different economic sectors by lowering the risks associated with liquidity, making it possible to finance ventures that are more creative and risky but also more profitable (Bencivenga & Smith, 1991; Greenwood & Jovanovic, 1990). Last but not least, it is known that the financial sector offers information and feedback on possible investments and capital availability within the system, guaranteeing a consistent flow of information and minimising the possibility and adverse impacts of information asymmetry. Regarding the aggregate production function, the previously discussed financial impacts significantly modify the inputs of savings and investments into further economic output, either via a channel of capital accumulation (Hicks, 1969) or a channel of technical change (Schumpeter, 1912). According to Subbarao (2009), few societies manage to make the shift from an agricultural economy to a successful post-industrial modern society without a comprehensive plan for financial inclusion. Such a document is expected to set forth how government agencies, business leaders, and the general public can work together to coordinate efforts so that all parties involved can make payments including wages, subsidies, and credit guarantee funds easily and also use electronic transfer channels to send money directly to the bank accounts of recipients. Because of the reduction in transaction costs, thefts, and leakages, corrupt activities are eradicated from society. According to Sarma and Pais (2010), an inclusive financial system contributes to a decrease in the number of predatory informal financial organisations. All economic sectors can easily access and use all available bank infrastructure to carry out their transactions with minimum stress, courtesy of mobile, digital, and Fintech. Financial inclusion lowers the cost of capital and facilitates optimal allocation of pertinent strategic assets. Sarma and Pais concluded by stating that financially inclusive systems enhance the welfare and

efficacy of the operating environment by enabling safe and secure financial operations and transactions.

Abiola, Folasade, & Alexander, 2015; examined the relationship between financial inclusion, progress of the Nigerian economy, and established the existence of the finance-growth interaction. They made it clear that the goal of the response is to improve the efficacy, caliber, and diversity of financial intermediary services. As such, its purpose should be to facilitate easy and seamless transactions while helping to address the challenges caused by knowledge asymmetry. Broad-based financial access boosts the efficacy of currency-based policy (Mbutor & Uba, 2013). The aforementioned studies (Kim et al., 2018; Cihak et al., 2016; Mehrota & Yetman, 2015; Rioja & Valev, 2004; Deidda & Fattouh, 2002) demonstrate that all financial inclusion systems that are fully equipped with expanded, functional financial services have the potential to spur economic growth. However, the outcomes from other institutions demonstrate that they yield a range of outcomes. According to research from one of those institutes, financial inclusion is not solely determined by the level of economic advancement. For example, research has shown that there is a strong relationship between a country's Better Life Index (BLI), including its degree of financial inclusion. The HDI is thought to have important connections to infrastructure and socioeconomic factors, including income, inequality, literacy, urbanisation, and physical infrastructure, among other factors related to the banking sector.

There was no clear correlation found in the research conducted by another university between growth and the financial inclusion criteria. The most well-known of them is Lucas's 1988 work, "On the Mechanics of Economic Development". This study concludes that financial development and economic expansion are incompatible. But he was able to show that capital both human and material contributes positively to economies growing. Comparable findings were also

found in the works of other scholars (Samargandi et al., 2015), Cecchetti & Kharroubi, 2012; Arcand et al., 2012).

Effective banks, in the opinion of Schumpeter (1912), foster technological innovation by identifying and assisting prospective business owners. According to economists like Robinson (1952), where "enterprise leads, finance follows," economic growth generates a need for specific kinds of financial arrangements, and the financial system automatically satisfies this demand. Financial inclusion, according to Levine (1997) and Burgess and Pande (2003), is essential to industrialisation. Financial intermediaries have had a significant impact on India's economy, as demonstrated empirically by (Carbo, Gardener, and Molyneux, 2005). Among other things, the financial sector helped to develop finance-led industrialisation and encouraged investment and total output. Research conducted by Burgess and Pande (2003) and Burgess et al. (2004) has shown that the expansion of Indian village branches was linked to non-agricultural growth and it made a substantial contribution to lowering rural poverty. The strategy has been labeled the "supply leading strategy" by some. Financial inclusion (FI) is a key goal for the governments of Nigeria and other developing countries. This is demonstrated by the federal government's 2011 disclosure of new financing sources, regulatory changes, and a growing FI policy agenda. The goal of the government is to have every person properly accounted for by 2020. With the aid of the FI strategy, the Central Bank of Nigeria's (CBN) objective of maintaining external reserves to safeguard the value of the Naira overseas is believed to be possible. It is thought that among other things, increased productivity, an increase in non-oil exports, and a stabilisation of the naira's value are all brought about by the better credit availability for micro, small, and medium-sized enterprises made possible by FI. This expression "financial inclusion" (FI) first earned popularity at the turn of the 21st century, due to the outcome of an investigation which highlighted poverty as a direct

result of financial exclusion. The goal of FI promotion is to make sure that all individuals in the community may easily access a range of competitively priced financial products and services such as transfer payments (via email and digital), operating deposit accounts, loans and advances, insurance, and pensions, just to mention a few. Under Nigeria's dual financial system, the formal and informal financial sectors coexist with little to no interaction. As of December 2011, there was supposedly N12.67 trillion outside the banking industry. According to the most recent figures, 39.2 million adult Nigerians (or 46.3% of the country's adult population of 84.7 million) were not able to receive formal or informal finance in 2012. Subsequent investigation showed that 73.8% of the excluded population was under the age of 45 (productive age), 34.0% had no formal education, 80.4% of the excluded population lived in rural areas, and 54.4% of the population was female. With 89.7 million individuals and a population of over 168 million, Nigeria has 28.6 million bank accounts (EFInA, 2012). By channelling funds from the surplus sectors to the deficit ones, the financial system stimulates economic expansion and development. Numerous studies have shown that financial development typically tends to support economic growth, lessen inequality, and end poverty (Ajakaiye, 2012). It is well acknowledged in the literature that a financial system that primarily consists of banks fosters a high level of specialisation, competency, and economies of scale. It also creates favorable conditions for the accomplishment of other government initiatives, including as balanced budgets, full employment, stable exchange rates, and non-inflationary growth. Only in an inclusive financial system is this feasible. When a greater part of the economy is outside the purview of the state, financial systems are unable to generate economic growth. The CBN's objective of preserving price and monetary stability would so become elusive.

A healthy financial system supports economic growth and acts as a basis for financial intermediation by providing savings, credit, payment, and risk management products to customers

with a variety of needs. Financially inclusive systems provide a wide range of people with simple access to financial services by providing specialised financial goods at fair pricing without onerous documentation requirements. This is especially beneficial for the underprivileged or other economically disadvantaged groups. Without financially inclusive systems, small firms would not be able to take advantage of promising growth opportunities because they will depend on their meagre earnings, and the poor would have to count on their lean resources for long-term growth. In most emerging nations, this would lead to ongoing unequal earning potential and hinder financial progress. Savings-oriented policies and initiatives are viewed as a global FI accelerator. Unfortunately, the Nigerian government does not have a plan to promote savings; most of its policies and intervention programmes are focused on improving credit, which has not yet yielded the intended results (CBN & National FI Strategy, 2012). Opening a savings account is the first step in a committed inclusion programme since it creates a formal customer relationship with the bank. More savings can be made by including the poor into the official financial system. This tiny savings group, given their size, is a possible source of financial diversity that could enhance the financial stability and economic growth of a country. However, partial financial development might hinder economic growth, especially if it gives preference to the wealthy over others (Ajakaiye, 2012).

Economic Growth and Economic Development

The words "unfolding," "growth," "the perfect aim of the attributes of a particular thing," and "bringing out the innate likelihood in a thing" come to mind when the word "development" is used in English. All of these can be linked to the idea of development, which has shaped several common policy decisions during the past 50 years, especially in the centers of industrialised

nations and around regions currently classified as less developed states in the world. This phrase combines the terms "change" and "progress" made throughout a certain project. In this case, advancement may be based on a reasonable foundation for social consciousness, which is advantageous for humanity as a whole as well as society. For a people, then, "development" refers to the process of moving from a more "advanced" state to one that is, in some respects, inferior. Understanding this process is thus the aim of development theories. Naturally, the idea of a change into a better state raises the question of precisely what we mean when we refer to "advance" or "progress." Much of the work done in the name of "international development" since around 1945 has been informed by the idea of "increasing wealth" or economic growth, which is measured in the light of increases in National income. This explanation provides a straightforward understanding of these concepts. Over the previous fifty years, national governments have grown increasingly concerned with the growth of the GDP. "Development economics" is a relatively young branch of economics that was created to explain how economic growth happens. Numerous studies have been conducted on the subject, including theoretical modeling and empirical investigation (Kenny and Williams 2001). It appears from all of the above points that growth and development have been used synonymously.

On the other hand, the notion that "development" and "economic growth" are synonymous has encountered strong resistance. Amartya Sen's is the most significant by far. He argues that the value of "commodities," the production of which is essential to economic growth, is based on what they allow us to accomplish. Sen contends that the ability of individuals to achieve the objectives they have reasonable reason to value should be used to gauge progress. He would rather that we focus on an individual's true freedom to pursue the objectives they have good cause to (Sen, 2009). This tactic inherently protects the freedoms of speech and expression, association, travel, and

resistance to unwarranted coercion. According to this perspective, growth, therefore, "can be seen as a process of expanding the realm of freedoms that people enjoy" (Sen, 1999). Reverting to the definition of development as "to realise the potential that is latent in something," we could characterise international development as the establishment of frameworks that enable individuals to reach their maximum potential or to lead fulfilling lives. Jawaharlal Nehru, the first prime minister of independent India, said something similar in the first few months of 1947. In light of the difficulties facing the young country, Nehru stated that it was essential "to give every Indian the fullest opportunity to develop himself according to his capacity". But given that "every person is to be given the fullest opportunity to develop themselves, according to their capacities," it seems reasonable to believe that most of us value life itself, good health, and at least a basic education. While these beliefs are not entirely dependent on wealth or economic advancement, they also cannot be reduced to them. By employing "human development" metrics, they are sought after. However, the concept of human society's development assumes that "traditional," primarily agrarian societies go through a process whereby pre-modern institutions (such as patrimonialism, feudalism, and patriarchy), which in various ways restrict freedoms, give way to "modern" ones designed to provide those freedoms. What constitutes the ideal institution combination is the central question at the heart of development theory. Development theories are essentially normative and teleological, emphasising the complex human process. This illustration points to a possible explanation for the lack of a single description that fully captures the numerous strands of economic advancement and growth.

Nigeria's concerns about rapid economic expansion have shaped its development goals during the past 50 years. The objectives outlined in the 1986 Structural Adjustment Programme, and the National Economic Empowerment and Development Strategy initiative (2003 - 2007), the

National Development Plans from 1962 to 1968, 1970 to 1974, 1975 to 1980, and 1981 to 1985, and the National Development Plan from 1962 to 1968. According to the Central Bank of Nigeria (2003), the system was experiencing "financial repression" prior to 1986 as a result of reserve requirement ratios, a high tax rate on financial gains, a negative real interest rate, a significant quantity of liquidity, and probable financial misallocations. After 1986, the financial markets began to influence the economy more and more. The stringent rules governing financial market instruments were gradually loosened starting in 1986, with the introduction of a Structural Adjustment Programme (SAP), which altered policy stances in 1986. The mechanism, which was expected to be a watershed in the evolution of the national economy, turned out to be an anathema. Against all odds, the Nigerian economy has continued to be fragile. In any economy, the financial sector is a growth driver, according to economic theory. The argument goes that inclusive economic growth is facilitated by the banking sector's low-cost loan extensions to the economy's productive sectors. The Nigerian economy's actual state, however, seems to indicate otherwise. The World Bank reports that Nigeria's banks' private sector credit facilities in 2013 was 12.59% of GDP. 2007 had the highest (lowest) readings of 38.35 (3.86) throughout the preceding 48 years. It was greater (lower) than the average for the preceding 48 years in South Africa, where banks' private sector credits, as a percentage of GDP was 67.38 in 2013. That figure was last reported in 2007. According to World Bank (2014), in the stock market, South Africa's turnover ratio increased from 50.7% in 2010 to 64.2% in 2011 and then dropped to 54.9% in 2012. In contrast, Nigeria's turnover ratio fell from 12.53% in 2010 to 9.21% in 2011 and then even lower to 8.79% in 2012.

The significant difference is seen when comparing trends in financial inclusion. Comparing this country to others makes it clear how shallow financial inclusion is. Nigeria frequently has

some of the most expensive bank loan availability. Nigeria's bank lending rate for adult borrowers was 26.96 per 1000 in 2013. It was 110.91 per 1000 adults in Gabon, 405.15 in Brazil, and 403.35 in Malaysia. Because of this, only 1 in 37 adults in Nigeria had access to bank credit in 2013, compared to 1 in 9 adults in Gabon, 1 in 2 adults in Brazil, and 1 in 5 adults in Malaysia. According to Soludo (2008), over 60% of the impoverished do not have access to formal financing and are consequently dependent on a small number of costly and dangerous informal services, which restricts their ability to participate fully in the markets in order to boost their income and promote economic progress. Just about two-fifths of citizens can utilize financial resources. The limited access to capital and the insufficient lending to economic agents in Nigeria, particularly the real sector that could spur economic growth, have sparked concerns about the efficacy of financial institutions in fulfilling their roles as financial intermediaries.

Economic Growth

A report by the World Bank, Global Financial Development Report 2014, reveals that economic development is the most effective strategy for lowering poverty and raising living standards in emerging nations. In addition to the first target of halving the percentage of people who live on less than \$1 per day, swift and sustained growth is also necessary to meet the Millennium Development Goals (Demirgüç-Kunt *et al.*, 2018). Country case studies and cross-country research both bolster this. In his 1955 concept of economic growth, Arthur Lewis considers human nature, defining the goal as "the growth of the output per head of population." An increase in the economy's ability to produce goods and services was his concept of economic growth. In his work, Todaro (1977) delineates economic growth as, an extension over time of economy's capacity to produce the goods and services necessary to improve the well-being of its citizens in a population that is always expanding and diversified. Over time, the economy's

potential for production is increased in order to attain higher levels of national income. While Baumol & Blinder (1988) described economic growth as occurring when an economy is able to supply more goods and services for each consumer, Miller (1991) defined economic growth as the expansion of the economy to produce more products, jobs, and money. Henderson and Poole (1991) defined economic growth as the increase in output and other indicators of material advancement at a particular point in time. Dornbusch, Rudiger, and Fischer (1995, 1993) defined economic growth as the progressive augmentation of productive capacity. Increases in capital, human resources, natural resources, and technology are all required for the production capacity to grow. Economic growth is explained by input growth, which includes labor, capital, and technological advancement.

According to the World Bank (2014), Nigeria's economy has the potential to build a system that can support rapid growth, which can reduce poverty. Furthermore, it was proposed that such growth may solve the issue of inequality while boosting Nigerians' standard of life through, among other things, good education, high-quality infrastructure, and high-quality health care. The country's economic growth over the preceding decades was averaging, according to the World Bank. This results from the ongoing cautious management of budgetary policy. Nigeria's economy is predicted to grow significantly in 2014, given that the oil sector is forecast to have shrunk by 1.3 percent in 2014 and by 13.1 percent in 2013. The World Bank also noted that the fall was caused by disturbances from the Niger Delta region, where exploration is done, as well as oil theft activities. The third quarter of 2014 saw a dramatic decline in the price of oil due to low market demand. Since oil makes up over 90% of exports and 75% of the money for the national budget. The circumstance poses a significant risk to the country's fiscal stability and external accounts. Similarly, by the end of 2014, accruable revenues to the three levels of government from the

Federation Account fell short of 6%, according to a World Bank report. This resulted in a reduction in federal funds, which had a negative impact on the wage and pension administration and payment systems in some states. The World Bank also noted that although growth has played a significant role in lowering poverty, Nigeria's rapid population increase has put the system of economic growth in jeopardy and raised poverty levels. This is not unlike from how Nigerians actually see the state of the economy, though.

Economic Development

According to Harriss (2001), the easiest way to understand these ideas is to think of development in terms of "increasing wealth" or economic growth, which is quantified by changes in GDP. This perspective has shaped a great deal of global action since 1945. Adams (2002) argues that understanding economic progress in terms of its objectives is more helpful. Adams concurred with Harriss et al. (1995) that the most common ways to discuss economic growth are in terms of the amount of money made, the number of jobs created, and improvements to the standard of living. Ever since, economic development has been seen as a process that influences the growth and reorganisation of an economy with the goal of enhancing the economic well-being of a community. Three major domains comprise, generally speaking, economic development:

- i) Governmental actions taken to achieve broad economic goals like low inflation, high employment, and sustainable growth.
- ii) Programmes and policies to offer services including creating roadways, running parks, and giving the poor access to healthcare.

iii) Policies and programmes that are specifically aimed at enhancing the business climate through initiatives in business financing, marketing, neighborhood development, business expansion, technology transfer, real estate development, and other areas.

All of these align with Edwin Brett's (2009) new synthesis, which reframes development theory to take into account additional state failures observed in some parts of the world, along with the experience of structural adjustment failure that prompted a renewed focus on the role of the state, namely macroeconomic and public sector management, as well as good governance, transparency, and accountability (World Bank, 1997, 1992, 1981). Since then, increasing a community's total economic health through the implementation of programmes that prioritise job creation, employment retention, tax base expansion, and quality of life enhancements has been the main objective of economic development. Just as there is no one definition of economic development, there is also no one strategy, plan, or initiative for achieving sustainable economic growth (Fukuyama, 2004; Harriss, 2001). Communities differ in their political and geographic strengths and weaknesses. As a result, the challenges to each town's economic growth will be unique.

Theoretical Literature

The Demand theory

The demand theory is one hypothesis that may be applied to explain the variables influencing financial inclusion. The idea states that, *ceteris paribus*, consumers will purchase fewer commodities when their prices rise because there is an inverse relationship between a commodity's price and the amount desired. *Ceteris paribus*, this negative link suggests that when prices (interest rates, transaction costs, and other fees associated with using financial services) rise, fewer people

will utilise financial services or goods. In light of this, it might be argued that widespread financial exclusion will result from individuals viewing banking services and products as pricey, especially among the underprivileged, such as those with low incomes. A useful tool for identifying the factors influencing financial inclusion is the Life Cycle Hypothesis (LCH), developed by Modigliani, Ando, and Brumberg in 1954. The LCH is commended for taking into account people's fluctuating incomes and lifelong savings habits. This hypothesis acknowledges that an individual's income and saving behaviors are dependent on their age. In their early years, people's incomes will be small, thereby enabling higher savings. They will pay off any debt they accumulated earlier in life and begin saving for retirement when their income rises in the middle of their lives. Reduced income from retirement will exhaust the resources accumulated during the intermediate stage. This implies that the process of consumption smoothing will involve financial institutions to a large extent. Providing access to banking infrastructure is essential for achieving financial inclusion. It is also based on an individual's income and age and is expected to be highest among middle-aged people as opposed to people in other life stages. Moreover, age does not necessarily determine one's level of financial inclusion in a straightforward manner.

Financial Liberalisation Theory

The primary theoretical basis for this study is the Financial Liberalisation Theory, which is backed by the Goal Setting Theory. The seminal work of McKinnon and Shaw (1973) made the Financial Liberation Theory possible. They increased the allure of thinking about a financial system with limitations on credit and regulations that warp the domestic financial markets. Based on the study, it can be concluded that a system such as this limits the economic growth of a nation because it is inefficient to distribute resources among rival customers and the intermediaries are

not equipped to mobilise savings. According to the original McKinnon and Shaw (1973) hypothesis, liberalisation (absence of repression) would raise real interest rates, which would encourage savings, which would subsequently encourage investment and, eventually, economic growth. McKinnon and Shaw argue that financial services could be made available to the poor if financial markets were liberalised. On the socioeconomic ladder, these social groups are nearly invariably located at the bottom. Giving them access to readily available financial tools could be seen as a critical step toward achieving economic growth because it allows them to expand their commercial activities. Financial inclusion may be seen as a financial framework that supports the financial liberalisation idea since it strives to liberalise financial markets in order to enhance access to capital and resources for both those at the top and bottom of the financial food chain. As a result, both groups will be able to grow their companies and improve society by stimulating the economy.

Finance-Growth Nexus Theory

The research done in 1873 by Bagehot is where the finance-growth idea first emerged. Proponents of the finance-growth theory contend that growth is positively impacted by a thriving financial sector. As per the 1911 thesis of Schumpeter, banks facilitate economic growth by providing efficient capital markets. According to Aduda and Kalunda (2012), ideas concerning the connection between finance and economic prosperity reinforce the paradigm that fiscal expansion stimulates innovation using the "supply-driven" and "demand-pull" mechanism. Moreover, the theoretical framework involves the rejection of economics as a significant factor that contributes to both slower growth and clear income inequality. Access to straightforward, secure, and reasonably priced investment sources is shown to be a prerequisite for reducing income inequality, accelerating economic growth, and reducing poverty (Serrao et al., 2013). These promote equality

of opportunity, improve budget participation for those who are socially and economically marginalised, encourage development, and shield individuals from unexpected financial shocks. The role that monetary systems play in the development of finance is a topic of theoretical dispute. Some economists think the attribute is vital, while others think it is insignificant. The mandate succeeding approach, which maintains that financial expansion is not the primary driver of the financial system's reaction, but rather growth in the economy as a whole, is upheld. Supply-side leadership proponents argue against the previous viewpoint. One may follow the history of Bagehot's (1873) thesis of finance-led growth. Supporters of the finance-led development hypothesis contend that having a strong economy is good for growth as a whole. They suggested that banks facilitate economic expansion by offering effective capital markets. Levine and Zervos (1998), among other writers, emphasised the useful function of financial institutions in promoting economic expansion. The main argument put forth by advocates of the supply-driven proposition suggests that increased demand for bank products and services will drive the financial markets forward as long as the economy expands. Thus, the growth of other economic sectors is reflected in the expansion of the financial markets.

According to Levine (2004), financial development uses five channels to simplify financial growth: pulling savings, enforcing corporate governance and overseeing businesses, generating information and allocating capital, teaching risk management, and facilitating the exchange of goods and services. In addition, each of these roles has the authority to decide how much money is invested, saved, and how the economy expands. Sheriff, Tope, 2020; Nebbio, 2004; and Levine, Zervos, 1996; are among the scholars who have emphasized the facilitative impact that the banking systems play on fiscal transformation. The Financial development theorytheory contends that limited access to financing is a major factor in both slower growth and persistent economic

inequality. This hypothesis states that Financial Sector Development possesses a "supply leading" or "demand following" framework. Therefore, income disparities and poverty must be reduced in order to promote growth and provide fair opportunities for those who are socially and economically marginalised. As a result, access to reliable, simple, and affordable sources of funding is becoming more and more acknowledged as a necessary condition. As a consequence, they are better able to become part of the market, and participate actively to its growth, and are shielded from shocks to the economy (Serrao et al., 2012). The core justification for procuring the proactive supply concept(also called the supply side theory) is that the trading markets would rise simultaneously with other economic sectors since they are driven by the increasing demand to support the growing financial needs in a booming industry. There are several studies in the literature that have offered new insights into the discussion of the precise relationship between finance and growth (Pagano, 1993; Smith, 1991; Lucas, 1988; Solow, 1956; Robinson, 1952). The controversy persists since a great deal of further research has been done worldwide so far without a conclusion. In contrast, every ground-breaking study in this field, De Gregorio and Guidotti (1995) shows that financial development and economic growth are closely related. Thus, a complete grasp of the link could be helpful in formulating astute public policies that would promote economic expansion. Patrick (1966) argued that there might be a causal relationship between economic expansion and financial advancement, or vice versa. Early economic development is more likely to be dominated by financial development, and as the economy develops, demand-following begins to take center stage. Economic growth and financial development are not causally related as growth only enhances and acts as a catalyst for the creation of financial institutions (Graff, 1999; Demetriades & Hussein, 1996). The previously proposed linear finance-growth link is refuted by these findings.

To explain financial development and economic growth, four conflicting theories that have shown promise in experiments are commonly invoked. Nyasha and Odhiambo (2015) claims the nonexistence in nature of a causal connection linking monetary expansion to increased productivity in their fourth viewpoint. It is called the bidirectional causality view. The supply-leading hypothesis states that finance industry expansion is required for economic growth (Bayar, Kaya, & Yildirim, 2014). The demand-following hypothesis states that financial commodities are in high demand due to the expansion of the economy (Onwumere et al., 2012). Unlike the bi-directional causation perspective, which contends that one actor leads to another link in both directions. The fourth perspective says no association can be found at all among commercial success and increased productivity.

The study's theoretical framework, the finance-growth theory, was chosen because of its adaptability and relevance to the changing global economic environment. The hypothesis states that the inability to get funds has a key role in the persistence of economic disparity and the rate of advancement. The idea that having access to a simple, safe, and inexpensive source of finance is essential to accelerating economic growth and reducing poverty and income inequality both of which limit opportunities is gaining traction. Socially and economically disadvantaged people can benefit from increased economic integration, active participation in development, self-defense, and to mitigate economic instability (Serrao, Sequeira, & Varambally, 2013).

Theoretical framework

This part evaluates the origins of social economic participation in history, the awareness-raising that resulted from the numerous risks associated with financial exclusion, and the early stages of the movement that eventually gave rise to a social struggle for the advancement of the financial system and a full-fledged movement for the political and socioeconomic emancipation

of societies. This section concludes with a summary of the theories and concepts that served as the foundation for developing the project's financial systems. According to a study by Tomilova and Dashi for the Consultative Group to Assist the Poor's 2019 Funder Survey, disparities in financial access and usage persist, especially in developing countries, even in the face of the world economy's fast economic expansion and modernisation.

While admitting that the current state of affairs progressively resulted from developing a precarious financial foundation, Ozilli (2018) recommends that governments apply the lessons acquired from past acts to find solutions for the present and future issues faced by financial exclusion. He says there is no denying that the ways that financial exclusion manifests itself in the modern day are different from how it was in the past. Most societies could not fully engage since regular banking services and products were unavailable (Kempson & Whyley, 1999; Leyshon & Thrift, 1993).

While acknowledging labour and capital, institutions as variables for economic growth, earlier theories of economic development and growth generally ignored the importance of finance for economic growth. The efficient market theory and the Modgillani-Miller theorem are to blame for this. Both theories made the assumption that the market is flawless or that the capital market is faultless. According to the assumption, investors can easily purchase and sell shares in a perfect capital market environment without having to pay any transaction costs. In the real world, companies and individual investors cannot borrow and lend money at the same rate. Early theories of economic expansion did, however, also reinforce the need for a large and intricate financial system that could tap into savings and utilise the funds to fund a variety of commercial endeavors. Research on the connection between finance and economic growth is scarce. However, contemporary theories of development contend that financial development is vital because it

stimulates economic growth either through a "supply-leading" (growth, as stimulated by financial development), or "demand-following", being growth that is stimulated by a need for financial products) channel. Kakwani, Pernia in 2000, demonstrated that continuation in income disparity and reduced pace in the rate of economic growth are largely caused by the lack of access to funding. A large body of empirical financial literature suggests that increasing credit availability and the banking sector's growth could accelerate economic growth while also lowering income inequality and poverty.

In an underdeveloped financial system, where funds are scarcer and more expensive, fewer economic activity could be sustained, which would restrict the ensuing economic expansion. Low-income groups find it difficult to get the money they need to pay for other essentials and their consumption from the industrialised banking institutions. Traditional financial institutions usually do not accept the poor since they do not have the appropriate securities for the purpose (World Bank, 2002). Because of this, as was already said, they are forced to employ expensive informal resources like moneylenders, which concentrates the benefits of expansion in the hands of those who have accessed the services provided by banks and financial institutions (RBI, 2008). In contrast to 87% of marginal farmers and landless labourers who are reported to not have access to formal credit, 66% of large farmers in India are believed to have a deposit account and 44% to have access to credit, according to World Bank NCAER (2004). Thus, low-income individuals and small enterprises are forced to rely entirely on their own limited savings and incomes in order to pursue education and entrepreneurship as well as growth opportunities (World Bank, 2008b). Thus, the impoverished and vulnerable populations need to have access to safe, simple, and affordable commercial credit products and services to cultivate a thriving economy which will in

turn stimulate fiscal prosperity and lower the disparity in income inequality and penury, especially in underserved areas and lagging industries (Kakwani, 2000; RBI, 2008).

Because only official credit agencies can service household credit demand at a sufficient level, swiftly and inexpensively, financial inclusion requires a well-established and equally distributed banking sector (Chikara & Kodan, 2011). A stable financial system, which supports equality of opportunity, helps the economically and socially marginalised to better integrate into society, actively contribute to its advancement, and shield them from shocks to the economy, is another factor that contributes to the equitable distribution of the benefits of economic growth (World Bank, 2008a; RBI, 2008). The tight link between the rural and overall national financial markets allows rural residents to participate in investments outside of the rural sector by mitigating seasonal, sectoral fluctuations in future access to and use of credit (Moll, 1989). Financing options for rural areas may stimulate innovative business ventures and technical development. Globally, more than two billion people are excluded from using basic financial tools, and the circumstance is far more severe in the majority of the economically vulnerable countries, where the vast majority, over 90% of the population, is excluded from traditional banking services. For the purpose of attaining a more rapid pace of economic expansion and a fair allocation of the advantages of this expansion, increasing people's accessibility to financial resources ought to be a top goal. As a result of the several factors enunciated above, Ozilli, 2018, postulated the following notions,

Theory of financial Inclusion Beneficiary

Those who benefits from the consequences of financial inclusion is explained by the hypothesis. However, other academics disagree (Ghosh & Vinod, 2017; Demircuc-Kunt et al., 2013; Swamy, 2014; Mehrotra & Yetman, 2015; Kim et al., 2018; Ozili, 2018). Studies have

shown that the poor benefit more from financial inclusion (Bhandari, 2018). Beneficiaries have also included other groups, including the young and old, sick and institutionalised persons, the disabled, and those who have already been kicked out of the financial industry. Four theories were proposed as a result of these ideas to explain who gains from financial inclusion. They include:

Everyone should have unfettered access to and use of formal financial infrastructure. This position is known as the public interest theory of financial inclusion.

To contend with the negative emotional and psychological experiences related to financial circumstances, we have “the financial dissatisfaction model”. According to the dissatisfaction hypothesis, all people who had previously been enrolled in the formal financial system but had left because they were unhappy with the public banks' rules of engagement should be the initial target group for financial inclusion initiatives and programmes in any nation.

The idea of financial inclusion for underprivileged groups. This perspective holds that a country's financial inclusion policies and programmes should give top priority to assisting its most vulnerable citizens, including the impoverished, children, women, and the elderly, who bear the brunt of both natural disasters and economic distress.

According to the systems theory of financial inclusion, the financial, social, and economic subsystems of the current system contribute to financial inclusion. According to the theory, which contends that financial inclusion would improve their functionality, the success of a financial inclusion agenda will depend on how well-functioning the supporting sub-systems are. According to the systems theory perspective, whether they be economic, financial, or social sub-systems, financial inclusion ultimately helps them all. The hypothesis holds that the mechanisms that underpin financial inclusion have a direct impact on its outcomes. To better understand the

connections between the problems with the current financial system and the creation of specific structures that served as a means of reducing broad financial exclusion.

Theory of Financial Inclusion Delivery

According to this theory, different people have different opinions about who should provide financial services to the general public. According to some (Aggarwal & Klapper, 2013; Staschen & Nelson, 2013; Chibba, 2009), the government must assist the populace in achieving financial inclusion. Some argue that the responsibility should lie with private businesses such as banks, financial institutions, and fintech companies (Ozili, 2018; Gabor & Brooks, 2017). Certain theories suggest that the public and private sectors could collaborate to foster financial inclusion (Arun & Kamath, 2015; Pearce, 2011).

Theory of Active or Supply Leading Financial Development

This theory holds that giving people access to all available financial tools is the best way to extend financial opportunities to all, and thereby combat financial marginalization. As long as financial systems are able to legitimately meet people's needs, they will begin to receive additional economic entitlements, and this economic empowerment of the general public will eventually promote financial progress. Branch banks were first introduced in India and many other emerging economies throughout the world as a result of this need and the application of this concept (Ozili, 2017; Kumar, 2011).

Demand following financial development Theory

This thesis holds that economic expansion and human economic empowerment are related to financial development. It argues that when people actively participate in economic activities

that generate income and employment, demand for a range of financial commodities arises. This demand for financial goods will encourage the development of financial intuitions. Because of the focus on demand, this approach is now referred to as the Demand Following Financial Development. One of the best examples of how people are forced to look for credit from any source at all is the swift growth of unofficial financial organisations in rural areas.

Theory of Intertwining Financial Development

This theory refutes the assertion that money or economic advancement comes first. The theory suggests that financial and economic advancement may occasionally go hand in hand. This makes it difficult to determine when the process starts and ends. It is feasible in both ways. Ozili (2020) proposed the following sets of theories to provide logical explanations for the objectives and outcomes of financial inclusion.

Community Echelon Theory of Financial Inclusion

The community echelon hypothesis states that the population who is financially excluded should gain financial inclusion through their communal leaders.

Public Service Theory of Financial Inclusion

Theory of public service financial inclusion thesis holds that governments have an obligation to advance financial inclusion for the benefit of their constituents. According to the idea, public entities should provide financial inclusion services to all resident

Special Agent Theory of Financial Inclusion

The special agent theory of financial inclusion states that complex issues and technical aspects pertaining to the community's location, culture, or population may make it challenging to give financial inclusion to the excluded. Members of the excluded communities must receive financial inclusion from specialised agents. This idea proposes a connection of some kind between the major agents and the special agents. The national government, foreign governments, or foreign organisations are usually the principals, and the local bank, non-bank institution, or other special institutions created specifically to accomplish financial inclusion are usually the special agents.

Collaborative Intervention Theory

The collaborative intervention principle states that various stakeholders should work together in a coordinated manner to achieve the objective of universal financial access. It is thought that bringing the marginalized into the fold of formal financial services would require cooperation from several parties.

Financial Literacy Theory

The concept of financial inclusion, with its focus on financial education, asserts that education should be used to raise the financial literacy of the populace. This idea states that people are more inclined to interact with the official financial system if they are financially educated. Opponents of the notion contend that involvement in the formal financial sector takes "willingness" into account rather than "capacity." This implies that people lacking adequate financial resources, or "capacity," are unable to effectively participate in the financial system, even if they acquire financial literacy.

Theory of Financial Inclusion Funding

Who should be in charge of initiatives to encourage financial inclusion for the general public? This has grown as an important topic. Some people believe that taxpayers should pay for financial inclusion initiatives and services (Marshall, 2004). Some argue that because private-sector capitalists contribute to the growing wealth disparity between the affluent and the impoverished, they should be supportive of financial inclusion (Mohiuddin, 2015; Spackman, 2002). According to El-Zoghbi et al. (2011), the majority of funds allocated to financial inclusion initiatives across various countries come from cross-border funding, with a substantial portion of these funds going to microfinance institutions. Several theories propose that to finance projects, the public and private sectors should collaborate (Cobb et al., 2016; Dashi et al., 2013). There are still others who maintain that initiatives and policies about financial inclusion might benefit from targeted funding interventions from both related and unrelated parties, including private citizens, international governments, and nonprofits.

Contemporary Theory of Financial Inclusion

Financial exclusion, according to Ozili (2020) and Kumar (2011), is caused by problems with technology, the financial crisis, and market-driven incentives; the fundamental causes of this exclusion include a lack of assets, income, etc. This category encompasses the following three hypotheses.

Free Market Model

This model, also called the "Shareholder Wealth Maximisation Model," explains the macro-level process of financial exclusion. Based on the notion that there is only one cure for all economic ailments, the "Market" is the foundation of this paradigm. According to certain theories, a market economy with less restriction from the government naturally tends to become closer to the "Pareto Optimum." Policies imposed by the government will deflect economies from attaining growth and the eradication of all imbalances. In a financial system that is deregulated, financial institutions use the stock market to raise capital for their operations. Most of the leading financial and banking institutions have begun to offer their shares on the stock exchange. Due to the government's decision to shift its policy in favor of disinvestment, nationalised commercial banks in India are now swarming the capital market to seek capital, joining the new generation of banks. In actuality, the financial sector has been deregulated since neoliberal policies were implemented in India, which has exacerbated financial exclusion (Chavan, 2008).

Financial exclusion is influenced by increased competition brought about by deregulation and globalisation. The "Shareholder Wealth Maximisation Model (SWMM)," as this model is technically called, explains how financial exclusion functions on a broad scale. Based on the notion that there is only one cure for all economic ailments, the "Market" is the foundation of this paradigm. According to this argument, a deregulated economy is predisposed to converge toward the "Pareto Optimum." The economy will be distracted from attaining growth and the eradication of all imbalances by government involvement through policy. In a deregulated financial environment, financial institutions participate in the stock market to raise capital for their operations, which ineluctably leads to the creation of financial products. The argument that the goal of financial liberalisation should have been financial inclusion rather than exclusion is

predicated on the notion that strategies driven by the market inevitably lead to the creation of financial goods.

However, banks are being forced to focus more on specific customer groups than on all customers due to the risks associated with lending, the requirement to maintain capital adequacy standards, and mounting pressure to be more productive and efficient. This has the effect of financially excluding less valuable customer groups. In the context of SWM, the value produced will be significantly boosted even if consumers who are less fortunate or valued are excluded in favour of those who are more valuable. This seems to be the strategy used by most private banks and deposit money organisations. Boyce (2000) provides the following summary of the process: "Customer valuation is shown to have become a means to increase shareholder income and wealth, almost inevitable at the cost of further marginalising the poor and disadvantaged." In fact, the liberalisation of the banking industry exacerbated India's banking exclusion (Chavan, 2008). Financial exclusion appears to be caused by increased competition brought about by deregulation and globalisation. The global banking industry has been undergoing a "strategic shift" due to the financial institutions' emphasis on "valuable customers" in an attempt to boost their "value addition."

Theory of Asymmetric Information

According to Stiglitz and Grossman (1980), one of the market's "failures" is that it is unable to provide all players with thorough information about the sellers, the products being offered, and the conditions of the deals. This is related to the information economy's rise to prominence as a whole new economic structure and the expansion of its economic power. According to Levchenko

& Ostapenko (2016), the traditional factors of production land, labor, capital, and entrepreneurial skills along with information resources, comprise the modern economy.

Asymmetric information, which is fundamental to financial markets and influences information flow and economic dynamics, must be understood in order to understand the structure and functioning of economic systems in general and price discovery in particular (Greenwald, Bruce & Stiglitz, 2007; Stiglitz, 2004, 2003, 2000). The non-bank financial services subsector's information asymmetry explains market imperfections and inefficiencies. Moreover, the hypothesis states that gaps in supplier and buyer knowledge can and will lead to market failures. Economists claim that in such cases, the forces of supply and demand, which combine to determine the value of commodities, ineffectively distribute goods and services in a free market. Information asymmetry is proposed to help skew pricing of goods and services in favor of sellers while simultaneously allowing low- and high-quality products to fetch the same price given the buyer's lack of knowledge (Spence, 1973; Akerlof, 1970; Arrow, 1963).

Modern Development Theory

Burr created modern development theory in 1958. It is a synthesis of several points of view about how to successfully implement desired social transformation. Modernisation theory, which examines the mechanisms that could result in modernisation in a society, served as the foundation for the idea. The concept looked at the aspects of the economy that can encourage growth as well as those that can operate as roadblocks. They argue that the primary focus of financial inclusion in rural communities should be development funding focused towards those particular locations that can aid in the modernisation of traditional or backward societies. The idea's foundation is development theory's earliest theories, which maintained that people could change and mold their

own communities. This implies that people's ability to forge their own growth paths must primarily come from within.

Pecking Order Theory

Donaldson first proposed the pecking order theory in 1961. It was later modified by Myers and Majluf (1984), and Matemilola and Bany-Ariffin (2011) popularised it. Arising from the concept information failure, the Pecking Order theory states that a corporation will always favor internal resources over external resources and debt over equity, regardless of the amount of debt it may be carrying at any given time. Businesses prefer internal finance when it is available, and if external financing is required, debt is preferred over equity (Myers & Majluf, 1984). A preference hierarchy for funds used to finance enterprises is specified by the idea. Businesses will always favor debt over equity, short-term debt, and retained earnings over equity as long as there is a communication gap with potential investors.

Inclusive Growth Theory

This perspective holds that inclusive economic growth can only occur when all of the weaker sectors of society such as small-scale and agriculture industries are given support and raised to the same level of economic development as other societal sectors. Creating inclusive growth is the primary problem facing development. Development economists have always been interested about the connection between financial inclusion and economic prosperity, especially during “Washington Consensus era”, spanning from from the late 20th century to the dawn of the new millenium. It is thought that a growing gross domestic product (GDP) indicates that a society is organising itself collectively for progress. As a civilisation's economy grows, it becomes more cohesive and well-organised. Therefore, continuous high growth that is inclusive is preferable for

everyone, and prolonged high growth is preferred. Policies for equitable growth must be a part of most government strategies for sustainable growth. Inclusion is a crucial component of every growth strategy that works (Commission on Growth and Development, 2008).

Empirical Literature

Several research works have considered the relationships that exist among specific financial inclusion variables and financial sector institutions, as well as the relationships that are related to economic growth, inclusive finance, and financing or credit for agriculture. None, however, have taken into account the possible influence of Nigeria's largest agricultural financing institution, the Bank of Agriculture (BOA). Consequently, the literature on these subjects is examined in this dissertation under the following headings: -

Financial Inclusion, Economic Growth, and Causality Studies

While many scholars continue to argue that there exists a direct correlation between inclusive finance and economic growth, there are many who disagree. The former's proponents contend that opening an official account in the first place is all that is needed to establish a safe space for the growth of reliable payment relationships, which in turn opens up a variety of channels for transactions, including formal credit access. They claim that these are necessary elements to initiate investment and commerce. This position is supported by an IMF Report (2023). While discussing the potential services that are necessary to promote financial inclusion, the report stressed the importance of advancing digital financial education, and infrastructure, among areas beyond urban centres, especially underserved village communities, to support the expansion of technology solutions. More importantly, it emphasized the crucial role of a multi-faceted approach,

including the use of innovative fintech solutions. The data that follows outlines the conclusions of the investigation that the protagonist of this school carried out:

In their research work, Shiro, Abija, and Fadun (2023), explored the relationship between non-oil exports and Its Effects on Economic Growth in Nigeria (1981-2020). By investigating the impact of diversified trade on Nigeria's fiscal growth covering the period from 1981 to 2020, the researchers found that non-oil exports, oil exports, and exchange rates have no considerable influence on Nigeria's gross productivity. However, the study discovered a lasting association between the variables. Although the exact methodology used in the study is not explicitly stated, similar studies on the topic have employed techniques such as the autoregressive distributed Lag (ARDL) bound test and CUSUM stability test. Another study used the ARDL technique.

Agya; Ojiya, Emmanuel and Hilary (2022), delved into the impact of financial inclusion on Nigeria's economic growth, leveraging annual time series data from 1980 to 2019 and employing the ARDL method. The research reveals a long-term relationship between key economic indicators, including RGDP, Human Capital Development Index, investment, inflation rate, exchange rate, and financial inclusion index. Notably, the study finds that financial inclusion, human capital, and investment have a significant positive impact on economic growth in both the short and long term.

The research found that Financial Inclusion contributes 11.5% to Nigeria's economic growth, making it the most impactful factor; Again the study observed that Human Capital and Investment positively impact economic growth in both the short and long term. On Exchange Rate they found that it positively impacts economic growth in the long term, but negatively in the short term. Furthermore, they found Inflation negatively impacting economic growth in the long term, with an insignificant effect in the short term. As a consequence, the research advised

Government to prioritize increasing financial inclusion rates in the country, and Financial institutions to remove unnecessary bureaucracies and restrictions on access to finance.

Government should also ensure stable price levels for consumer and investment goods, as well as a stable local currency, to attract local and foreign investors

Focusing on the many Poverty Reduction Targets of the United Nations, Thathsarani, Wei, & Samaraweera (2021), while noting that inclusive finance has become a prime concern and is an item on the agendas of most governments in emerging countries, decided to investigate ways of curbing financial exclusion. They rightly observed that the process of supporting banking and financial services for individuals is called financial inclusion, which promotes growth and a comprehensive economic development strategy of economies. They also observed that although economic growth and Intellectual capital enhancement indices have been evaluated using different stand-in variables, no appreciable interest has been generated towards establishing a hybrid benchmark for appraising this to attain increased resilience in terms of the trade, commerce, prosperity, the society, and the ecosystems. Their research therefore, focused on addressing the chasm using published data from eight countries in South Asia from 2004 to 2018. A financial inclusion index was developed through principal component analysis. This study employs an econometric approach using panel data, vector error correction models, and a Granger causality test. The findings reveal that financial inclusion has a long-run impact on intellectual capital growth in South Asian countries, while also exerting a short-run positive influence on economic growth. Furthermore, local lending to the private sector affects short-run growth and intellectual capital development. By fostering confidence among vulnerable communities and enhancing information management, financial inclusion enables quality transactions with reduced environmental impacts. To accelerate the achievement of sustainable development goals in South

Asian countries, government interventions aimed at improving access to financial services - such as ATMs and commercial banking - play a crucial role in leveraging digital finance.

Adedokun and Aga (2020) conducted an investigation into the relationship between financial inclusion and economic advancement in sub-Saharan Africa (SSA) spanning the period from 2004 to 2017, employing the generalized method of moments and Dumitrescu-Hurlin causality tests. Given the heterogeneous nature of the financial inclusion process, a principal component analysis was utilized to construct a composite financial inclusion index. The study's findings revealed that financial inclusion had a positive impact on the economy of sub-Saharan Africa. Another study discovered a direct causal relationship between financial inclusion and short-term economic growth. To promote inclusive growth across the continent, the primary emphasis of this discussion should be on formulating policies that facilitate access to and utilization of efficient, high-quality financial services and products.

In the study by Machdar (2020), time series data and Ordinary Least Square (OLS) regression model were used to examine the relationship between financial inclusion, financial system stability and sustainable economic growth for Indonesian banking enterprises. The study's parameters included the share market value, total assets, earnings before interest and taxes, retained earnings, and the bank's score index. It was demonstrated that the soundness of the financial system and financial inclusion have little bearing on the sustainability of economic growth in Indonesian banking enterprises.

Abubakar, Daneji, Mohammed, and Chekene (2020), used methodological convergence or literature triangulation to extract workable alternatives presented at discussion panels with practical knowledge of worst-indicated geo-political zones in Nigeria, explored alternative strategies to accelerate financial inclusion in developing countries. The researchers note that

despite efforts to promote financial inclusion, many developing nations still have high exclusion rates. The study identified financial exclusion as a significant barrier to development in developing nations. They say that the "Refreshed strategy" employed by many developing nations, including Nigeria, has been ineffective in driving financial inclusion. As a result, they recommend the "push strategy" that reorients the mindset of the excluded as a better solution to drive faster financial inclusion. The study recommends a faster inclusion rate, at least faster than the rate of population growth. They say it would produce a better financial inclusion index and truly accelerate economic growth.

Joseph (2020) examines how financial inclusion affected inclusive growth in Nigeria from 1981 to 2017. The study took into account the number of bank branches, GDP per capita, money supply to GDP ratio, private sector credit to GDP ratio, and rural loans. Furthermore, the Autoregressive Distributed Lag (ARDL) model was employed to supplement the analysis. The study's findings reveal that financial inclusion, manifested through rural loans, bank branch density, and liquidity, exerts a positive and significant influence on inclusive growth, both in the short and long terms. Conversely, interest rates were found to hinder inclusive growth. To boost rural inhabitants' engagement and their contribution to the country's production, the research suggests providing them and the economy at large with greater and better financial services

Charles-Anyagwu (2020) investigated the effect of access to financial services on output in Nigeria. Time series data from the Central Bank of Nigeria statistical bulletin for the period of 1992 to 2018, was utilized in his analysis. The Co-integration, Causality, Unit Root, and the Ordinary Least Square tests were used for the analyses. The Causality test result shows a unidirectional causality flowing from Microfinance Bank Deposit to the Output, whereas a unidirectional causality existed between Loan and Advances and Output, with causality flowing

from Output to loans and Advances. The unit root test reveals that all variables become stationary after first differencing. Besides, Output recorded a significant positive relationship with Bank Deposit but an insignificant relationship with Loan and Advances. Nevertheless, a long-run equilibrium relationship exists among the variables. In other words, the short-run effects were sustained over the long term in the case of Bank Demand Deposit and Output. It goes on to show that the effect of loans and Advances on Output is best felt in the long run when companies that acquired the loan must have produced goods and services at the national level. In the light of these findings, it is recommended that Central Bank Nigeria and Commercial Banks encourage financial inclusion since it has proven to have a great influence on the output. Also, Banking Services when extended to the remote areas, will not only reduce financial exclusion but will enhance the output in the economy.

Riyanto et al (2020) examined the effect of inclusive finance on disparity in income levels, economic expansion, and poverty alleviation initiatives in the easternmost part of Indonesia. The study used both the Toda-Yamatoto VAR bivariate causality model and Dynamic Panel Vector Auto-regression (PVAR). The results of the bivariate causality analysis indicated a strong correlation between income distribution, financial inclusion, economic progress, and the decrease of poverty in Eastern Indonesia. They discovered, however, that although financial inclusion was enhanced by economic progress, poverty was negatively impacted. The substantial positive effect of financial inclusion on inequality served as evidence of the pervasiveness of economic inequality in Eastern Indonesia.

Time series data was utilised by Datta and Singh (2019) to assess the state of universal financial access in several high-income and low-income economies worldwide. Using the target population between the ages of 15 and 64, enrollment in lower secondary education, life

expectancy, and the urban population were among the study's variables. Using pooled OLS and Principal Component Analysis (PCA), the analysis found that PCGNI, population, education, and life expectancy, together with area dummies, all have the predicted positive sign and are significant. The main problem with the paper is estimating pooling OLS in time series data.

Chu (2019) investigates the variables influencing financial inclusion in high, middle, and low-income nations using cross-sectional data. Among the variables in the study are gender, age, age squared, education, occupation, and income utilising the logit model, the study found that being a man, having a higher level of education, being rich, having a job, and being older up to a specific age all increased the likelihood of utilising formal financial services. For the three country sub-groups, the effects of income and education on the likelihood of formal borrowing and saving are greatest in advanced and emerging economies but lowest in the less economically developed economies. The rankings were the opposite for formal accounts and payments. The magnitude of the effects increases with each nation subgroup's income and educational attainment for all formal financial inclusion indicators.

Lei et al. (2019) investigated the main determinants influencing financial inclusion in Asian countries using a random effects model. Among the factors utilised in the analysis are GDP, literacy, income, unemployment, inflation, network, interest rate, geography, and Islamic banking. According to the study, countries with faster economic development and greater incomes also had notably higher financial inclusion indices. Financial inclusion improves when literacy levels rise because more literate people are more eager to use financial services responsibly and are more aware of their benefits and drawbacks.

In order to investigate the various facets of financial inclusion in Zimbabwe, Ngoma (2019) used a binary logit model to analyse the variables account ownership, saving, borrowing,

mobile money accounts, income, employment, education, and gender. The impact of individual characteristics such as age, income, gender, education, and work position on financial inclusion in Zimbabwe was determined by this study. Furthermore, this survey discovered that the majority's distrust of financial institutions was a big factor in their lack of banking.

Elsayed and Elatroush (2019) used cross-sectional data to investigate the most important obstacles responsible to accessing and use of banking series. The study used samples taken from 21 middle-income nations. The percentage of savings in financial institutions, commercial bank branches, ATMs, financial institution accounts, loans to start or operate a business, loans for education, and lastly loans to operate or expand a business were among the study's variables. The inquiry included two-stage least squares and principal component analysis. The primary shortcoming of the report is its incapacity to clearly show and summarise the main findings of the inquiry.

In contrast, Usman Adigun (2019) investigated the relationship between financial inclusion and currency availability in Nigeria from 1981 to 2016. The study's model incorporated various variables, including the number of automated teller machines for every 100,000 individuals, total bank branches, total loans disbursed by rural banks, and total deposits made by rural banks. Utilizing multiple regression and error correction methodologies, the study revealed that the quantity of currency in circulation exhibited a significant positive correlation with several variables, including the number of bank branches, Automated Teller Machines for every 100,000 adults, total credit extended to individuals, total loans issued by rural banks, and total deposits, and the total amount of loans extended to businesses ($t=4.651$, $p=0.001$). It has been recommended that the Central Bank of Nigeria (CBN) employ market-based interest rates in its financial policies

to foster an atmosphere that is conducive to investment. Investments will be encouraged by this, which will surely impact the money supply and ultimately raise the level of financial inclusion.

Ong'eta (2019) established the standards for evaluating access to and use of banking services. Findings from the study revealed that the accessibility and usability of financial services are influenced by both supply and demand-related factors. Demand-related factors include household or individual income, education, and collateral, involvement in work guarantee programmes, income inequality, age, financial literacy, savings, and gender. Supply-related factors, including high interest rates (cheap loans), innovation (agent banking and mobile banking), ICT, bank branches, and financial product sensitization, play a significant role in determining financial inclusion. The analysis's findings were applied without a methodology or variable specification.

Dandibi, Wurim, and Umaru (2019) examined the effects that inclusive finance and financial literacy have on the operations of agribusinesses, particularly, micro, small and medium scale agricultural activities in Yobe State, Nigeria, using cross-sectional data and 315 questionnaires. The Ordinary Least Square (OLS) model and components such as accessibility, availability, usability, and financial literacy were employed in the study. The results showed that the success of agro-based SMEs in Yobe State is significantly impacted by the availability, affordability, while leveraging banking services. Furthermore, the relationship between the performance of agro-based SMEs and the availability of financial services was found to be entirely mediated through financial education, whereas the interaction between accessibility and consideration for procurement of financial services and performance, is only partially mediated.

A study by Barigye and Ogwel (2019) investigated the link between access to financial services and growth of National income in Uganda, focusing on selected districts in Western

Uganda. The study aimed to examine whether expanding financial access to financial services contributed to economic prosperity increased access to financial services contributed to economic growth in the region. The researchers employed a case study approach, collecting data from 300 respondents in five districts of Western Uganda. They used descriptive statistics and regression analysis to investigate the correlation between financial inclusion and economic growth. Financial inclusion was positively associated with economic growth in Western Uganda. The study showed that increased access to financial products, like savings accounts, loans, and mobile banking, contributed to improved economic outcomes, including increased income, employment, and investment. However, the study also identified some challenges to financial inclusion in the region, including limited financial infrastructure, high transaction costs, and low financial literacy. The authors recommended that policymakers and financial institutions should implement measures to address these challenges, such as investing in financial infrastructure, reducing transaction costs, and promoting financial education.

Camillus, Nwoko, Elugom, & Uche, (2019), utilised yearly time series statistics from the CBN Statistical Bulletin collected over a number of years to assess the connection between financial inclusion and the growth of Nigeria's agricultural output growth (AOG). The data were examined using the Granger Causality Tests, the Vector error - Correction Model approach, the Unit Root Test, and the Engle Granger Co-Integration Test. Indicators of financial inclusion included the prime lending rate, deposit rate, guaranteed agricultural credits, and demand for deposits from rural areas, and deposits of bank loans to small-scale businesses as a percentage of total loans. According to the results, financial inclusion accounted for just 41% of the fluctuations in the agricultural sector's output in Nigeria. This demonstrated that the explanatory factors had very little effect on the dependent variable. Stronger proof that there is no causal relationship

between the dependent and explanatory variables was offered by the Granger Causality Test. Consequently, the study recommended that the significance of their reciprocal complementarity be communicated to agricultural and financial enterprises. Rather than depending on unorganised or conventional financial institutions, the agriculture sector ought to depend on their offerings. Financial institutions should concentrate on supporting the farm sector.

Wakdok (2018) examined the interrelationship between access to and use of financial services by Nigerians and the expansion of the country's economy. The scholar used the finance-growth theoretical framework. To do the econometric and assess the hypothesis, secondary sources provided data covering the period 1990 through 2014. The study concluded, through empirical analysis, that financial inclusion, through financial deepening variables such as broad money, loan deposits to the rural area, and liquidity ratio of commercial banks, were found to be positive and significantly affect the economic prosperity of the Nigerian state. Consequently, it was recommended that lawmakers and regulators should make sure that sufficient measures are taken to guarantee that banks and other financial institutions abide by the many laws, rules, and policies. It is imperative for the authorities to ensure that every aspect of financial inclusion be addressed to help increase the total level of economic activity throughout the country. It is anticipated that expansion in the economy shall be inclusive, affecting every strata, region and economically active agent, without any exception.

The study by Gitaharie, Soelistianingsih, and Djutaharta (2018) explores the impact of bank loans on household welfare in Indonesia. The researchers focused on business-owning households, specifically those running informal businesses with fewer than 20 employees. To analyze the differences in business performance and household welfare, the study adopted the two-stage regression methodology. The researchers also constructed a household welfare index,

considering factors such as wealth, education, housing conditions, and asset ownership. The study's findings indicate that business-owning households with access to bank loans tend to have a higher welfare index. This suggests that access to formal credit can have a positive impact on household welfare. The study's methodology involved collecting primary data from business-owning households, providing important perspectives on the link between bank loans and household welfare in Indonesia.

The study conducted by Abbas and Atanda (2018) examined the relationship existing between inclusive finance, and the contributions which Micro, Small and Medium scale Enterprises (SMEs) have on Nigeria's drive towards sustainable growth. The researchers used a quantitative approach, analyzing data from various sources, including the Central Bank of Nigeria and the National Bureau of Statistics. The findings of the investigation revealed a remarkably favourable relationship between financial inclusion and the growth of Nigeria's micro, small, and medium-sized enterprises. The research concludes that financial inclusion is not only crucial to the growth of SMEs but also contributes positively to wealth creation. Their activities contribute significantly to Nigeria's economic growth, employment, and poverty reduction. Lastly, the researchers identified financial constraints as a major obstacle to SMEs' growth and development in Nigeria. The study concludes that financial inclusion is crucial for SMEs' growth and contribution to Nigeria's sustainable growth. The researchers recommend that policymakers and financial institutions implement initiatives to increase financial inclusion, particularly among SMEs, to promote sustainable economic growth in Nigeria.

Three years later, in 2021, Anga et al. came out with a similar outcome when they utilized the Error Correction Model to investigate the impact of financial inclusion on Small and Medium-sized Enterprises (SMEs) in Nigeria between 1990 and 2019. The results confirmed a long-term

relationship between financial inclusion and SMEs, with financial inclusion measured by deposit/savings, access to financial institutions, and credit to the private sector. The findings revealed that financial inclusion has a statistically significant and positive effect on SMEs during the study period. However, access to credit was found to have a negative and significant impact on SMEs. Based on these results, policymakers are recommended to implement strategies that enhance financial inclusion through improved access to financial institutions, deposits/savings, and favorable lending conditions to facilitate easier access to credit, ultimately promoting SME growth in Nigeria.

To wrap up their investigation, Duc and Anh (2019) first created a multivariate index to help them look at financial inclusion globally, especially in developing ASEAN nations like Vietnam and Thailand. The two concluded that financial inclusion should be encouraged as a matter of need after following the discovery of a significant link between financial inclusion and economic growth, with lower levels of financial inclusion in wealthy countries and a stronger relationship for low-income countries.

Seth and Acharya (2018) employed a range of panel data models, including country-fixed effect, random effect, and temporal fixed effect regression, to examine the relationship between financial inclusion and economic development. Specifically, they utilized panel cointegration and panel causality tests to further investigate this relationship.

Moreover, Bouzkurt et al. (2018) examine the factors influencing differences in the degrees of financial inclusion using panel data gathered from 120 countries between 2011 and 2014. In the investigation, OLS and spatial regression methods were used to assess the following variables. The results show that social, banking, and political issues will play a significant contribution to the

future development of financial services. A worldwide convergence in financial inclusion is also noted in the report.

Tambunlertchai (2018) examines the obstacles to saving as well as variables influencing the availability of official savings products. In Myanmar, 5100 questionnaires are being distributed. The variables utilised in the analysis include age square, gender, married status, own money, mthlyinc, primedu, lowsecedu, hisecedu, higher edu, infconsumer, fent, and infent. Using a logit model, the study found that formal savings are low in Myanmar and increase with income, education, and budgeting skills, among other attributes.

Abel et al. (2018) examined the variables influencing financial inclusion in Zimbabwe using cross-sectional data and the logit model. The study's variables included age, education, income, financial literacy, and internet connectivity. Other factors included the need for specific documentation to open an account and the proximity to the closest access point. According to the study's results, access to and use of financial services have a detrimental impact on financial inclusion, more so with the quantity of paperwork needed to open a bank account and the distance to the closest access point. However, access to and use of financial services positively correlated with age, education, financial literacy, income, and internet connectivity. Using cross-sectional data with the following variables age in years, income, education, gender, financial inclusion, financial literacy, and financial innovations.

Akileng et al. (2018) look into how financial innovation and literacy might increase financial inclusion in Ugandan families. Using the the Logit model, the study revealed that financial innovation, as well as financial literacy are superior indicators of household financial inclusion.

Ananwude, Anyanwu, and Andrew (2018) evaluated the impact of Nigeria's microfinance model on women's empowerment through financial inclusion. The study aimed to assess whether the microfinance program had achieved its intended goal of economically empowering women. The researchers employed a mixed-methods approach, combining both quantitative and qualitative data collection and analysis methods. They collected data from 300 women beneficiaries of the microfinance program in Nigeria. The findings revealed that the microfinance program had a positive impact on women's economic empowerment, particularly in terms of increased access to credit, improved business performance, and more informed household decision-making. However, the study also identified some challenges facing women's empowerment through microfinance, including high interest rates, limited access to education and training, and societal cultural barriers. The authors recommended that policymakers and microfinance institutions should implement measures to address these challenges, such as reducing interest rates, providing education and training programs, and promoting cultural sensitization.

Kim et al. (2018) conducted a comprehensive study on the relationship between financial inclusion and economic growth, employing regression analysis and instrumental variable analysis. Utilizing data from diverse sources, including the World Bank, International Monetary Fund, and national statistical agencies, they examined the nexus between financial inclusion and economic growth across various countries. The study's key findings revealed a positive correlation between financial inclusion and economic growth, establishing a causal relationship between the two. Furthermore, the research identified several mechanisms by which financial inclusion influences economic growth. They include increased access to credit, improved savings rates, and enhanced financial stability. The study concludes that financial inclusion has a positive impact on economic

growth, and that policymakers should prioritize initiatives that promote financial inclusion, such as expanding access to banking services and improving financial literacy.

In a similar vein to Kim et al. (2018), Zulkkhibri and Ghazal (2017) explored the relationship between financial inclusion and economic growth, yielding comparable outcomes. Their findings uncovered a positive correlation between financial inclusion and economic growth, and revealed that financial development, as measured by financial inclusion indicators, significantly contributes to economic growth. The study also underscored the importance of country-specific factors, such as institutional quality and macroeconomic instability, in shaping the relationship between financial inclusion and economic growth. Utilizing various financial inclusion indicators, including access to bank accounts, credit, and insurance, the research measured financial inclusion. Ultimately, the study concluded that financial inclusion is a crucial driver of economic growth, emphasizing the need for policymakers to focus on enhancing financial inclusion indicators to foster economic development.

Nwafor and Yomi (2018) used time series data to investigate the factors influencing financial inclusion in Nigeria, viz, financial deepening index, measured by the following metrics: GDP, bank credit to GDP ratio, GDP to total money supply ratio, percentage of rural deposits in commercial banks, percentage of rural deposits in commercial bank loans, and percentage of commercial bank deposits. The two-stage least squares regression method is also referred to as “Generalised Method of Moments (GMM), Two-staged Instrumental Variables (TSIV), and Limited Information Maximum Likelihood (LIML) estimation. The study revealed that financial inclusion had a profound effect on Nigeria's economic growth and that, throughout the evaluation period, financial industry intermediation had a minimal effect on financial inclusion. It was proposed that Nigerian banks provide financial products to reach the sections of the country that

are economically underserved communities because doing so will raise GDP per capita and promote economic growth.

By tracking and testing the presence of long-term dynamics between inclusive finance and the growth of national GDP in Rwanda's commercial banks, Xu and Moise (2018) were able to demonstrate the existence of a long-run interrelationship between access to and use of financial service and growth in the Rwanda national income. The study used time series data and Autoregressive Distributed Lag methodology. With the exception of two, all factors evaluated for were significant, according to the short-run dynamics outcome. The statistical insignificance of the quantity of services outlets of Banks and Automated Teller Machines for each square kilometer was determined.

Okoye et al. (2017) investigated the impact of financial inclusion on Nigeria's economic growth and development between 1986 and 2015, utilizing the Ordinary Least Squares (OLS) approach in their research titled "Financial Inclusion as a Strategy for Enhanced Economic Growth and Development." The study adopted a multifaceted approach to measure financial inclusion, encompassing the loan-to-deposit ratio, loans to rural areas, branch networks, and financial deepening indices. The study's measures of financial deepening were GDP to private sector credit and GDP to the whole monetary aggregate. Using National gross income (GDP and economic growth as proxies throughout time, the researchers used per capita income to measure poverty and create a development index. The analysis established that although credit to the private sector has not substantially boosted Nigeria's economic growth, financial inclusion has helped the country's rural areas to access more credit and, therefore, reduce poverty. The research suggested that monetary authorities should increase their efforts to drive financial inclusion by improving better

and more efficient ways of delivering private sector credits. They argue that this will ensure more efficient and effective resource allocation and usage.

Uddin et al. (2017) evaluated the contribution of various kinds of financial inclusion in Bangladesh using panel data and quantile regression methodology and generalized methods of moments (GMM). Among the criteria included in the study are financial aspects, bank size, cost-to-income ratio, interest rate on deposits (profit rate for Islamic banks), interest rate on loans and advances, inflation rate, dependence ratio, natural log of gross national income (GNI), and inflation rate. The study found that the size, effectiveness, and supply-side interest rate of a bank had a direct bearing on financial inclusion. There is a negative correlation between financial inclusion and the dependence ratio on the demand side but a positive correlation with the literacy rate. Furthermore, the results of quantile regression analysis demonstrated that the bank's size indicates a strong impact on how it collects deposits and distributes advances and loans.

Ajide (2017) analyses the factors influencing financial inclusion by taking into consideration the role of institutions in a panel of eighteen (18) SSA countries using a dynamic Method of Moments Estimation (MME, also known as Generalised Instrumental Variables or Generalised Estimating Equations or System GMM or two-step GMM). The study considered several factors, including inflation, real interest rates, private lending, the assets of the three main banks, and a composite indicator of good governance that included political stability, accountability and voice, and corruption control. Results consistently emphasise institutions' contribution to advancing financial inclusion, together with other relevant controls such as GDP per capita, inflation, bank concentration, z-score, etc.

Goel and Sharma (2017) examined an index that uses time series data to deliver a detailed picture of India's Asset-based sectors. Numerous account numbers, ATM density for each 100,000

inhabitants, the ratio of bank branches to population (for every 100,000 inhabitants), the proportion of scheduled commercial banks for every 100,000 square kilometres, and the number of life insurance policies were among the variables utilised in the analysis. The findings show that between 2012 and 2015, India's financial inclusion was low. India's level of financial inclusion rose in 2013, falling into the medium range. The primary shortcoming of the paper is its incapacity to offer a fitting and comprehensible description and employ a conventional model for analysis.

Wang and Guan (2017) were determined to investigate the extent of financial participation in every country using cross-sectional parameters. The study incorporated individual factors, including communication, education, and wealth, and employed spatial regression approaches such as a spatial lagged model (SLM) and a spatial error model (SEM). Based on a geographical spatial aggregation distribution, the findings indicate that developed countries in Europe and North America exhibit a greater degree of inclusive finance than developing economies in Africa and much of Asia. The results show that while banking health and depth of funds are the primary determinants of financial inclusion, a person's income, education, and usage of communications technology also significantly influence broadening their access to financial services.

Harley et al. (2017) undertook an empirical investigation into the effects of financial inclusion on economic growth and poverty alleviation in a developing economy, employing panel data analysis spanning 2006-2015 within the framework of Logarithmic linear model specification. The existing literature exerted an influence on the methodological approach adopted in their study. The data collected across three countries in Africa on operational cash centres, financial service centres, and state apparatuses expenditure were identified as the most accurate measure of financial inclusion impact on improved livelihood in emerging economies, based on the model's findings.

They predict that a 1% increase in the proportion of ATMs in operation will result in a 0.0082% increase in GDP and a decrease in poverty in emerging markets. They claim that data indicates that the majority of ATMs in developing nations are antiquated, and that for them to make a meaningful difference in rural areas, technology needs to be updated. The model's independent variables had a pretty high coefficient of determination since they collectively explained more than 92% of the fluctuations in the real growth rate of the GDP. The experts recommended that the government concentrate on building infrastructure that will improve banking services to reduce poverty.

A 2017 study by Gretta examined the implication of inclusive finance on the growth of emerging countries' economies, namely those in the Arab world and North African region and the BRICS region. He also examined a number of distribution channels for financial literacy, financial intermediaries, and increased GDP output. To evaluate the interrelationship between financial inclusion and access to growth, financial activities, and financial literacy as well as to evaluate the impact of financial inclusion on economic growth in the MENA region, the study utilised a VAR model. His findings illustrated the importance of financial inclusion in the MENA and BRICS regions.

Oyelami et al. (2017) examine the variables influencing financial inclusion in Africa south of the using Panel Autoregressive Distributed Lag (ARDL). Among the variables utilised in the analysis are borrowers, depositors, lending and deposit interest rates, GDP per capita, ATMs, commercial bank branches, school enrollment, and internet usage. According to Pool Mean Group (PMG), the region's financial inclusion is significantly influenced by both demand side factors (literacy and income level) and supply side factors (interest rate and bank innovation mediated by

ATM usage). To determine and examine the variables that impact access to financial infrastructure in Central and West Africa,

Research conducted by Migap et al. (2017), examined the expansion of Nigeria's economy from 1986 to 2017. The changes brought about by financial inclusion on growth in relation to total factor productivity, capital accumulation, natural resource rent, and labor services was also examined with applying the Autoregressive Distributed Lag (ARDL) methodology. The empirical evidence presented in this research demonstrates a substantial and powerful explanatory factor for labor services and capital accumulation. On the other hand, it had minimal effect on total factor production and rent from natural resources. It was also shown that there is no direct correlation between financial inclusion and the capital market. Nonetheless, it demonstrated a one-way causal link between the growth of Nigeria's economy and its capital market. These results guide the research recommendations, which state that legislation should enable Nigerian banks to offer individual savings accounts with tax advantages and competitive interest rates, as well as debentures with a minimum duration of five years to enhance their capacity for long-term lending. The Central Bank ought to establish a structure that fosters collaboration between financial institutions and the market to leverage the policy aimed at augmenting and expediting the country's macroeconomic expansion. Banks should be encouraged to develop neighborhood cooperative financial institutions in rural areas, emphasising small deposit acceptance and lending to small businesses in the area.

Cihak, Mare, and Melecky (2016) evaluated the interrelationship between access to and use of financial services, financial stability, and explored whether increased access to and use of financial services can help foster a greater and more robust financial system. The authors analyzed data from 150 countries using econometric models to investigate the link between financial

inclusion and financial stability, uncovering evidence that financial inclusion can exert both stabilizing and destabilizing influences. Specifically, they reported that increased access to financial services can diminish financial stability risks by reducing the informal economy and increasing the transparency of financial transactions, thus, improving the resilience of households and firms to financial shocks, and enhancing the overall ability of the banking system to facilitate transactions. On the other hand, the authors noted that rapid expansion of financial services can also increase financial stability risks, particularly if, financial institutions take on excessive credit risk or engage in reckless lending practices. Regulatory frameworks are inadequate or poorly enforced, and financial consumers lack the necessary financial literacy and awareness. The authors recommended that policymakers should strike a balance between promoting financial inclusion and maintaining financial stability, and they can do so by implementing robust regulatory frameworks and supervisory practices, encouraging financial institutions to adopt prudent lending practices and robust risk management, and promoting financial literacy and consumer protection. Overall, the study highlighted the complex relationship that exist between financial inclusion and financial stability, emphasizing the need for policymakers to carefully manage the trade-offs between these two important objectives.

Soumare et al. (2016) used the following variables: account, savings, borrowings, age, frequency, female, education, income quantile, employment status, rural, marital status, and household size. Using the logit model, the study concluded that the primary factors influencing formal financing access in the two regions are individual characteristics such as gender, age, income, place of residence, employment status, marriage status, household size, and degree of trust in financial institutions.

Researching on the topic, “Modelling the effect of financial inclusion on Small and Medium-sized Enterprises in Nigeria”, Anga, Sakanko, & Adamu, (2021), in the study employed the Error Correction Model for the exercise and for the period from 1990 – 2019. A cointegrative relationship was discovered between small and medium-sized enterprises (SMEs) and financial inclusion, as measured by deposit/savings activities, access to financial institutions, and credit availability to the private sector. The study's results further indicated that financial inclusion, comprising deposit/savings facilities and access to banking services, exerts a positive and statistically significant influence on SMEs. Conversely, access to credit was found to have a significant and adverse impact on SMEs. In light of these findings, policymakers are strongly advised to implement strategies that enhance financial inclusion by facilitating access to financial institutions, promoting deposit/savings activities, and providing favourable lending conditions to ease credit accessibility for SMEs in Nigeria.

Rentala et al. (2016) use time series data based on International Monetary Fund (IMF) Financial Access Survey data compiled for the years 2004 to 2014 to investigate the determinants impacting the financial inclusion outreach of nations of the Indian subcontinent, also referred to as South Asian countries. Mobile devices, branch adults, insurance policies, mobile transactions, mobile accounts, and Automated TellerMs were the contributing elements. Findings of the study show that there is a substantial link between the proportion of mobile accounts, geographic ATM penetration, as well as the ration between deposit accounts and depositors in commercial banks and geographic branches and ATM penetration. The survey also shows that Sri Lanka is a nation in the Indian subcontinent with the highest level of financial inclusion when it comes to the quantity of bank accounts, borrowing, savings through ATM/debit card use, and insurance penetration.

Bapat and Bhattacharyay (2016) investigated the nature, traits, and determinants of financial inclusion in Pune, a major Indian city, using cross-sectional data and variables such as family type, saving, age, and family member. In the investigation, the multiple regression model was employed. One of the paper's major shortcomings is that it fails to clarify the main conclusions and the regression's results.

Wardhono, Qori'ah, & Indrawati, (2016) characterise the attributes of inclusive finance in Bondowoso and Jember Regency society and pinpoint the variables influencing it using cross-sectional data. The study's factors include gender, age, education, income, distance, and literacy. The presence of a significant number of banking institutions providing financial service facilities indicated that Bondowoso and Jember's overall level of financial inclusion was satisfactory, according to the study, which used the logit model. However, inadequate financial literacy, a dearth of public information, and concerns about using alternative financial service providers continue to hinder others' ability to receive financing. The primary fit issue with the research is its inability to show odd ratio or marginal effects following the logit model, which is an important part of the analysis.

Moreover, Sharma (2016) also examined the interrelationships between the various aspects of inclusive finance and growth of the Indian market. Sharma investigated the main research question in the context of India using the Granger causality methodology and the vector autoregression (VAR) model. The data used was collected between 2004 and 2013 and included a number of topics related to inclusive financial systems and the expansion of fiscal markets. The findings indicate a strong correlation between economic growth and several components of access to and use of financial services, such as banking penetration, service accessibility, and deposit use. Studies on Granger causality indicate that the number of deposit/loan accounts and the gross

domestic product have a unidirectional causal link, while geographic reach and economic growth have a bidirectional association. The statistical analysis validate social banking trials conducted in India with more reputable financial institutions. Sharma (2016) highlighted the importance of access to financial services in creating a robust and effective financial system. According to him, this is necessary, if growth of the country's GDP must be promoted.

Olaniyi and Adeoye (2016) examined the variables affecting financial inclusion throughout Africa. They employed a 14-year data collection from 2005 to 2014 using the dynamic panel data technique. Gross national income (GNI) per capita, Domestic liquidity as a percentage of GDP, financial and digital literacy, internet availability, affordability, usability and accessibility, and no-interest banking operations, are only a few of the numerous factors influencing the degree of financial inclusion on the African continent, as their research have shown. Conversely, financial inclusion was not significantly impacted by the population, savings interest rates, inflation rate, or the amount of local credit provided by regulated financial institutions.

Marshal, et al. (2016) investigated the long- and short-term correlations between the rise of financial intermediation and growth of Nigeria's national income. The study used time series data for the period starting 1970 to 2015. Utilising the VAR testing approach, Johansen co integration testing technique, and the Engle and Granger causality test, the study was able to demonstrate that financial intermediation development indicators, and expansion of Nigeria's economy exist in the longrun. . This implies that the Nigerian economy will be impacted by these actions in the long run. The VAR results showed that both financial intermediation and development indicators provide positive and negative indications when delayed once or twice, however the relationship was weak and insignificant, especially for credit to the private sector. This coefficient did not have the expected sign. This could be explained by the fact that instead of

being put to good use, loans to the private sector was diverted to meet other personal demands. The examination of causality indicates that real GDP and financial intermediation development indicators have a one-way relationship, as opposed to the other way around. According to the study's findings, private lending has less of an effect on Nigeria's economy than M2 to GDP. As a result, it was suggested that financial development policy be given top priority in order to propel and encourage economic progress in Nigeria.

Ammar and Azhar (2016) investigated the link between financial inclusion and economic growth in Iraq, focusing on the impact of financial inclusion on the country's economic development, given its turbulent history and underdeveloped financial sector. Utilizing a quantitative approach and data from the World Bank and the Central Bank of Iraq, the researchers applied regression analysis to examine the relationship between financial inclusion indicators (access to credit, deposits, and bank branches) and economic growth indicators (GDP growth rate and inflation rate). The results revealed a significant positive correlation between financial inclusion and economic growth in Iraq. Notably, the study found that increased access to credit and deposits led to higher GDP growth rates, whereas fewer bank branches were associated with lower inflation rates. The authors concluded that promoting financial inclusion is crucial for Iraq's economic development, particularly in the post-conflict era, and recommended policy interventions to expand access to financial services, improve financial infrastructure, and enhance financial literacy among the Iraqi population.

Nandru, Anand, & Pentala, in 2016, examined the effects of using banking services and owning a bank account as markers of financial inclusion. Account ownership, income level, age, gender, work status, and educational attainment are examples of model variables. Using a logit

model, the study found that ownership of bank accounts, a measure of financial inclusion, is significantly influenced by both education and income level.

Babajide et al. (2015) studied Nigeria's economic growth with financial inclusion. Their research sought to clarify the factors affecting financial inclusion and how it affects economic expansion. They used an ordinary least square regression model using secondary data from global development indicators to carry out their investigation. Their results demonstrate that capitals per worker and total factor of production, both of which depend on financial inclusion-have an impact on the economy's ultimate level of output. The research proposed the appropriate utilisation of natural and economic resources as a substitute approach to revitalise and broaden Nigeria's oil-dependent monocultural economy.

Onaolapo (2015) researched how financial inclusion affected Nigeria's Economic growth from 1982 to 2012. The study's data, according to the researcher, came from secondary sources such the World Bank, the Federal Office of Statistics, and the statistical bulletins published by Central Bank of Nigeria (CBN, FOS). The primary data sources for the study were a few bank measures, such as Branch Network, Loan to Rural Area, Demand Deposit, Liquidity Ratio, Capital Adequacy, and Gross Domestic Product. Ordinary least squares were utilised for the data analysis. Regression study results indicate that inclusive bank financial activities, such as lending to small enterprises and rural areas, significantly reduce poverty ($R^2 = 0.74$) but have little effect on financial intermediation and national economic growth. This is because there is about a 50% correlation between the variables on either side of the equations.

Olaniyi (2015) used the panel FMOLS for the years 2005 to 2014 in his analysis of the impact of economic and financial inclusion on African economies. He used this knowledge to provide specific evidence of these effects. The financial systems of African countries experiencing

rapid economic expansion tend to be more inclusive. The research revealed that financial inclusion has a major positive impact on economic growth. It is also strongly, and positively impacted by Gross National income (GNI) per capita. In other words, the degree of financial inclusion in Africa is significantly influenced by income. He showed in this study that financial development and economic development go hand in hand, even though the former has a much greater influence. Furthermore, financial inclusion is negatively correlated with inflation, which is also negligible in all circumstances. Although there is a slight positive correlation between deposit interest rates and financial inclusion, inclusive financial systems are not promoted by the low deposit interest rates in African nations. It is a good population, although it is small. Given that internet connection significantly and favorably affects financial inclusion, it is critical for a flourishing, digital African economy. Understanding adult literacy is essential to ascertaining the level of broad-based finance in Africa, and it is statistically significant. An increased degree of financial inclusivity is also linked to the existence and operation of Islamic banks.

First, Abiola, Folasade, and Alexander (2015) investigated the features of inclusive finance in Nigeria before examining their effect on the expansion of economic activities throughout the country. Utilising pre-existing data obtained from Global Development Indicators, this study employed ordinary least square (OLS) regression to analyse the relationships. They discovered that access to and use of financial Services is a significant factor of production and capital per worker, both of which significantly affect the level of national output of economies. Furthermore, the transition to 100% financial inclusion indicates a potential gain of 374% that might be achieved assuming socioeconomic and political circumstances are unchanged. Their research also showed that adequate financial and security safeguards are required for financial systems to mobilise savings to the fullest extent possible.

Nwanne (2015) conducted a critical analysis of the possibility of sustaining the access to and use of financial services in Nigeria's village communities using a combination of content analysis and descriptive research methods. The research revealed the existence of long-term broad-based financial services among rural households continues to be the most effective lubricant for driving the growth of national income in Nigeria. This leads to the conclusion that Nigeria's economy cannot grow quickly if financial inclusion is not implemented enough for the country's rural populace. The research recommended fostering partnership amongst primary stakeholders such as Commercial, and Microfinance Banks, and providers of digital internet communication services. This is expected to enhance financial services intermediation. Reiterating the importance of banking to rural populations is one tactic that could assist in the attainment of the Nation's financial inclusion policy milestones and targets set by the apex Bank since 2012. The discovery that some rural settings still opt to keep their money outside of the banking system due to mistrust and anxiety about how banks operate served to reinforce this conclusion. As a result, they promoted the implementation of appropriate awareness-raising and education initiatives to help clients, especially the impoverished, change their minds about the significance of attaining Nigeria's financial inclusion goals.

Employing cross-sectional data and variables that are determining financial inclusion in Mexico, Pea et al (2014), investigated variables from the demand side, namely, saving deposits, Current and Fixed Deposits, wage Accounts, and Investment Funds. Others include, Bank credit card, payroll loans, personal consumer loans, vehicle loans, and mortgage loans. Using general linear regression analysis, the research found a number of financial inclusion indicators for both the general population and those working in unorganised industries.

Oruo (2013) did research on the possible association existing between expanding economies and inclusive finance within the enclave of the West African Monetary Zone (WAMZ). In order to examine the bi-directional causality at various time scales, he integrated the Maximal Overlap Discrete Wavelet Transform (MODWT) technique with the heterogeneous panel causality test. The total rate of demand for financial services across all demographic groups and the total rate of demographic penetration of banking infrastructure were two metrics of financial inclusion employed in the analysis. Based on the results of this investigation, it was concluded that there was no relationship between the Financial Inclusion indicators at scale 1 (2 - 4 years) and economic development. However, at scale 2 (4 - 8 years). Among others, a, bidirectional causal relationship between financial inclusion and economic expansion, was discerned. The research suggested governments to encourage the enactment of policies that facilitate financial inclusion, especially those that focus on the supply side, and to increase the effectiveness of the levers that drive macroeconomic development, which also seems to be an important element of financial inclusion.

Using panel data, Kumar (2013) examined India's financial inclusion landscape and associated variables. The study used population density, income level, the proportion of factories to represent industrialisation, and the staff base as a stand-in for demographic status were among the study's variables. The temporal trend of the deposit and credit penetration indicators were additional considerations. The study not only demonstrates the importance of a region's social infrastructure, but it also demonstrated that the Branch network has a definite beneficial impact on financial inclusion.

Sarma (2012) provided the data used in this analysis, which covered the years 2004 through 2010. The research revealed a positive, long-term correlation between financial inclusion and economic growth globally. The identified a two-way causal link between financial inclusion and

economic development, suggesting that they reinforce each other. Thus, the study supported the theory that one of the main forces behind economic growth is financial inclusion. It also suggests that longer-term economic growth will be stronger for policies that prioritise financial sector reforms and financial inclusion.

Laha and Kuri (2011) conducted an empirical analysis of inter-state disparities in access to finance in a few chosen districts of west Bengal, India, using cross-sectional data and a probit model. Economic status, years of education, household caste and religion, number of family members, proportion of non-farm employment, dependency ratio, and land operation were among the factors included in the analysis. Research indicates that several critical factors are important in fostering an environment that facilitates the removal of barriers to the process of financial inclusion. These factors include raising household level assets, promoting literacy among rural households, diversifying the non-farm sector in rural areas, and raising awareness of basic banking services.

Agricultural Credit; Financial Inclusion and Economic Growth Studies

Fadun and Silwimba (2023) investigated the connection between Insurance (a form of agricultural finance) and growth of economies with special focus on Nigeria. Using data from Nigeria, the study found Fowowe's 2020 study leveraged the Living Standards Measurement Study-Integrated Surveys to investigate the effect of agricultural credit on the National output of cereals. The research utilized a novel dataset covering agricultural and household activities, including financial behaviors, and employed panel data estimation to analyze three-time-period observations. The outcome of the study showed that inclusive finance has consistently impacted

positively and significantly, on agricultural productivity in Nigeria, regardless of the measurement approach.

Agbodji, and Johnson in 2021 investigated the effect of agricultural loans on productivity, and agricultural output, in the Congo, grounded in the neoclassical theory of Gurley and Shaw (1967) and Mckinnon's (1973) ESR model. The study's findings reveal a significant positive effect of agricultural credit on productivity, with a 92.2% average increase. Additionally, the results show that literacy rate, group membership, and age influence access to agricultural credit. These findings support the hypothesis that access to agricultural credit boosts productivity, highlighting the importance of credit access in improving agricultural outcomes.

On their part, Fouejieu, Sahay, Cihak, and Chen (2020), conducted this study in a bid to expause how financial inclusivity relates with unequal wealth distribution. The research used cross-country analytics to examine how access to financial services affects wealth distribution. Utilising a novel dataset, the study was able to provide empirical evidence on Financial Institution's impact on inequality, while highlighting the role played by macroeconomic conditions. Additionally, the research explored financial gender gaps, their effect on income inequality, and proposed measures for curbing extreme inequality, shedding light on possible complex linkages existing between financial inclusion and socioeconomic disparities.

Igoni, Egbo, and Onwumere (2020) analysed the cause-and-effect nexus between financial sector growth and the agricultural credit guarantee plan's finances. The analysis utilized credit to the private sector (CPS) and broad money supply as indicators of financial sector growth. The statistical bulletin of the Central Bank of Nigeria, provided the prorated data, whilst BOA database provided the ACGSF. For the months of January 2017 through December 2018, monthly data were examined using the Ordinary Least Squares approach. The research found a negative but

statistically insignificant causal link between ACGSF and Broad Money Supply (BMS), despite a positive and significant causal association between ACGSF and (CPS). This may be attributed to the high inflation rate that was common at the time. According to the report, BMS is a significant study variable that the monetary authorities should take seriously. The CBN should tighten the country's cash management policy and conduct a downward review of the inflation rate, according to the study's final suggestion.

A 2020 study by Eze, Onyebuchi, Ohalet, & Ogbonna, examined the consequence of agricultural output on the growth of Nigeria's national income from 1981 to 2017. The research utilized annual data extracted from the World Bank Development Indicators (WDI) Database and employed the Autoregressive Distributed Lag (ARDL) framework. The results showed that, over the long term, most variables - except for external trade (LnEXT) - had a positive association with economic expansion. In contrast, over the short term, all variables showed a negative association with economic prosperity. These findings led the study recommend that the Nigerian government should, diversify the agricultural sector to boost economic growth; increase agricultural spending to support farmers and the sector, as well as provide affordable loans to farmers and agricultural businesses to stimulate growth. By implementing these strategies, governments at any level can promote a more vibrant and productive agricultural sector, ultimately contributing to Nigeria's economic growth and development.

Wonder et al. (2019) conducted a co-integration study of agricultural growth and financial inclusion in Ghana. According to the data utilized, the study discovered a significant negative linkage associating local loans to the business sector and agricultural expansion. The study also demonstrated that the loan interest rates a stand-in for the provision of financial services to farmers significantly influenced the growth of agriculture. To sustain economic activity, domestic credit

must be made available to the private sector immediately, since rural farmers cannot achieve inclusivity through the availability and usage of financial infrastructure on their own. This implies that the more effectively the private sector participates in an economy, the more of a role it will play. To support the agriculture industry, monetary authorities should ensure that lending interest rates at financial and non-financial institutions remain favorable. They suggested altering the rates to make it simpler for farmers to get funding for expansion. For this purpose, the researcher evaluated the long-run relationship between agricultural expansion and inclusive finance in Ghana using time series data from 1980 to 2014. This study utilized the Fully Modified Ordinary Least Square (FMOLS) method, and the Johansen Co-integration methodology were used.

Okunola, Osuma, & Omankhanlen, (2019) investigated the effect of guaranteed agricultural financing on the nation's gross domestic product using time series data extracted from the Central Bank of Nigeria's periodic statistical bulletin on a variety of topics, including oil palm, cocoa, fisheries, livestock, roots, and others. The Autoregressive Distributed Lag (ARDL) methodology was employed to conduct its analysis over a 37-year period, from 1981 to 2017, Findings of the study showed that the data were resistant to both serial correlation and heteroskedasticity, thus the order of integration was ascertained using the Phillips Perron stationarity test. The study used the Newey-West covariance matrix estimator to produce the lag criterion based on the LR, FPE, AIC, SC, and HQ. The Wald test shows that no guaranteed agricultural finance has exerted a statistically significant influence on real gross domestic product, supporting the findings from both the short-run and long-run models. As a result, the research recommends increasing funding while carefully weighing which of the proposed agricultural expenditures will most likely spur growth. Adesanya and Ajala (2018) used time series data from online publications on Nigerian agricultural policy; other sources including periodic publications

of the National Bureau of Statistics, and the statistics bulletin of the Central Bank of Nigeria. They investigated on the interrelationship between agricultural lending and expansion of the National economy from 1985 to 2016. Using the three-stage least square technique to examine the variables, the scholars were able to demonstrate that agricultural loans are a beneficial tool for countercyclical agriculture output, non-oil export, and GDP stabilisation in the Nigerian economy. This demonstrates that such policies worsen over time, even in the event that the GDP value decreased at the conclusion of the period. The study concluded that interest rates, currency exchange rates, and agricultural loans had an impact on Nigeria's total production. Extending agricultural credits is recommended by the research since agricultural output directly affects economic growth.

Tabash (2018) examined the role non-interest banking investments played in the economic growth of the then-developing United Arab Emirates (UAE). Using yearly time series data, the scholar employed the Autoregressive Distributed Lag for co-integration and the Vector Error Correction Model, to investigate the association between the variables under consideration. The findings of the research demonstrated a favorable and statistically significant relationship between economic growth and investments made by Islamic banks, both over the short and long durations. He established the Granger Causality between financial development and economic expansion in Nepal. Thirty-three (33) causality tests revealed a direct correlation between Islamic banks' investments and economic growth.

Focusing on Nigeria's microfinance institutions, Otiwu et al. (2018) assessed the connection between access to and use of bank infrastructure, and economic advancement for the period spanning 1992 to 2013. Using the Ordinary Least Square approach and Johansen Co-integration tests, the study concluded that microfinance operations, one of the financial inclusion

plan's instruments, significantly boosted economic growth. Although microfinance banks' total advances and loans greatly contribute to economic growth, the effect of their total deposits is the opposite. The study's variables, which include GDP, total loans and advances, total deposits, investments, and the number of microfinance banks, were also found to have a long-term link. The study concludes that in order for the economy to expand and flourish, the nation's currently financially excluded class of citizens must be able to have easy reach, and use of banking services because they have enormous untapped potential that will greatly benefit the nation. Given the benefits of financial inclusion, this study advises microfinance banks to concentrate their efforts on low-cost deposits that align with their business practices rather than competing with deposit-taking institutions to mobilise fixed deposits, which are more expensive. Financial education was also suggested as a way to educate the public about the benefits of this new development in the financial system.

Ugbor et al. (2018) evaluated financial inclusion in the agricultural sector by looking at survey data from 600 recovered questionnaires that were sent to farmers in Nigeria's rural and urban locations. The study developed the timeliness gap index and the adequacy gap index based on the pecking order theory in order to quantify the penetration gap index hypothesis of financial inclusion. Since small-scale farmers relied on rain-fed agriculture, the adequacy and timeliness gap indices showed that different formal lending firms were unable to meet their credit needs. Small-scale farmers as a result received funding, which they received gradually and poorly. The penetration gap statistic indicates that the agriculture sector in Nigeria, currently experiences abysmally low rate of social and economic inclusivity. It was suggested, among other things, that the government should increase its efforts to be able to meet farmers' loan demands in order to ensure the spread of financial inclusion.

The study "Back to Land" was conducted by Olaniyi (2017), to examine the effect of inclusive finance on Agriculture in Nigeria. The research explored current relationship between financial inclusion and agricultural growth in Nigeria, using annual data for the period 1981 to 2014. The study deployed the Autoregressive Distributed Lag bounds testing approach to analyze the presence or not of long-run and short-run dynamics in the relationship. The study found that access to and usage of financial services has a significant positive impact on agriculture in both the short and long run. However, access to finance was found to have an insignificant effect on agricultural growth. This suggests that simply providing access to finance is not enough; rather, the focus should be on increasing the usage of financial services, including digital, and agent banking solutions among rural farmers. The study's findings have important implications for policymakers and financial institutions seeking to promote agricultural growth and financial inclusion in Nigeria. By targeting interventions aimed at increasing the usage of financial, and communication services, such as mobile and agent banking, e-wallet. With the right infrastructure on ground, stakeholders can help unlock the potential of Nigeria's agricultural sector.

Adejumo and Bolarinwa (2017) conducted an in-depth analysis of the Agricultural Credit Guarantee Fund Scheme (ACGF) in Nigeria, spanning 35 years from 1981 to 2016. The study aimed to evaluate the performance of the ACGF in promoting agricultural development and providing access to credit for farmers. The researchers employed a descriptive research design, utilizing secondary data obtained from the Central Bank of Nigeria and other relevant sources. Findings of the study revealed that the ACGF had a significant impact on agricultural development in Nigeria, with a substantial increase in the number of farmers benefiting from the scheme. However, the study also identified some challenges facing the ACGF, including inadequate funding, high default rates, and bureaucratic inefficiencies. The authors recommended that the

government increase funding for the scheme, implement measures to reduce default rates, and streamline the administrative process to improve the overall effectiveness of the ACGF. Overall, the study provided valuable insights into the performance of the ACGF in Nigeria and offered practical recommendations for improving the scheme's impact on agricultural growth and development of economies.

Dimgba, Eginiwin, Ogbonna, & Atsanan, (2017) looked into the relationship between bank loans and economic prosperity in a slow-growing economy. The study's objective was to evaluate the degree of correlation between bank loans and the growth of specific small-sized businesses in the country between 1992 and 2015. The study made use of the following econometric tools - Granger Causality, Johansen Co-integration, Philip-Peron and Ordinary Least Square regression, and the Augmented Dickey Fuller Unit Root Test to analyse the data. The outcome of the study showed a strong correlation between bank loans to small businesses and both short- and long-term economic development. In order to stimulate the economy, the research recommends increasing bank loans to small firms, highlighting the fact that small enterprises are essential to the economies of developed countries.

Ayeomoni and Saheed (2016) used time series data and the ARDL technique to evaluate the association between credit facilities extended for the purpose of financing agriculture and the rate of expansion in Nigeria's economy, describing the dynamics of both short-term and long-term dynamics. Their findings showed that, in contrast to the inflation rate variable, which had an inverse association with economic development, the exchange rate and domestic loans to personal holdings had a direct influence on economic expansion. Policymakers ought to aim to increase the quantity of agricultural loans given to drive Nigeria's economy and increase agricultural productivity.

Anetor et al. (2016) looked into how credit availability and the operation of numerous commercial bank loan programmes affected the agricultural sector's output. The study made use of time series data and the vector auto-regressive (VAR) approach with data from the statistical bulletin from the Central Bank of Nigeria, analysis was conducted over the sample period of 1981 – 2013. The result of the research showed that while commercial loans to the agricultural sector exerted a substantial influence on agricultural production, ACGSF performed poorly in explaining the performance of the agricultural sector. The research recommends the provision of soft loan facilities at interest rates below market rates, with other incentives which government must put in place to incentivise commercial banks to direct more loanable funds towards agriculture and the rural sectors.

Egwu (2016) used the ordinary least squares method to examine the effect of agricultural finance on agricultural output, expansion of the country's economy, and reduction in the rate of poverty perverting the country. The results of the study demonstrated the critical role that loans from commercial banks and agricultural credit guarantee programmes had in increasing the share of Nigeria's GDP that came from the agricultural sector, hence reducing poverty and accelerating the country's economic progress. This study's components all demonstrated long-term associations. In order to make CBN agriculture policies more accessible to farmers in rural areas, the research recommends reviewing them along with other government rules including the land use decree and commercial agricultural loans.

Awotide et al. (2015) employed the Endogenous Switching Regression Model (ESRM) to examine the relationship between credit availability and agricultural productivity using data from smallholder cassava farmers in Nigeria. The ESRM's research indicates that the size of the farm and the livestock unit have a favorable and statistically significant impact on a farmer's ability to

get loans. In spite of their negative correlation, they discovered that livestock and farm size are statistically significant in explaining the variation in cassava production among the farmers who have access to funding in the second stage of the model. On the other hand, farm size, household size, and information availability were critical and damaging for farmers without access to funding.

Onaolapo and Odetayo (2012) advocate the distribution of additional credits to rural inhabitants in a way that is comparable to that proposed by Otiwu et al. (2018). The study, which was based on primary data on Nigeria's Microfinance Banks (MFBs), discovered that in order for MFBs to function well and further Nigeria's financial inclusion strategy, they need to leverage financial inclusion strategies and technologies, such as mobile and agent banking, to help them reach out to the rural poor. They recommended that in order for the MFBs to accumulate investable wealth, they mobilise sizeable amounts of rural deposits.

Summary of Literature

The detail that follows provides a brief analysis about the interrelationship between, agricultural credit, financial inclusion (access to, and use of financial apparatuses), economic growth and causality studies.

Table 4

Financial Inclusion and Economic Growth

S/N	Scholars and Year of study	Purpose	Study period	Parameters adopted	Approach/ Technique	Outcomes
1.1	Adedokun & Aga (2020)	Financial inclusion (FI) and economic growth (EG)	Sub-Saharan African (SSA) Data taken between 2004 and 2017	ATMs, Branches, Accounts, Borrowings, and deposits by customers	Generalised methods of moments and Dumitrescu-Hurlins causality Tests.	Economic growth in SSA nations is significantly boosted by financial inclusion.
1.2	Duc & Anh (2019) 2004-2007, 2007-2009, 2009-2012, 2012-2015.	Financial inclusion and economic growth	Emerging markets (ASEAN region), including Thailand and Vietnam).	Bank branches, number of ATMs, bank credit for the private sector to GDP	Panel econometric technique	Positive correlation between FI and EG, which is higher for low-income nations but lower for developing economies.
1.3	Seth & Acharya (2018).	Financial inclusion and economic growth	The world; for the period, 2004-2010	Single indicator approach using Banks only	Panel data models - country-fixed effect, random effect and time-fixed effect regressions, panel co-integration, & panel causality tests.	The finding shows that in 31 nations of the world, there is a long-term, favourable association between financial inclusion and economic development. Also, Financial inclusion and economic growth are causally related in both

directions; and FI fuels economic growth.

1.4	Sharma (2016)	Financial inclusion and economic growth	India; period 2004-2013	Banking penetration, availability of banking services, and use of banking services, i.e. deposits.	The vector autoregression (VAR) models and Granger causality methodologies	Economic development and several aspects of financial inclusion, notably banking penetration, access to banking services, like terms deposits; are positively correlated. Additionally, there is a one-way correlation between the quantity of deposit or loan accounts, GDP and a two-way causal link between geographic reach and growth of economies.
1.5.	Migap et al. (2017)	Effect of financial inclusion on macroeconomic growth	Nigeria; From 1986 to 2017	Total factor productivity, capital accumulation, natural resource rent and labour services.	Autoregressive distributed lag (ARDL) approach	A strong explanatory variable for capital formation and labor services, financial inclusion was extremely significant.
1.6.	Moise & Xu (2018)	Monitor and test the existence of long-term dynamics between inclusive finance and economic expansion	Ruwanda; 2004 – 2016	Gross Domestic Product (GDP), Automated ATMs; no of Branches; Deposit accounts, Outstanding loans and accounts.	Autoregressive distributed lag (ARDL) approach and time series data	All but two factors evaluated, were found to be positively significant. The number of bank branches and Automated Teller Machines (ATMs) per square kilometer were analysed and found to be statistically insignificant.

1.7	Olaniyi & Adeoye (2016)	Examine the causal factors of financial inclusion	Africa for the period 2005 - 2014,	Per capita income, broad money (% of GDP), literacy, internet access and Islamic banking activities; Local credit granted by formal financial institutions (% of GDP), savings interest rates, inflationary trends and population	Dynamic panel data approach	Financial inclusion in Africa was influenced by a number of factors, including per capita income, wide money (as a percentage of GDP), literacy, internet availability, and Islamic banking operations.
1.8	Wakdok (2018)	Financial inclusion on economic growth	Nigeria; 1990 – 2014	Broad money, credit to private sector, loan deposit of the rural area and liquidity ratio of commercial banks.	The vector auto-regression (VAR) models and Granger causality methodologies	Economic Growth in Nigeria is positively and significantly impacted by Financial Inclusion.
1.9	Erlando et al. (2020)	Investigated the contribution of financial inclusion to economic growth, poverty alleviation and income inequality	Eastern Indonesia;	financial inclusions, economic growth, poverty reduction and income distribution	Toda-Yamatoto VAR bivariate causality model and dynamic Panel Vector Auto-regression (PVAR) methodologies	FI, economic growth, poverty alleviation, and income distribution have been strongly linked. Additionally, it was shown that while financial inclusion benefited from economic expansion, poverty saw a negative influence.
1.10	Olaniyi (2017)	Financial inclusion and growth of agriculture	Nigeria; 1981-2014	Financial Inclusion, Access to Finance, Usage	ARDL bounds testing approach,	The study established long run and short-run relationship between the variables,

				of Financial Products.		namely financial inclusion and agric. in Nigeria. Conversely, access to finance has insignificant impacts on agricultural growth.
1.11	Abiola et al. (2015)	Financial inclusion and growth economic growth	Nigeria; 1980-2013	Commercial bank deposit, Capital per work, Total factor productivity.	Ordinary least square methodology was used.	It has been established that financial inclusion plays a big role in capital per worker and production, both of which have a considerable impact on the level of national output of economies.
1.12	Okaro (2016)	Financial inclusion and Nigeria's economy	Nigeria, 1990-2015	Model one RGDP, Deposit of rural branches DMBs Loans	Quantitative research technique. The design is ex-post facto type	Economic growth (RGDP) is positively and significantly impacted by the independent variable.
1.13	Nwanne (2015)	Link between access to financial services, and economic expansion in Nigeria's rural communities	Nigeria	Economic growth, Financial inclusion	Cross section survey and description design, correlation test	The main approach for economic progress in Nigeria continues to be financial inclusion for rural people.
1.14	Sethi & Sethy (2019)	The relationship between financial inclusion (FI) and economic growth.	SAARC countries 2004-2010	Used both supply-side and demand-side variables.	Used multidimensional time-varying index methodology; ARDL approach to co-integration and nonlinear	Shown a long-term link between FI and economic expansion. Economic growth is positively impacted by the improvement in both demand- and

				ARDL Test, and the Toda–Yamamoto Granger causality	supply-side financial services; FI has no asymmetric impact on economic growth.
1.15	Okuma et al. (2019)	Examined the causal relationship between financial inclusion and agricultural sector output	Nigeria	Prime lending rate, deposit rate, agricultural credits guaranteed, demand deposits from rural areas; and the deposits of bank loans to small-scale enterprises	Employed the Unit Root Test, Engle-Granger Co-Integration Test, Error correction Model (ECM) Test and Granger Causality Tests, There was no direct connection between the explanatory factors and the dependent variables, and financial inclusion only partially explained changes in the agriculture sector production in Nigeria (41%).
1.16	Marshal et al. (2016)	Analysed the long run and short run dynamics between financial deepening and economic expansion.	Nigeria; 1970-2015	M2 to GDP and credit to private to GDP.	Used the VAR testing approach, Johansen co integration testing technique and Engle and granger causality test. Shows that financial intermediation, development indices, and economic growth are in a long-term equilibrium.
1.17	Oruo (2013)	Examined the causal relationship between Financial Inclusion and economic growth	West African Economic and Monetary Union (WAEMU); 2006 – 2015	Financial Inclusion supply; and Financial Inclusion demand variables	Heterogeneity panel causality test; with the Maximal Overlap Discrete Wavelet Transform (MODWT) approach There was no causal relationship between the FI and EG indicators at scale 1 (2-4 years). However, a bi-directional causation

between FI and EG was found at scale 2 (4–8 years).

1.18	Camillus et al. (2019)	Evaluated the relationship between financial inclusion and Nigeria's agricultural output (AOG)	Nigeria	Prime lending rate, deposit rate, agricultural credits guaranteed, demand for deposits and deposits of bank loans as a percentage of total loan.	Unit Root Test, Granger Causality Test, Error Correction Model (ECM) approach and Granger Causality	The Granger Causality Test provided further evidence that there was no causal link between the explanatory factors and the dependent variable.

2 Agricultural Credit and Economic Growth Studies.

2.1	Wonder et al. (2019)	Examined the co-integration analysis of agricultural growth and financial inclusion	Ghana; 1980-2014	Domestic credit to the private sector and Lending interest rate	Johansen Co-integration approach coupled with Fully Modified Ordinary Least Square method (FMOLS)	While lending interest rates had a considerably good influence on agricultural growth, local credit granted to personal enterprises revealed inverse link and major impact.
2.2	Adesanya & Ajala (2018)	To examine the effect of agricultural credit on economic growth	Nigeria; 1985-2016	Agricultural credit and output non-oil export & GDP	The three stage least square analysis was employed.	Exchange rates, interest rates, and agricultural credit all have a significant impact on Nigeria's total production.
2.3	Ugbor et al. (2018)	Investigated financial inclusion in the	Nigeria;	Timeliness; penetration gap indices	Utilised survey data to develop the adequacy gap index and	The multiple official lending organisations were unable to

		agricultural sector			timeliness gap index to measure the penetration gap index of financial inclusion	satisfy the credit demands of these small-scale farmers; financing was both inadequate and late, according to the adequacy and timeliness gap indexes.
2.4	Awotide et al. (2015)	The impact of access to credit on Agricultural Productivity, with evidence from Smallholder Cassava farmers	Nigeria	Credit, farm size, household and access to information	Endogenous Switching Regression Model (ESRM)	Farm size and livestock unit are statistically significant factors that affect a farmer's ability to acquire finance. In the second stage, the statistical significance of livestock and farm size is negative, but it still helps to explain the differences in cassava output among the farmers who have access to financing.
2.5	Okunola et al. (2019)	Examine the impact of guaranteed agricultural finance to oil palm, cocoa, fishery, cattle, roots, and tuners on gross	Nigeria; 1981-2017	Agricultural Finance and Real GDP	Autoregressive Distributed Lag (ARDL) model for its analysis. Phillip Perron stationarity test was used to determine the	Wald test results reveal that none of the guaranteed agricultural financing is statistically significant to real GDP, which is supported by both

		domestic product			order of integration	short-run and long-run models.
2.6	Ayeomoni & Aladejana (2016)	Examined the relationship between agricultural credit and economic growth, setting out both the short-run and long-run dynamics.	Nigeria	Inflation rate, exchange rate, and domestic credit to private investment	ARDL method	The exchange rates and domestic loans to private investment had a direct influence on economic development, while inflation rate was negatively correlated with it.
2.7	Dimgba et al. (2017)	Studied the extent to which Bank Credit relates to economic growth in a recessed economy	Nigeria; 1992 to 2015	The variables employed the GDP, Credit granted by Commercial Banks to SSEs, and Credit extended to the Private Sector	The study employed the Philip-Peron and Augmented Dickey Fuller Unit Root Test, Johansen Co-integration, OLS regression and Granger Causality.	In both the short and long terms, bank loans to small businesses has a substantial impact on economic growth.
2.8	Anigbogu et al. (2015)	Growth of financial intermediaries and Small relative to the performance of Medium-sized enterprises (SMEs) performance	Nigeria	Bank interest rate, Loans and advances to SMEs, Bank lending to SMEs, Exchange rate and monetary policy	Econometric model of ordinary least square OLS	The impact of loans and advances, bank lending rates, and monetary policy on SMEs is favorable and considerable. Interest rates do not matter much.

3 Agricultural Credit Institutions' Operations, Financial Inclusion and Economic Growth Studies

3.1	Tabash (2018)	Examined the role of Islamic banking investments in enhancing the	UAE	GDP Islamic Investments	Autoregressive distributed lag (ARDL) framework employed for	The findings posit that economic growth and investments made by Islamic banks

			economic growth of United Arab Emirates (UAE) economy			co-integration, along with error correction models.	have a favorable and statistically significant association both in the short- and long-term.
3.2	Igoni et al. (2020)	Investigated the causal relationship between financial deepening and agricultural credit guarantee scheme funds (ACGSF).	Nigeria	Broad money supply (BMS,) and credit to the private sector (CPS)	used the Ordinary Least Squares (OLS)	ACGSF demonstrated a positive and substantial causal link with (CPS) but a negative and negligible causal relationship with BMS.	
3.3	Bassey et al. (2017)	Evaluated the impact of access to and use of financial services on the performance of Micro, Small and Medium Enterprises (MSMEs)	Nigeria,	.Operational efficiency, distances of Branches, and infrastructural facilities	Pearson Chi-square techniques	revealed a straight connection between financial inclusion, MSMEs' operations, and their expansion.	
3.4	Anetore et al. (2016)	Examined the impact of credit supply, and the operations of various commercial banks under the CBN-ACGSF	Nigeria; 1981 to 2013	GDP and guarantee of Credit supply by Commercial Banks	Used the Vector autoregressive (VAR) approach.	Agricultural productivity was significantly impacted by commercial bank loans, although the. In the agriculture sector performance, ACGSF did poorly.	

3.5	Egwu, (2016)	Investigated the impact of lending to agriculture on agricultural output, economic prosperity and poverty alleviation.	Nigeria	Agricultural credit, Agricultural output, GDP	Ordinary least squares method ((OLS).	Commercial banks loans made under the agricultural credit guarantee Fund were found to be crucial in increasing the proportion of agricultural sector contribution to GDP.
3.6	Otiwu et al. (2018)	Examined the relationship between financial inclusion and economic growth	Nigeria's Micro-finance Banks (MFBs); 1992 to 2013	Total loans and advances; Total deposits	Used the Ordinary Least Square method and employing the Johansen Co-integration tests.	The actions of microfinance banks (MFBs), one of the tools used in the financial inclusion approach, have aided economic expansion; A long-term link between the variables GDP, total loans and advances, total deposits, and investments was also found.
3.7	Onaolapo & Odetayo (2012)	Examined the causes of financial exclusion in Nigeria to help identify financial inclusion strategies that MFBs could employ to survive stiff	Nigeria's MFBs,	Access and demand variables, as well as accounts opened and Loans	Survey approach	The factors of financial exclusion in Nigeria were highlighted by the study.

		competition in the global environment							
3.8	Onyinye et al. (2017)	Whether or not capital formation has any significant impact on economic growth and determine the direction of causal relationship between capital formation and economic growth	Nigeria's nonlife insurance 1988-2014	Real domestic product (RGDP)	gross	VEC causality test.	granger	Real domestic product (RGDP) and GCF have a favorable long- term association that is both stable and persistent.	gross

Source: The Researcher, 2023

Summary of Reviewed Literature

Causality Hypothesis

The constant free flow of funds from saving surplus units to saving deficit units that require them for investment objectives is what enables the multiplier impact of money (Nwafor & Yomi, 2018; Kama & Adigun, 2013). This transaction is carried out by financial institutions in every economy. In every developing nation, efficient credit facilities are the driving force behind investment and productivity (Ijere, 1996). Therefore, in a developing nation like Nigeria, extending appropriate credit windows to significant economic sectors on both a small and large scale increases productivity. Therefore, any policy promoting social, and economicinclusivity and access to financial services is expected to boost the economy (World Bank, 2012). Every economy's financial sector acts as a growth stimulant, according to economic theory (Omar &

Inaba, 2020). Numerous empirical studies have shown that financial services represent a significant development engine (Demirguc-Kunt et al., 2018, 2015; Jabir et al. 2017, Evans & Adeoye, 2016, Sunde, 2012; McKinnon, 1973). This does not, however, rule out the possibility that growth and financial inclusion are causally related, as evidenced by research by Omoto (2017), Odhiambo (2008), Robinson (1952), and other researchers. A few other studies by Patrick (1966); and Greenwood & Jovanovic (1990) have also demonstrated causal relationships or lack thereof between financial deepening and expansion that is bidirectional.

Dependent Variable

Based on empirical research, the majority of scholars examining the connection between access to and use of finance and growth often focus on financial inclusion and macroeconomic metrics such as GDP (Otiwu et al., 2018; Olaniyi & Evans, 2017; Marshal et al., 2016; Egwu, 2016; Shaw, 1973; McKinnon, 1973). This argument supports the hypothesis which states that the growth rate of a nation's unique and niche industries, is correlated with the nation's overall economic growth. As a result, the numerous small, medium, and large businesses, particularly those within the real sectors of economy, namely, those SMEs that are associated with manufacturing, mining, quarrying, tourism, oil and gas, agriculture, and communication), are expected to drive a country's economic expansion. With a few noteworthy exceptions, most research on agricultural credit, financial inclusion, and economic growth revealed that explanatory factors generally positively and significantly affect the economy. It is crucial to keep in mind that problems that could be directly connected to specific firms may also result in sharper visuals. Before the oil boom of the 1970s, Udomah (2004) claimed that agriculture was the backbone of the Nigerian economy. At the time, the sale of agricultural products generated most of the nation's foreign exchange gains and was the primary employer. The Nigerian economy's structure was

significantly changed by crude oil production and export growth, with oil assuming a leading role (Iwayemi, 2006). Now that the oil industry is in difficulty, we need to revitalise our agricultural sector. Bank of Agriculture (BOA), Nigeria's state owned Agricultural Bank has been mentined because of the mandate it was given to finance agribusinesses throughout the agriculture value chains. Thus, the research sourced data from the Bank, using it as a case study to examine the causal relationships between agricultural loan delivery, financial inclusion, and the growth of Nigeria's economy.

Explanatory Variables

Analyses of the correlation between financing and growth indicate that no research examine more than one government development initiative. This implies a strong association linking inclusive finance with economic progress (Adedokun & Aga, 2020; Igoni et al., 2020; Duc & Anh, 2019; Seth & Acharya, 2018; Kim et al., 2018; Sharma, 2016; Tabash, 2018; Abiola et al., 2015). Moreover, Okunola et al. (2019); Adesanya and Ajala (2018); Otiwu, et al., (2018); Bassey et al. (2017); Olaniyi and Evans (2017); Anetor et al. (2016); Egwu (2016); Awotide, et al. (2015); and Ayeomoni and Aladejana (2016) have conducted studies on agricultural finance/credit and economic growth.

This study assesses the overall relationship between agricultural credit, financial inclusion, and GDP in Nigeria in compliance with BOA's business policies. It will be simpler to comprehend how agricultural credits, financial inclusion, and growth are related because they are all instruments for financial inclusion and coexist concurrently in the same country.

Research Gap

The literature reveals several significant gaps that warrant attention. They include but not limited to inadequate Examination of Institutional Role: The Bank of Agriculture's specific mandate in promoting and expanding financial opportunities, bridging equality, and boosting fiscal progress remains understudied, necessitating a thorough investigation.

Conflicting Findings: Previous studies exhibit conflicting conclusions concerning the link between agricultural credits, access to and use of financial services, and economic expansion, underscoring the need for clarity and precision.

On Causality, it is still uncertain which way finance and growth are causally related. To ascertain the reasons for such an outcome, it is necessary to investigate the interrelationship between the three variables under consideration in the study for Nigeria.

The first, second, and third hypotheses are the following: (1) Bi-directional hypothesis, (2) Unidirectional, and (3) Neutral hypothesis.

Dependent Variable: Most studies have used GDP growth as their dependent variable (Camillus et al., 2019; Adesanya & Ajala, 2018; Okuma et al. & Asomba, 2019). The use of Agricultural Output Growth was minimal among them. The purpose of this study is to apply GDP in the way that most people find most convenient. It is more valuable and practicable to examine the link which access to and use of financial services have with fiscal expansion of the Nigerian economy, than agricultural output due to its (1) complex nature and (2) dynamic structure, especially considering that Nigeria's GDP currently receives a comparatively tiny and diminishing contribution from agriculture. As a result, GDP growth has been selected as the dependent variable

for this study. The inclusion of all economic activity, including that in the industrial, agricultural, and service sectors, in the GDP also impacted the decision.

Explanatory Variables: Prior research examined inclusive finance from the standpoints of availability and utilization. The access variable does not adequately reflect the actual number of services used. The analysis supports the claim made by Olaniyi and Lawanson (2017) that employing the use variable is ideal. The degree to which low-income individuals employed in the agricultural and rural sectors of the economy engage in or participate in financial activities is referred to here as financial inclusion. For this reason, the study's financial inclusion measures included the amount of deposits raised, the number of loans given to borrowers, and the number of bank branches. This viewpoint makes sense because usage of the quantity or volume of credits provided to support agribusinesses gives a more accurate picture of actual funding, the money that is actually made available to agro-entrepreneurs. Borrowers for this purpose readily used the funds for the intended purposes, and the resulting increased productivity is anticipated to have an effect on the economy as a whole.

Time Frame: Neither of the previous studies provided empirical coverage for the time period or scope up to 2021. This research sought to take up the identified research deficits by concentrating on the influence which access to and use of financial services has on the expansion of Nigeria's GDP from 2001 to 2021.

CHAPTER 3: RESEARCH METHOD

Preamble

To examine how the operations of the Bank of Agriculture (BOA) affect the total volume of agricultural loans extended, the extent of financial services coverage achieved, and the ensuing progress and transformation of the Nigerian financial market, this section outlines the study's data features and the research techniques needed for data analysis. A thorough analysis of the many ways to collect trustworthy information about the study and the data availability determined that an ex-post factor quasi-experimental design would be the most effective way to conduct the research. The content has been divided into subsections to explain how the selected approach and design will help this research study achieve its objectives. These sections are declarations of the data sources, synopses of the methods used to gather the data, data analysis, and logical frameworks. Other time series econometric techniques described in this section include the Vector Error Correction Model (VECM), the Autoregressive Distributed Lag (ARDL) co-integration Test, Unit Root Tests, and other methodologies employed in the study.

Additionally, summaries of the various techniques employed by other researchers in earlier pertinent studies they did are included in this section. One of these techniques is the popular Ordinary Least Square (OLS) method. Nevertheless, OLS has faced criticism from a variety of sources. Researchers have created alternative strategies, which they are currently developing and putting into practice, in response to several concerns regarding its discriminatory inclinations and unpredictable nature. After all, a variety of studies have employed similar techniques to differing degrees of success and precision. Many articles and studies mention social and financial integration as a key driver of fiscal expansion (EFINA, 2018; Enorma, 2010). The problem has

garnered a lot of interest because of the high rates of financial exclusion, considering that a substantial proportion of the adult residents in these developing nations is either underserved or unserved (Nwanne, 2015; Nwanko & Nwanko, 2015). This is particularly true in Africa, the Pacific, and the Middle East. This has resulted in significant alterations to business structures, the delivery of financial services, and technological advancements in electronic, internet-based, and digital technologies such as mobile and agent banking. Nigeria and other developing nations have joined the global community in recognising that the development of their banking system is an extremely important and urgent matter, and that failing to do so could worsen the socioeconomic hardship already sweeping the nation.

According to EFINA (2018) and NFIS (2016), in Nigeria, the percentages of the population who are underbanked and unbanked, respectively, were 10.6% and 48.4% in 2017. It was shown that rates were greater in rural areas. The socioeconomic isolation of large portions of Nigerian society has become a severe concern for the country's successive governments (David-West, et al., 2017). Because of this, financial inclusion has been consistently given top priority by consecutive governments, who have also backed a wide range of regulatory reform initiatives, strategies, and programmes nearly all of which are focused on the increasing scope of banking operations in the financial industry. The National Financial Access Plan for Nigeria, was incorporated into a document in 2012 called the NFIS. The strategy aims to achieve 80% and 95% financial inclusion by 2020 and 2024, respectively. The Central Bank of Nigeria's objective, which was to protect the value of the naira overseas and maintain foreign exchange reserves, was different. These expectations were deemed reasonable since financial inclusion facilitates business access to Resources, and support to micro, small and medium-sized enterprises. As a result, productivity will increase, non-oil exports will increase, and the demand for naira will stabilise. Agriculture has

been the main source of income and foreign exchange profits from non-oil sectors since the country earned independence in 1960. The industry is regarded as a major employer of labor, providing jobs for a sizable fraction of the rural population in the nation. The GDP of the nation is also largely derived from agriculture (Ayanda & Ogunsekan, 2012). Many governments saw this as an essential component for fostering development and progress. As a result, numerous financial inclusion initiatives have been launched (Abdullahi & Fakunmoju, 2017; NFIS, 2012). Several of these initiatives date back to the later part of the 1960s. In the 1970s, many programmes and policies were also implemented. Others were then implemented when circumstances required. Among these initiatives, establishing the Bank of Agriculture in 1972 attracted significant attention (Enorma, 2010). The bank was established to support the agricultural industry, ensure a greater flow of reasonably priced credit facilities, and provide a relatively easy gateway to wealth and investment management services for all agricultural value chains, with a focus on micro, small, and medium-sized enterprises (SMEs) (Ayanda & Ogunsekan, 2012). Due to this action, businesspeople should find it simpler to capitalise on the plethora of opportunities in the agriculture sector. Given the bank's half-century existence, assessing its operations' impact on the Nigerian economy's growth is appropriate. As a result of increased investment and consumption, financially secure people are probably more productive (Ashraf et al., 2006). In light of this, the study aimed to determine how agricultural credits, inclusive finance, and fiscal expansion in Nigeria are connected. Nigerians and the government continue to hope that the country's vast agricultural resources and unrealised potential will eventually lead to greater prosperity in the agriculture sector in the near future. Research by Ngong, Thaddeus, Asah, Ibe, & Onwumere, (2022); Osabohien, Adeleye, Alwis, (2020) and Anetor, Ogbechie, Kelikume, & Ikpesu, (2016)

shows that lending more money to the agriculture sector increases output, which in turn spurs growth in the economy.

Nonetheless, there are several factors influencing citizens' living standards. The nation's rapidly increasing population in comparison to its declining food production, the number of urban settlements, shifting tastes and fashions, the rising demand for food, land, and energy sources, environmental pollution, the loss of biological variety, and the effects of environmental degradation are just a few of the challenges facing the world today. These issues are severely damaging the world's limited supply of food and other resources like energy, water, and materials (Alex, 2018, 2012). Despite Nigeria's abundant resources, the country nevertheless experiences uneven income distribution and widening social and economic disparity between the affluent and the impoverished (World Bank, 2022; Sanusi, 2010). Awe & Olawumi's (2012) analysis, which discovered that 10% of Nigerians own more than half of the country's wealth, further illustrated the appalling condition. The National Bureau of Statistics study from 2012, which supported this claim, also showed that despite robust GDP growth, 67.1% of the nation's population was estimated to be living below the poverty line in that year (NBS, 2012). Ironically, economists view GDP growth as "exclusive". Khan (2011) argues that this type of growth is not inclusive since it does not significantly raise people's levels of poverty, work opportunities, or general living standards. Consequently, surveys conducted by UNCTAD (2020), FAO (2018), IFAD (2011), and UNCCD (2011) ultimately promoted the application of agro ecology as a technical competency to maintain food systems and development goals. Studies by Fowowe (2020), Olaniyi (2017), Valentina et al. (2015), and Nwanko and Nwanko (2014) have explored economic growth, the availability of agricultural credit, and financial inclusion in various ways. However, none of them have looked at how agricultural credit programmes impact economic growth in the BOA

operations. This effort seeks to bridge that gap. Moreover, the majority of prior authors who looked into the relationship between inclusive finance and fiscal expansion, especially scholars who published contradicting or ambiguous findings, produced their research, particularly in the works of Erlando et al. (2020), Duc and Anh (2019), and Wakdok (2018). The reference investigation has a foundation thanks to the conflicting results. This study examines the Bank of Agriculture's operations to determine how better access to agricultural finance for farmers can promote long-term inclusive finance and the fiscal expansion of the country's fiscal system. Previous research on the operations of most Agricultural Development Banks (ADB's) worldwide has demonstrated that ADB's can become effective catalysts for economic growth if arranged correctly (Seibel, 2000). This result implies that the government may enhance performance by bringing the State-owned Agricultural Bank back into operation. It is simple and widespread to assume that by promoting long-term economic growth and development, the government and its agencies can strategically regulate ADB operations. Studies revealed that success has been attained in several nations, primarily through the simplification of financial options for a significant portion of the economically active population, especially the vulnerable and impoverished (Cull et al., 2008; Beck et al., 2000). More markets and a more equitable financial system are required to reduce poverty, promote social cohesion, and generate employment. Furthermore, marginalised populations that have access to finance can create bank accounts, save money, and make wise investments.

The goal of this study is to determine how increasing agricultural funding for entrepreneurs encourages longer-term, broader engagement in entrepreneurial activities by economic agents. This, in turn, leads to the expansion and rise of economic activities, which in turn drives progress and prosperity. These study research objectives are first, to examine the effect of inclusive finance

on fiscal expansion in Nigeria; second, to analyse the impact of agricultural credits on economic growth with peculiar reference to the Bank of Agriculture (BOA), and third, to examine the long-run association between inclusive finance, agricultural credits, and economic growth in Nigeria.

The aforementioned research inquiries were addressed by the following research hypotheses;

H_0 : Financial inclusion does not have an impact on economic growth in Nigeria.

H_0 : Agricultural credits; do not have an impact on economic growth in Nigeria through the Bank of Agriculture (BOA).

H_0 : Financial inclusion, agricultural credit, and economic growth do not have any long-run connections in Nigeria.

For the sake of this study, we used easily accessible secondary data to conduct in-depth analyses relevant to our research techniques. We looked at the temporary and permanent co-integration relationships between dependent and independent parameters utilizing the ARDL co-integration approach.

Additionally, the model stability tests used in this study, are based on Hansen and Johansen (1993); Hansen (1992); Brown et al. (1975); and Chow (1960), to assess both long-run and short-run variable reliability. Post-estimation methods include residual autocorrelation, heteroscedasticity, normality, and characteristics related to the observations; they also include selecting certain inconsistencies and determining whether or not the remaining estimated models are normally distributed. The study used the Gross Domestic Product (GDP), a metric based on actual GDP, to measure the variables. It denotes an expansion of the economy. The reason the

GDP is used in this study is that it takes into consideration all economic activities in the real economic sectors of the economy, such as manufacturing, industry, services, agriculture, etc.

Since the quantity of agricultural credit provided in the economy is based on the measure of agricultural credit (abbreviated as AGRCDT), AGRCDT acts as a stand-in for credit to farmers. In this context, financial inclusion refers to the degree of involvement or participation in financial activities, especially concerning the impoverished and less affluent. Three indicators are used in this research to quantify inclusive finance. They are the figure of commercial bank borrowers, the volume of commercial bank deposits, and the number of commercial bank branches. Regarding financial inclusion, they serve as stand-ins.

The expected results after applying the ARDL bound testing approach to co-integration are founded on the consequence that access to and use of financial services, agricultural credit, and economic growth have some beneficial correlations in varied degrees and causal directions (Wonder et al. (2019; Bassey et al., 2017).

Research Approach and Design

The research design is the framework and approach used to look at how the study's variables relate to one another. For the analysis, a retrospective (after-the-effect or ex-post analytic) research design was adopted. Ex-post facto investigations look for connections by assessing the current situation and then looking back in time for likely contributory elements. The aim of this study is to determine whether or not there is a correlation between financial inclusion, agricultural credit, and economic growth in Nigeria using the Bank of Agriculture (BOA) as a specific example. In this research, financial inclusion and agricultural credit are the explanatory variables, whereas fiscal growth represented by real gross domestic product (RGDP) is the response (Measured) variable.

Post-event analysis, Quasi-experimental design, as Ex-post facto research, is often referred to, was used in this study. This approach is a methodical, structured inquiry that does not grant the researcher direct control over the importance and usefulness of the variables included in the study (Velicer & Fava, 2003; Kerlinger, 1973). It is the preferred methodology for this analysis because it enables statistical analysis to establish jurisdiction and investigate the efficacy or influence of specific therapies (Harris et al., 2006). According to Lammers and Badia (2005), quasi-experimental designs, also called non-experimental design methods, imitate real experiments by comparing people from different groups who have similar backgrounds but differ in general attitudes as a direct result of their inherited chronicles.

This research methodology is sound and relevant to our study, just as it is for other social and behavioral researchers whose variables are challenging to control (Sharma, 2019; Bhat, 2015). Worse, because it can assess a cause based on an effect, its technique is thought to perform better than experimental research (Mitchel, 2015; Salkind, 2010). Ex-post facto research is less expensive and time-consuming than the other approaches that are currently accessible, and it also considers the researchers' point of view and makes it relevant to the study (Akinlua, 2019; Lammers & Badia, 2005). This indicates that surveys employing the post-survey design must be completed in a particular order.

However, the ex-post facto research approach has several drawbacks. It is evident that both supporters and opponents of this theory argue that the methodology does not provide researchers with the foundation required to clearly establish a relationship between the competing variables under investigation (Salkind, 2010; Harris et al., 2006; Bevins, 1999).

Nature, Sources, and Scope of Data

The research made use of information extracted from from sources, amongst which are, the Statistical Bulletin of the Central Bank of Nigeria (CBN). This document provided the annual time series secondary data. Consequently, the research relied on and used the time series statistics spanning the years 2001 to 2021. Other sources of reliable information for this study included the World Bank Development Indicators (WDI), the Bank of Agriculture (BOA), and the National Bureau of Statistics (NBS). These, and Enhancing Financial Innovation and Access (EFINA) were among the many sources deemed reliable to collect all the information required for analyzing the parameters used in this study.

The information collected from the above-mentioned sources comprises bank loans to eligible agricultural businesses across all agricultural value chains (primary production, agro-processing, facilities for financing distribution/marketing of agricultural produce, and logistics. This serves as agricultural credit's replacement. Other indicators are the quantity of commercial bank branches, bank depositors, and bank borrowers, as well as the real national income which is a representative for economic growth). The period covered is determined by the data available on the important issues. It also describes the normal timelines for the approval of national financial inclusion plans and the periods that typically precede, coincide with, and follow the adoption of global financial inclusion policies. It is expected that this Outlook would help analyze how agricultural credit and financial inclusion are impacting Nigeria's economic growth.

Time Series Data

Time-series statistics are a useful tool for assessing the features of correlations between the predicted and explanatory variables (Velicer & Fava, 2003). The sources of data heading 2 above

are all comprehensive enough to provide enough, reliable, and relevant information for study. They consist of statistical and historical papers. Data are publicly available on the Internet as well as in books, magazines, and publications. Since the resources are as they are that is, standard operating procedure and convention there is no reason for fear. These technologies allowed users to access the research materials used by other researchers, including Akinwale and Obagunwa (2019), Olaniyi (2017), Marshal et al. (2016), and Enorma (2010). Consequently, time series data were collected for different but related time periods at 1-year intervals, and they were then organised chronologically. It is advisable to gather data in this way since it might reveal connections between the variables under investigation (Velicer & Fava, 2003). Nevertheless, the statistical properties of time series data often contradict the principles of traditional statistical methods. Therefore, in order to analyse time series data, a variety of specific tools and procedures are required (Chedalavada, 2021). It was suggested that time series data be used in this study for three reasons: (1) the time scale; (2) the existence or lack of repeating occurrences; and (3) the capacity to identify exact breaks and transient tags. Lastly, the use of series data in time series modeling processes facilitates the identification, testing, and recommendation of estimate methods.

The model makes use of a variety of distributions, statistics, and regressions, particularly when non-zero constants are included. This approach is especially important for testing unit roots. Unit root tests such as the Phillips-Perron (PP) and Dickey-Fuller Test with Augmentation, also known as ADF Unit Root Test are the techniques employed in this study. Furthermore, the time series chart allows one to visually analyse the data to determine whether or not its mean returns to its initial value; if it does, the data's mean revolves around the median. While a non-zero mean can help you decide whether to include one in your model, statistical estimation should always be based on more than just visual examination. In addition to non-zero mean values, the time series

data may also contain programmed proportions that are comparable to periods. In this case, the time series data show trends across time. The way we build and validate the dependability of time series data is influenced by their temporal trends. Periodic occurrence or recurrence of occurrences is another characteristic of time series data that is displayed in time series graphs. The regular recurrence of the time series data shows that they exhibit a consistent pattern over her sub-year time periods. Time series data can be used for a variety of purposes, such as predicting and inferring future events, elucidating historical findings, formulating recommendations or alternate courses of action, and much more (Eric, 2022). The general goals of modeling time series data are similar to those of modeling panel or cross-sectional data. Nevertheless, the approaches used in time series models need to take time series relationships into account. We choose to utilise the tool because time series data have this characteristic.

This strategy relies on reversing the present value calculation of the time series data, and this forms of the forms the basis of this analytical strategy. Regression estimates such as these are widely used for forecasting in time series econometrics. This approach is consistent with the methodology used in this investigation.

Assessment of Past Research Approaches and Designs

Ordinary Least Squares (OLS)

This method, which is sometimes referred to as least squares approximation (LSA) (Kumar, 2022; Gulve, 2020), illustrates the direct correlation between explanatory and predicted variables. OLS is a general method for evaluating measurements in computations for horizontal regression that depict the relationship between one or more independent measurable variables and a dependent variable (simple or multiple linear regressions). Among the many shortcomings of the

OLS technique are its incapacity to detect errors, pinpoint misclassified errors, and take into consideration concurrent biases (Wonder et al., 2019); Adesanya & Ajala, 2018; Wgwu, 2016); Abiola et al., 2015).

Vector Autoregressive (VAR) Technique

VAR is a subtype of speculative process models that generalises univariate autoregression by permitting multiple times-tamp data (Aptech, 2021). This statistical dummy is employed to illustrate relationships between multiple variables that vary over time. According to Sims (1980), the prototype is successful for systems of equations, arbitrary, and easy to use for multivariate time-stamp data processing. It can also be used for structural reasoning and program analysis. Supporters of this approach argue that variables should be treated equally because they are present at the same time. Therefore, it is not appropriate to rely on the distinction between endogenous and external elements on presumptions (Hernandez-Sanjaime et al., 2021). This approach has been used by several researchers, including Erlando, Riyanto, & Masakazu, 2020; Wakdok 2018; Oyinye et al. 2017; Anetor, Ogbechie, Kelikume, & Ikpesu, 2016; & Marshal, Sanderson, Mcintosh, Kolawole, 2016.

Error Correction Model (ECM) and Co-integration

Davidson and David created the time series regression technique known as ECM in 1981, and it was applied to economics for the first time. It is expected that both short- and long-term behavior are determined by equilibrium interactions between two or more-time series. Yule developed this hypothesis in 1936, and Granger and Newbold did the same in 1974. They both used the technique to determine the impacts over the short and long term (Enns et al., 2014). The

spurious correlation issue was resolved via ECM. Strong evidence for a relationship is frequently found through regression analysis of dependent and independent variables, leading researchers to believe that they have inadvertently discovered a genuine association (Gallo, 2015). This methodology was used and supported by Oyetade et al. (2015); Akpan and Udoh (2015); Agwu (2015); Olarinde and Abdullahi (2014); and Rownson et al. (2012).

Two-Stage Least Squares (TSLS)

When a structure has simultaneous equations, the TSLS test is used; it is sometimes seen as an extension of the two-stage least-squares analysis (Sumargo et al., 2021). Unlike ordinary least-squares, which provide reliable but biased estimates, the two-stage least-squares provide fair and consistent estimators. Different approaches regarding the connections between inclusive finance, agricultural credit, fiscal expansion, and/or related research areas. The techniques employed were as bit as varied as the ones previously discussed, if not more so. Even though the empirical research produced a range of results, most of them used a similar methodology and occasionally even came to the same conclusions. However, in more recent times, there has been a growing and unanimity in favor of ARDL over alternative approaches (Pahlavani et al., 2005).

Autoregressive Distributive Lag (ARDL) Model

In a single-equation framework, autoregressive distributed lag (ARDL) models are frequently used to analyse dynamic relationships with time series data (Kripfganz, 2018). Nkoro and Uko (2016) state that the Simple Linear Regression (or OLS) calculation of the Dynamic Regression (ARDL) model may be biased and inconsistent; same of the Error Correction Model (ECM), where the predicted variable has lag features. This model is used in time series analysis to test for long-term and short-term correlations at the same time (Shrestha, 2018; Nkoro & Uko,

2016). This methodology is used to analyse the data after it has been processed using the several inference methods and diagnostic tests mentioned in the study's introduction. The standard unit root test, the Autoregressive Distributive Lag (ARDL) approach to co-integration test, heteroscedasticity test, the Ramsey Reset test, and the Fully Modify Ordinary Least Square (FMOLS) Model are typically presented after the explanatory data is presented.

The Granger Causality Test, the final stage in this process, is based on the Error Correction Model's result. Before they are all looked at, they are all displayed. Shahbaz et al., (2013) state that before to using the ARDL bound-testing approach for co-integration of long-run relationships, the consolidation qualities of the variables must be examined. Furthermore, it is critical to verify that none of the parameters' data stationarity properties are constant at $I(2)$ or later in the integration process. This assumption, along with the knowledge that the variables are steady and of order $I(0)$ or $I(1)$, is made by the critical bounds (Pesaran et al., 2001).

The well-known unit root tests (ADF, PP, and KPSS) all include variables that are $I(1)$, suggesting that there is no risk when using the ARDL technique. Lag selection for models is often computed using the Schwartz Bayes Criterion (SBC) and the Akaike Information Criterion (AIC). These two were chosen because the results are trustworthy even with small sample sizes (Sbia et al., 2017). Features to mitigate the effects of measurement mistakes and omissions on variables are incorporated into the ARDL approach. The Engle and Granger, Johansen, and Juselius tests are among the alternative single cointegration methods that many academics prefer over the ARDL model. Numerous theories have been put forth by academics to explain this. They first state that it is possible to ascertain if the variable is $I(0)$, $I(1)$, or a combination of the two (Pesaran, et al., 2001). Second, it is possible to assess long- and short-term variables at the same time. Thirdly, despite remote framework components, the constrained testing strategy produces near-neutral

long-run estimates and valid t-statistics (Narayan & Smyth, 2005). This allows the model to avoid the issues that arise from applying the Engle-Granger methodology to evaluate the same coefficients throughout time. ARDL is preferred over alternative methods for integrating short-run adjustments into long-run equilibrium without erasing long-run data. This is because a simple linear transformation can be used to pair it with an error correction model (ECM) (Pesaran & Shin, 1999). Lastly, Pesaran and Shin (1999) assert that co-integration correlations in small samples can be analytically found using ARDL action plans, similar to the co-integration methodologies of Johansen (1991) and Juselius (2006). This model is well-suited for this study due to its assumption to achieve the research objectives.

ARDL Co-Integration Analysis

The study comprises computing, tracking, and evaluating the F-statistics relationship to the upper-bound critical values. This ratio, also called the Variance ratio, F-score, or F-test statistics figure is over the critical upper bound and is high. According to the criteria, the conventional significance levels of 1%, 5%, and 10% indicate the existence of co-integration (Narayan, 2005). Based on the assumptions outlined in the first chapter and restated in this chapter, we adopt the alternative hypothesis and reject the co-integration null hypothesis. A lower F-statistic indicates the rejection of the alternative hypothesis and the lack of co-integration while maintaining acceptance of the null hypothesis.

ARDL Long Run Analysis

The next step is to utilise the same lag length selection criteria used in the ARDL model specification, such as the Akaike information Criterion (AIC) or Schwarz Bayesian criterion (SBC),

as suggested by Narayan (2005) and other related studies, to estimate and analyse the long-run and short-run findings.

ARDL Short Run Analysis

After establishing the long-term impacts, the following stage involves analysing the short-term dynamics of financial inclusion, agricultural loans, and economic growth. In this case, the error correction model (ECM) is applied.

ARDL Model Stability Test

Results of stability tests, such as the CUSUMSQ and CUSUM tests, have been reported. The CUSUMSQ test is based on recursive regression residuals and integrates short-run dynamics into long-run residuals. Model breakpoints are used to illustrate statistics that are updated recursively. If the coefficients fall below the 5% significance level, they are considered stable, otherwise, they indicate instability.

Fully Modified Ordinary Least Square (FMOLS) Model

This study investigates the resilience of the ARDL long-run coefficient using Fully Modified Least Squares (FMOLS). The conclusions drawn from the long-run FMOLS model coefficients and the ARDL coefficients are similar, despite possible discrepancies in signs and magnitudes. Moreover, the long-run effects of the variables appear to be more substantial because the ARDL magnitudes are generally smaller than the long-run FMOLS coefficient magnitudes.

Granger Causality Based on Vector Error Correction (VECM) Model

For example, causality in at least one direction is suggested if co-integration is shown and all variables are $I(1)$. Consequently, the direction of the causal chain is ascertained by performing a Granger causality test on VECM. By rendering all variables endogenous, VECM not only directs causation but also discerns between long- and short-term Granger causality.

Traditional Unit Root Test Results

Initial testing for stationarity was conducted using the Augmented Dickey-Fuller (ADF) test (Dickey & Fuller, 1981), as well as the Phillip and Perron (PP) test (Phillips & Perron, 1988), and Kwiatkowski et al. (1992) tests. These tests both, constitute the first stage of the procedure. It must pass this test if the mean-variance and covariance are time-invariant (stationary). A variable is said to be "stationary" if its variance, covariance, and mean are all time-invariant. This test is necessary to ascertain the series' level of integration. It also aids in avoiding incorrect results. The ARDL model is based on the $I(2)$ series, pure $I(0)$ or pure $I(1)$, or the mutual co-integration of the two, as in (Pesaran, et al., 2001). It should be noted that the null hypothesis of any stationary series cannot be demonstrated to be incorrect (Kumar, 2021). Nevertheless, according to Kwiatkowski et al. (1992), none of the series in ADP and PP are stationary. Thus, it is impossible to refute the unit root null hypothesis.

Descriptive Statistics

Once the stationary nature of the variables has been established, an explanatory demographic and correlation construction should be conducted. The Jarque-Bera test statistic

indicates that all variables, with the exception of the square term of the financial development index, $FD2_t$, are determined to be normally distributed.

Evaluation of the Working Hypotheses

It is critical to keep in mind the study hypothesis from chapter one in order to conduct a thorough review at this point. At this point, it might also be appropriate to evaluate the study's findings' implications for policy.

Summary

The National Financial Inclusion Strategy (NFIS, 2018, 2016, 2012) states that the country is not on pace to meet its objectives by 2024. The National Financial Information System (NFIS) has established two objectives for financial inclusion in 2020, including the percentage of adults who are financially included should be 80% overall, 70% in the formal economy, and 10% in the unorganised sector. In 2016, just 48.6% of Nigeria's 96.4 million adult population made use of official financial services, out of 58.4% who had access to them. These objectives are regularly assessed, along with many other key performance indicators (KPIs). Nigeria fails to achieve its inclusion targets in each of these areas (NIFS, 2018). Nigeria's financial inclusion policy still faces several obstacles. Because of this, the nation is far from achieving its financial inclusion goals and ambitions (NFIS, 2018). Therefore, this study aims to assess the influence of broadening financial access from 2001 to 2021. This facilitates the assessment of the effect of accessibility and usage of financial services on Nigeria's expansionary trajectory by using the three main financial inclusion targets as a baseline. As a result of this assumption, the effect of financial inclusion on Nigeria's economic progress is examined. In light of the aforementioned, the primary goal of the study is to impartially investigate how agricultural credits and financial inclusion affect Nigeria's

economic growth. Secondary data analysis was applied quantitatively in this investigation. To ensure the validity of the analysis, preliminary tests are conducted using the Phillipd-Perron and Augmented Dickey-Fullerunit Root tests. The study employs the ARDL bound testing approach, as developed by Pesaran et al (2001), to determine the order of integration. Causal relationships, and both short- and long-term dynamics between financial inclusion, agricultural credit, and economic credit, determinants are examined using the Granger causality test, and Vector Error Correction Model (VECM). Finally, post-estimation diagnostics are performed to check for heteroscedasticity, residual autocorrelation, and normality.

Population and Sample of the Research Study

When utilising ex-post-experimental methods to examine the connections among inclusive finance, agricultural loans, and expansion of the Nigerian economy, time-series data is very effective (Hamilton, 1994; Granger, 1989; Box & Jenkins, 1970). This technique was found to be highly relevant as it provided adequate insights into the research inquiries mentioned in chapter one of the study. The approach of the investigation included the use of secondary data. Secondary data collection was employed in this report to meet the objectives of the study project. This and other important variables related to data extraction and identification, the benefits of the collected data, and a succinct description of the chosen data analysis methods were used to construct the material in this section.

Collection of Secondary Data

Hox and Boeije (2005) recommend that when conducting research with social science research issues, secondary data be used. According to him, researchers need to get secondary data from official statistics, administrative files, or other accounts maintained by public or private

organisations in order to use it in their research. The GDP of Nigeria, the quantity of agricultural loans and advances (credit) that banks have given to the private sector, and the measure of inclusive finance which includes the branch banking network, deposits that banks accept, and borrowers that are listed on their books are all required for this study. All banks are required to submit these statistics, which are recurring data, to the Central Bank of Nigeria regularly. CBN collects and keeps information as primary data by its sheer existence. However, this data is now covered in this research as pre-collected data in compliance with Hox and Boeije's 2005 guidelines.

Source and Scope of Data

The main information sources for this study are the government data archives. The data in these archives is updated on websites that list the data's sources and is maintained electronically. The data catalogs on the variables listed above for this study were provided by the World Bank Development Index (WDI), Bank of Agriculture (BOA), NBS - the Statistical Office of the Government, and the Apex Bank (Nigeria's Monetary Authority). In-depth details on the topic that generated the data as well as the variables mentioned and many more are included in the catalog. All of the previously stated data sources provide periodic historical, statistical, and documentary evidence of the activities of these organisations (Bryman, 1989). These are the top four Nigerian institutions that are currently acknowledged as reliable collaborators in providing individuals with this kind of information at no cost over the Internet or (2) as a book; or (3) as a journal or newspaper. The data and information records for the dependent and independent variables were accessed from the corresponding websites. Olaniyi (2017) conducted a similar study. Several researchers used the same or similar sources, including Marshal, et al. (2016).

The information is freely accessible on the internet and was found using the information gateways indicated in table 1 below. Moreover, we were able to use general search engines like Google to compare data from different sources.

Table 5: Source of Data

Name	Internet Sources	Data
WDI	Using https://data.worldbank.org , access the World Bank data bank.	World Bank Statistical Bulletin, GDP at 2010 Constant Basic Prices and Agricultural Credit
CBN	Central Bank of Nigeria (CBN) https://www.cbn.gov.ng)	World Bank Statistical Bulletin, GDP at 2010 Constant Basic Prices and Agricultural Credit
NBS	The Nigeria Bureau of Statistics Website; www.nigeriastat.gov.ng	On a quarterly and annual basis, statistics on range range of social and economic variables are available in Nigeria
BOA	Yakubu Gowon Way, Kaduna, Nigeria, 1 BOA Library and yearly basis.	Agriculture loans are disbursed on a quarterly

Source: Adopted from WDI: <https://data.worldbank.org>, CBN: <https://www.cbn.gov.ng>, NBS: www.nigeriastat.gov.ng. BOA: Yakubu Gowon Way, Kaduna, Nigeria, 1 BOA Library

Studies conducted in the past, in which several authors successfully and satisfactorily used various data sample sources, have been documented in contemporary literature. Using these sources, researchers have evaluated the sources' sample procedures and found them to be trustworthy, including Wonder et al. (2019); Wakdok, (2018); Bassey, Amenawo, & Enyeokpon (2017); and Marshal, Sanderson, Macintosh, Kolawole, 2016. This study, using 21-year data (2001 - 2021), explores how financial inclusion and greater support for the agricultural sector affect the expansion of the Nigerian economy. This study used 20 years (2001 - 2021) data to explore the period before and after the anticipated implementation of global financial inclusion and Nigeria's and other countries' acceptance of it. The variables' information from these sources is fairly precise and provides enough specifics on the actual Nigerian population using formal financial services to

demonstrate the extent of financial inclusion. Reports from all parties with an interest in the financial industry are regularly compiled by the research's primary sources.

Data Features

The National Income or Gross Domestic Product (GDP), Agricultural credit (AGRCDT), and Financial Inclusion which is based on the quantity of Commercial Bank Branches (CBB), Deposits with Commercial Banks (DCB), and Borrowers from Commercial Banks (BCB) are among the time series data on which the annual statistics are mentioned. To estimate and measure the variables, the study used Real Gross Domestic Product (RGDP), a metric based on real GDP. It serves as a proxy for economic growth. GDP was selected as the measure of economic activity because it includes all sectors of the economy, such as manufacturing, services, and agriculture. Furthermore, the AGRCDT serves as a national stand-in for credit extended by all licensed banks to all agricultural enterprises, as well as the benchmark for agricultural loans. On the other hand, the phrase "financial inclusion" in this context refers to the level of engagement or participation in financial matters, which primarily affects low-wage people. Three measures are used to quantify access to and use of financial services: the volume of loan holders or borrowers, and deposit accounts), as well as the density and spread of service outlets.

Coverage of Unmeasured Variables

In this analysis, agricultural credit, financial inclusion (using CBB, DCB, and BCB as proxies), and economic growth (RGDP) are the three most significant variables. The study's findings needed to be generalised, so secondary data for every variable was collected for the years 2001 to 2021. This sample size seems fair when using the ARDL methodology, which is recognised to be capable of handling small samples of this kind (Haug, 2002). As a result, the study's breadth will enable us to produce enough data to address the research questions and meet the study's objectives. Reasonable steps have been taken to address the possibility of include

superfluous materials and statistics, as advised by Hakim (2000) while also making sure that there is enough data collected over a significant amount of time for analysis.

Advantages and Limitations of Several Data

Many scientists opt to use secondary data in ex-post-experimental research methodologies for a variety of reasons. This is because secondary data (1) can save a significant amount of time and money (Ghauri & Grønhaug 2005). Researchers can now work with big datasets thanks to this. The project's data pertain to the years 2001–2021, and it promises to provide easily accessible, non-invasive treatments for urgently required research (Stewart & Kamtheins, 1993; and Cowton, 1998). In particular, the study uses several pre-existing datasets from WDI, CBN, and NBS. As in other developing countries, the Freedom of Information Act (FOIA) of 2011 has reinforced the legal access to information maintained by public entities (WDI, CBN, and NBS). Consequently, inquiries possess the entitlement to unimpeded entry to documented information maintained by governmental entities. This holds importance for our study as it may yield unforeseen findings. The data collected is also persistent, accessible, and easily verifiable by other individuals. This suggests that the data and findings are accessible to the general audience. All secondary data sources have some restrictions, despite their benefits. This study is not subject to the risk that secondary data will be collected without your requests being taken into consideration. Potential and trends are determined using the data acquired from the aforementioned sources. It is unfounded to worry, as Denscombe (2007) does, that the data might have been collected for a purpose other than this study goal. Second, it's been reported that obtaining secondary data could be costly and difficult, especially if the information was acquired for commercial gain. If the requested report is not in the library, it is rarely freely accessible online. According to Nederpelt and Daas (2012), there is a possibility that secondary data found in published reports is not appropriate for definition

and aggregation. Although aggregation satisfies the requirements of the first research, it is deemed wholly inappropriate for the present investigation. Furthermore, in cases where merging data sets is the goal, definitions could differ greatly or have evolved. Alternatively, the records might not accurately reflect an objective reality, but rather the author's perception. In this study, this was not the case.

Thirdly, many secondary data sets made public by governments and data repositories are of a greater quality than what individuals can gather independently, though this is not always the case. Consequently, we employed the F-statistics methodology recommended by Pesaran et al (2001), while ensuring that the data sources were carefully reviewed. For all of these reasons, it was crucial to carefully display the study's data to ensure that it contributed to the resolution of the research question and the achievement of the objectives. Numerous validity and reliability checks were conducted to confirm the sufficiency of the secondary data used in this study. Since this study is being conducted under ARDL and deals with $I(2)$, it is important to ensure that the model is suitable. As a result, the F-statistics proposed by Pesaran et al. (2001) would seem strange and useless in this context. The Phillips-Perron and Dickey-Fuller tests, two common stationarity techniques, were applied. To assess the long-run equilibrium connection between Agricultural Credit and its determinants, including GDP, inclusive finance, and Fiscal expansion, the Dynamic Least square (also known as the Autoregressive Distributed Lag (ARDL) bounds testing) approach is employed. According to the proponents of ARDL, the technique offers several benefits over other single co-integration techniques. It is preferred by researchers for following reasons. First, according to Pesaran et al. (2001), it is relevant regardless of whether the variables are $I(0)$, $I(1)$, or both. Second, estimates of the long-run, and short-run meters are made simultaneously. Thirdly, even in cases when a portion of the model's regressors are endogenous, the bounds-testing

approach usually yields reliable t-statistics and objective long-run estimates (Narayan, 2005). This suggests that the endogeneity problem with the Engle-Granger coefficient estimation method is resolved over time. Fourth, the Error-Correction Model (ECM) can be formulated using the ARDL approach. Simply put, the ECM is developed within the ARDL framework, (Pesaran & Shin, 1999). Fifth, the ARDL method outperforms the Johansen and Juselius co-integration method in terms of statistical significance for identifying small-sample co-integration correlations (Haug, 2002; Pesaran & Shin, 1999). The ARDL strategy to co-integration generally consists of two steps that involve assessing long-term partnerships. The first step is to look for any long-term correlations between all of the variables (Nkoro, 2016). The next step is to estimate the short- and long-term models (Salisu, 2016). Furthermore, the Phillips-Hansen Estimator (also called FMOLS estimator) is used to assess the stability of ARDL. This inquiry also employed the Granger (1969) approach to test the hypothesis that x causes y . This method requires first calculating the portion of the present value of y that can be explained by earlier values of x , and then determining whether or not including earlier values of x will improve the explanation of y . If y helps forecast the present value of X , or if the coefficients in the lagged Y 's are statistically significant, then X is said to be Granger induced by Y . Consequently, we construct the lagged error correction term (ECT_{t-1}) from the long-run co-integration relationship and add it as a new independent variable to the equation when co-integration variables are available. To ensure the model's statistical validity, diagnostic tests were conducted, including tests for serial correlation, heteroscedasticity, normality, and ARDL stability, amongst others.

Techniques of Data Analyses

One goal of this research study is to explore the interrelationships among agricultural loans, enhanced financial opportunities, and Fiscal expansion of the Nigerian economy. Additionally, through the Bank of Agriculture (BOA), the study makes an assessment of how agricultural credit delivery affects, accessibility to banking infrastructure and Fiscal expansion of Nigeria's economy. The study also aimed to determine the immediate and long-term impacts of financial inclusion, agricultural loans, and Nigeria's economic development. The study project outlines in detail how its findings will contribute to the corpus of previously published literature on the issue based on these characteristics. It is also hoped that it will act as a guide for anyone wishing to do additional research in this area. Without question, the country's poverty, suffering, and related problems have taken on a horrifying magnitude. Through research of this consequence's impact on financial inclusion (FI) and related factors, the bank's management will be better equipped to re-plan to solve the myriad concerns. Finding the best way to restructure the Bank, increase its efficacy, and aid in the fight against hunger and poverty should be of interest to Nigerian governments and monetary authorities since it is reported that over 40% of the population lacks access to formal financial services. It is anticipated that the research study will provide data that will aid in the creation and implementation of appropriate programs to strengthen Nigeria's financial system. Sustainable financial services must be provided to MSMEs to guarantee that the impoverished, particularly small-scale farmers in rural regions, have easy access to loans and advances. To reduce poverty, it is essential to increase the citizens access to resources to enhance economic growth.

Consequently, the following research questions and hypotheses are developed to support the core plan for selecting appropriate study design, methodology, and procedures. The following significant questions were the focus of the investigation. The first was to find out how financial

inclusion affects Nigeria's economic progress. Second, find out if agricultural credits have influence on Nigeria's Fiscal expansion through Nigeria's Bank of Agriculture (BOA). Lastly, to discuss the potential long-term impact which increased agricultural credits delivery, access to and use of financial services, have on Nigeria's fiscal growth. We took a fundamental approach to examine the contingent relationships between agricultural credit, financial inclusion, and economic growth in Nigeria after reviewing the country's financial sector with an emphasis on the workings of the Bank of Agriculture, the country's principal agricultural financial institution. This study, which covers the years 2001 through 2021, aims to investigate the existing interrelationships between the various ways that agricultural loans and inclusive finance affect expansion of the Nigerian economy.

The information that follows provides specifics on the approach taken to meet the study's goals. The framework is an expansion of previously put forward theoretical and empirical argumentative concerns. This section also covers the methods used to collect and evaluate the data that was obtained as well as the instruments needed for estimate that allow for a thorough examination of the study's variables. Considerable efforts have been made in this work to apply a more reliable and targeted methodology. This study specifically chose to use ADF and Phillips Peron (PP) methodology to ensure the accuracy and validity of results from heteroskedasticity and serial correlation tests. This should assist confirm the catalog's level of stationarity, it is hoped. The same finding was also supported by the following tests to assess the Autoregressive distributed lag (ARDL) using benchmarks for catalog lag, model diagnostics, model stability, the Wald test, the cumulative sum test (CUSUM), and the error correction term (ECM). The study's methodology draws from various sources, including the approaches taken by Onoja et al. (2017), and Ayeomoni, and Aladejana (2016). Back-series statistics containing the actual values of agricultural loans given

to fund important agricultural projects across the industry's multiple value chains provided appropriate information required for the analysis. National income which Real Gross Domestic product, deflated for inflation represented, is the dependent variable. The data, which covers the years 2001 to 2021, is taken from the Central Bank of Nigeria statistics bulletin on several subjects. As a tool for analysis, E-views statistical software is employed. Consequently, this section includes an outline of the data description as well as the data analysis process. This section offers supplementary discussions on the time series econometric methods, including unit root testing, ARDL cointegration analysis, and the data description.

Model Specification

After a brief review of several theories related to the economic growth hypothesis, it is clear that all financial inclusion initiatives targeted at bolstering the domestic economy are essential and directly affect the rate of economic expansion. These theories include the slow growth model, neo-classical growth, and endogenous growth theories. The information that follows now addresses the definition of the empirical model for assessing the causal association among the parameters, accessibility of financial infrastructure, agricultural loans, and the growth of the Nation's economy. These, in addition to endorsing the connection between them. Chindo et al. (2015) and Emran et al. (2008) assert that the ARDL methodology can be utilised to simultaneously compute equilibrium (long-run), and Temporary (short-run) coefficients. Throughout the years, the long-run co-integration connection between the variables has been examined using the ARDL methodology. To ascertain the short-run dynamic, it was also utilised in the construction of the ARDL standard's Error Correction version (ECM).

This approach provides additional proof to back up their conclusions. For this investigation, the ARDL's econometric representation is as follows: -

$$GDP_t = \alpha_0 + \alpha_1 AGRC DT_t + \alpha_2 CBB_t + \alpha_3 DCB_t + \alpha_4 BCB_t + \varepsilon_t \quad (3.1)$$

The econometric expression in equation 3.1 above includes the error term (ε_t); This was added to the instrument to take into consideration the effects of the other factors that were left out. It also discusses the potential impact of measurement errors on the dependent variable. This parameter is thought to have an independently identical, regularly distributed zero mean and constant variance [*i. e.* $\varepsilon_t \sim NIID(0, 1)$].

The variables are converted into natural fractions to produce a valid result. Thus, the empirical equation was formulated as follows:

$$\ln GDP_t = \alpha_0 + \alpha_1 \ln AGRC DT_t + \alpha_2 \ln CBB_t + \alpha_3 \ln DCB_t + \alpha_4 \ln BCB + \varepsilon_t \quad (3.2)$$

Where

$\ln GDP_t$ = Gross domestic product

$\ln AGRC DT_t$ = Agricultural Credit

$\ln CBB_t$ = Commercial Bank Branches

$\ln DCB_t$ = Deposit with Commercial Banks

$\ln BCB_t$ = Borrowers from Commercial Banks

ε_t = is the error term

$\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4$, and α_5 , are the parameters to be estimated whereas, the a priori expectations are $\leq > 0$.

It is critical to acknowledge the possibility of false regression. This event not only greatly aided in the development of modern time series econometrics, but it also influenced the creation of certain techniques that are now used in applied macroeconomics. This work avoided any limitations in the handling of any simulated regression in non-stationary time series by using the unit root and co-integration technique, as in (Granger & Newbold, 1974). It's a tried-and-true way to make sure there is no false regression. On the other hand, it is asserted that these techniques are often unpredictable, mostly due to specification decisions made on the autoregressive lengths, deterministic section selection, innovation process distribution, and structural breakdowns. Spurious regression is arguably the most important factor that motivated Granger and Newbold to develop new time series econometrics. These occurrences have been known to economists since Yule (1926) provided an explanation for it in terms of missing variables. Granger and Newbold (1974) demonstrated that, even in the absence of missing variables, non-stationary time series exhibit incorrect regressions.

Most time series are better described by non-stationarity, according to Nelson and Plosser (1982). Spurious regression is largely responsible for the development of modern time series econometrics and gave rise to many of the instruments used in applied macroeconomics. However, most of the research indicates that non-stationarity is the only factor that can lead to misleading regression. Researchers frequently employed unit root and co-integration tests to get around the issue of erroneous regression brought on by non-stationarity. Although spurious regressions resulting from non-stationarity make it extremely difficult to draw valid findings, unit root and co-integration tests are employed as a workaround. No unit root test exists that is both compact enough and performs well on tiny samples.

Prior to applying the unit root and co-integration techniques, a number of specification choices must be made, including the lag time, trend, structural stability, and other factors. It is unnecessary to run a large number of tests if the decision is based on the data. Specific statistical errors that pertain to every test are known as type I and type II errors. Due to the cumulative risk of error across all tests, the results are not entirely reliable. These factors account for the literature's continued underdevelopment even after four decades of fruitless research. There is a widespread misperception that incorrect regressions can only be caused by unit roots. Nonetheless, the absence of the pertinent variable is one of the primary causes of erroneous regression. Additionally, it was shown that missing variables contributed to the erroneous regressions in the Granger and Newbold (1974) experiment (see Section 5.1). Thus, taking a fresh look at the spurious regression problem and moving even further to ARDL while keeping the missing variable in mind. Let us examine the situation when two distinct autoregressive non-stationary series exist.

Unit Root Test

First, run a stationarity test. This test is used in the research project to determine if time series data are stationary. If the average and dispersion of a series are time-invariant, the series is called stationary. Non-stationary variables have a mean and variance that fluctuate over time. According to Johansen (1991, 1988), a non-stationary variable can become stationary by differencing (changing) k times. In this scenario, the variable is known as an integrated of order k , or $I(k)$. $I(0)$ thus gives the row that should not be differentiated. In the current work, he employs ADF and PP to determine the order of the variables' integration, whereas other scholars have used a range of unit root tests.

Augmented Dickey Fuller (ADF) Test

ADF Test is a commonly used tool by statisticians to assess whether or not given data series are stationary. This tool, among other techniques being used to investigate serial stationarity, is probably, the most frequently used procedure. Currently, only two methods exist for analysing stationarity. The first step is to manually examine the mean and variance of a stationary time series which remain constant over time. The second option is the ADF Test feature. It is known that the mean and variance of static time series do not change over time. This results in the data length being divided into two equal lengths. It compares the divided data's variance or mean. The ADF test employs the null and alternative hypotheses, leading to the calculation of statistics and the determination of p-values. It is feasible to determine whether or not a certain time series is stationary using statistical tests and p-values.

For the purposes of this study, let us consider the stationary in AR (2) test.

$$Y_t = \phi_1 Y_{t-1} + \phi_2 Y_{t-2} + \varepsilon_t \quad (3.3)$$

$$Y_t - Y_{t-1} = \phi_1 Y_{t-1} Y_{t-1} + \phi_2 Y_{t-2} + \varepsilon_t \quad (3.4)$$

$$\Delta Y_t = (\phi_1 - 1) Y_{t-1} + \phi_2 Y_{t-2} + \varepsilon_t \quad (3.5)$$

$$\Delta Y_t = (\phi_1 - 1) Y_{t-1} + \phi_2 Y_{t-2} + \varepsilon_t \quad (3.6)$$

$$\text{Add } +\phi_2 Y_{t-1} - \phi_2 Y_{t-1} - \text{Locate on the right-hand side of equation} \quad (3.7)$$

$$\Delta Y_t = (\phi_1 - 1) Y_{t-1} + \phi_2 Y_{t-2} + \varepsilon_t + \phi_2 Y_{t-1} - \phi_2 Y_{t-1} \quad (3.8)$$

$$\text{Collect the like terms in equation} \quad (3.9)$$

$$\Delta Y_t = (\phi_1 - 1) Y_{t-1} + \phi_2 Y_{t-1} - \phi_2 Y_{t-1} + \phi_2 Y_{t-2} + \varepsilon_t \quad (3.10)$$

Rearrange equation (3.10) base on the like terms

$$\Delta Y_t = (\phi_1 + \phi_2 - 1)Y_{t-1} - \phi_2(Y_{t-1} - Y_{t-2}) + \varepsilon_t \quad (3.11)$$

Since $(Y_{t-1} - Y_{t-2}) = \Delta Y_{t-1}$

$$\Delta Y_t = (\phi_1 + \phi_2 - 1)Y_{t-1} - \phi_2 \Delta Y_{t-1} + \varepsilon_t \quad (3.12)$$

Let $\phi_1 + \phi_2 = \rho$; such that if $\rho = 0$ meaning $\phi_1 + \phi_2 = 0$ then there is unit root otherwise, it does not contain unit root. The three ADF equations can be writing as follows:

$$\Delta Y_t = \mu + \delta_t + \rho Y_{t-1} \sum_{i=1}^{\rho-1} \bar{H}_i \Delta Y_{t-1} + \varepsilon_t \quad (3.13)$$

$$\Delta Y_t = \mu + \rho Y_{t-1} \sum_{i=1}^{\rho-1} \bar{H}_i \Delta Y_{t-1} + \varepsilon_t \quad (3.14)$$

$$\Delta Y_t = \rho Y_{t-1} \sum_{i=1}^{\rho-1} \bar{H}_i \Delta Y_{t-1} + \varepsilon_t \quad (3.15)$$

$H_0: \delta = \rho = 0$ (Unit root with no time trend)

$H_a: \delta \neq 0, \rho < 0$ (Trend stationery)

Phillips-Perron (PP) Test

A statitica test often used as an alternative to ADF test. It is used to determine degree of integration and the steady state estimation of the variables under consideration. Using the Newey West covariance matrix estimator, Phillip Perron (PP), which is more powerful and resilient than ADF, derives its robustness from serial correlation and heteroscedasticity (Phillip & Perron, 1988). The following formula is used to provide the test: -

$$Y_t = \omega + \rho Y_{t-1} + \varepsilon_t \quad (3.16)$$

$$Y_t = \omega + \rho Y_{t-1} + \delta_t + \varepsilon_t \quad (3.17)$$

It is possible to execute unit root tests without a consistent or deterministic trend, as the ADF unit root test demonstrated. According to Phillips-Perron (1988), tests cannot be run without

a deterministic trend, nevertheless. This is because deterministic or consistent trends, or a mix of the two, should be included in the test.

The test statistics is given as follows:

$$\bar{Y}_p = y_p(y_0/f_0)^{1/2} - \frac{Y(f_0 - y_0)(se(\hat{\rho}))}{2f_0^{\frac{1}{2}}S} \quad (3.18)$$

Where $se(\hat{\rho})$ is the coefficient se, S is the use of the test regression, and y_0 is the y ratio of f_0 while f_0 is an estimator of the spectral density at frequency zero, y_0 is a constant estimate of the error variance. Because it accounts for serial correlation and heteroscedasticity, this test is a step up from the ADF test. The hypothesis is tested as follows;

$H_0: \delta = \rho = 0$ (Unit root with no time trend)

$H_a: \delta \neq 0, \rho < 0$ (Trend stationery).

ARDL Model Stability Test

Having established that the series was free from serial correlation, the study utilised the Ordinary Least Squares (OLS) regression to estimate the model parameters, which were then used to compute the cumulative sum test (CUSUM) test statistic for detecting structural breaks. The CUSUM test is be used to confirm that the series is changing direction. If the variables erratically deviate from the bound line, changes should be observed at a sufficient significance level of 0.05%. If the series is outside the bounds, the model is unstable since it is not significant. In contrast, the series is regarded as statistically significant and demonstrates the stability of the model if it falls between the bound lines. Bahmani-Oskooee and Chomsisengphet (2002) state that the presence of co-integration deduced from the equation does not imply that the estimated coefficients are stable. Many studies have looked into the stability of regression equation coefficients (Hansen & Johansen, 1993; Hansen, 1992; Brown, Durbin, & Evans, 1975, Chow, 1960). The Chow stability

test necessitates prior knowledge of structural failures occurring within a specified time range and has well-documented limitations (Gujarati, 2003). An $I(1)$ variable is required for the stability test and long-run parameter consistency in the Hansen and Johansen (1993) and Hansen (1992) techniques. However, they fail to account for the short-run dynamics of the model, as noted by Bahmani-Oskoui and Chomsisengphet (2002). The recursive regression residuals form the foundation for the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMSQ) stability tests, first introduced by developed by (Brown, Durbin & Evans, 1975). In these tests, the short-run dynamics are also taken into account by the long-run dynamics through residuals. The iteratively updated CUSUM and CUSUMSQ statistics are compared to the model breakpoints. When the plots of these statistics are within the critical significance limits of 5%, the coefficients for a given regression can be considered stable. Usually, a graphical depiction is employed to carry out these assessments (Halicioglu, 2007).

Vector Error Correction (VECM) Techniques

Errors in transmitted signals can be found, fixed, and reversed using the VECM methodology. The purpose of this exercise is to make sure that the updated messages are available to the recipient and are sent successfully. However, it can only be used in situations where there is evidence of long-term interactions between the non-stationary variables. The error correction mechanism (ECM) assumes the equitable route of variable Y_t . Long-term pathways created by long-term causality are modified in the short term.

The following is the equation for the error correction model: -

$$\Delta \ln GDP_t = \alpha_2 + \sum_{i=1}^n \beta_{2i} \Delta \ln GDP_{t-i} + \sum_{i=0}^n \gamma_{2i} \Delta \ln AGRCDT_{t-i} + \sum_{i=0}^n \delta_{2i} \Delta \ln CBB_{t-i} + \sum_{i=0}^n \theta_{2i} \Delta \ln DCB_{t-i} + \sum_{i=0}^n \varphi_{2i} \Delta \ln BCB_{t-i} + \Omega ECT_{t-1} + \varepsilon_{2i} \quad (3.21)$$

Where Ω represents the speed of adjustment of the variables towards their log-run equilibrium on an annual basis. The ECT_t is defined as:

$$ECT_t = \ln GDP_t - \alpha_1 - \sum_{i=1}^n \beta_{1i} \ln GDP_{t-i} - \sum_{i=0}^n \gamma_{1i} \ln AGRCDT_{t-i} - \sum_{i=0}^n \delta_{1i} \ln CBB_{t-i} - \sum_{i=0}^n \theta_{1i} \ln LDCB_{t-i} - \sum_{i=0}^n \varphi_{1i} \ln BCB_{t-i} \quad (3.22)$$

Granger Causality Test

A technique for figuring out the order of two parameters in a time series is called Granger causality (Learner, 1985). This approach is selective about which variables are prioritised above others and uses useful information to support the type and location of associations. While causality and the "cause and effect" phenomenon are not the same, they are comparable. Causality is to identify which time series variables appear before others. To investigate the direction of causality between variables, the Granger causality test was employed. This test assesses whether the dependent variable is endogenous, meaning its value is influenced by other variables. The results were evaluated based on the p-value, which indicates the probability of observing the test results under the null hypothesis, which states that there is no significant difference between the coefficients of the independent variables and zero. You can, therefore, conclude that the independent variable does not granger-cause the dependent variable if the null hypothesis is rejected. If the p-value for Y_t , the independent variable in the equation, is significant at the 5% level (i.e., $H_0: \beta_i \Delta L \neq 0$, is rejected at a 5% significant level where i relates to Y_t), we can assume that there is a short-run causal impact from Y_t to X_t .

The ARDL methodology, according to Boutabba (2014) looks for co-integration links between variables regardless of whether they are present. It does not seek the direction of the causal chain in any way. If there is no cointegration among the variables, the Granger causality test is specified using vector autoregression (VAR) on first difference form. However, if co-integration is found, the one-period lagged error correction term ((ECT-1)) will be added to the augmented Granger causality test model. This is important because Engle and Granger (1987) noted that if the series are integrated of order one (1(1) and cointegrated, the Vector autoregression (VAR) should be estimated in the first difference, but with an added error correction term to account for the long-run relationship. In multivariate qth order of the VECM model, the expanded form of the Granger causality test with ECT is expressed as follows: -

$$\begin{aligned}
 (1 - B) \begin{bmatrix} GDP_t \\ AGRCDT_t \\ CBB_t \\ DCB_t \\ BCB_t \end{bmatrix} &= \begin{bmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \\ b_5 \end{bmatrix} + \sum_{i=1}^q (1 - B) \begin{bmatrix} c_{11,t} & c_{12,i} & c_{13,i} & c_{14,i} & c_{15,i} \\ c_{21,t} & c_{22,i} & c_{23,i} & c_{24,i} & c_{25,i} \\ c_{31,t} & c_{32,i} & c_{33,i} & c_{34,i} & c_{35,i} \\ c_{41,t} & c_{42,i} & c_{43,i} & c_{44,i} & c_{45,i} \\ c_{51,t} & c_{52,i} & c_{53,i} & c_{54,i} & c_{55,i} \end{bmatrix} \begin{bmatrix} GDP_{t-1} \\ AGRCDT_{t-1} \\ CBB_{t-1} \\ DCB_{t-1} \\ BCB_{t-1} \end{bmatrix} + \\
 \begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \\ \delta_5 \end{bmatrix} [ECT_{t-1}] &+ \begin{bmatrix} \gamma_{1t} \\ \gamma_{2t} \\ \gamma_{3t} \\ \gamma_{4t} \\ \gamma_{5t} \end{bmatrix}
 \end{aligned} \tag{3.23}$$

Where $(1 - B)$ is the lag operator, and ECT_{t-1} the one-period lagged error-correction term and $\gamma_t S$ is a serially uncorrelated random error term with mean zero and finite covariance matrix. The t-statistic associated with (ECTt-1) indicates the significance of the long run causal influence, whilst the F-test on the lagged explanatory factors can be used to determine the short run causal impacts.

Post Estimation Test

The following tests must be run to determine the model's robustness before doing a post-estimation analysis.

Residual Autocorrelation Test

Autocorrelation measures how dependent the same parameters are between two successive time intervals. It calculates the correlation between a time series parameter's lagged and original values. Autocorrelation, or serial correlation, is a common tool through the application of autoregressive-moving-average (ARMA) and autoregressive-integrated-moving-average (ARIMA) modeling techniques. Recurrent periodic patterns are easily employed in the technical analysis of financial markets with the help of autocorrelation analysis. a circumstance in which the disturbance term associated with one observation influences the disturbance term associated with another.

Stated differently, Gujarati (2006) claims that the current error term is dependent on its past values. It is expressed figuratively as:

$$e_t = \rho e_{t-1} + V_t \text{-----} (3.24)$$

Where:

ρ is the symbol representing Residual Auto-Correlation

When $\rho = 0$, no autocorrelation

$\rho \neq 0$, Autocorrelation is present

To determine if the estimated model's residuals are serially correlated or not, and subsequently to determine whether there is autocorrelation among residuals, the Breusch-Godfrey LM test will be used.

H_0 : There is no serial correlation among the residuals.

H_1 : There is a serial correlation among the residuals.

Heteroscedasticity Test

Heteroscedasticity is the term used to describe the situation when the residual difference swings over a predefined range of measured numbers. The phenomenon of heteroscedasticity causes the residuals, or error term, to be distributed unevenly throughout a regression analysis. The method has various challenges in regression analysis, especially in ordinary least squares (OLS) regression, due to the underlying assumptions. In this case, homoscedasticity the property where all residuals originate from a population with constant variance is assumed. In order to meet the regression assumptions and ensure the reliability of the results, the residuals' variance must remain constant. This is the case when the variance of each disturbance term for the selected explanatory factors varies with time. In other words, it happens when each disturbance term's variances for the chosen explanatory variables are not equal across time. It is given by the following formula: -

$$Y_t = \beta_0 + \beta_1 X_t + \varepsilon_t \text{-----} (3.25)$$

In the context of heteroscedasticity, standard errors of estimates become skewed, and inferences cannot be drawn from the usual t-statistics, F-statistics or LM statistics when the standard errors are skewed. Therefore, this test is used to test whether the estimated model residuals are heteroscedastic or homoscedastic.

Normality Test

Normality tests are commonly used in this type of research to evaluate the accuracy of sampling data, if the sample was drawn from a normally distributed population and if the incident occurred within permissible tolerance bounds. The many statistical techniques utilised in VAR techniques are not always verified by this test, even though it is not commonly used to validate VAR models. Still, residual irregularity can often indicate other problems in the model, such as structural changes or nonlinearities. Apply the Jarque-Bera (1980) statistics to examine whether or not the normality of the estimated model residuals is normally distributed. The hypotheses for the Jarque-Bera can be interpreted as:

H₀: Normality of residuals,

H₁: The residuals are not normally distributed.

Measuring Variables and Apriori Expectations

The study used the Gross Domestic output (GDP), a statistic that is derived from actual gross domestic output. It acts as a substitute for economic growth. The choice was taken because it addresses every facet of the economy, such as the manufacturing, services, industrial, and agricultural sectors. The analysis, however, will treat real economic development as the total of all appropriately compressed economic activities and will not exclude any of the other sectors. Agricultural Credit, or AGRCDT, is a statistic that is based on agricultural loans and advances that are disbursed for all operations in the agricultural value chains. It acts as a substitute for loans to farmers in village settings. For the purpose of this research, inclusive finance is defined as the extend of participation in financial activities, particularly as it relates to low-income earners. Three measures are used to quantify access to and use of financial services: the density of bank services

outlets, the volume of deposits held by Banks, and the number of borrower's accounts being operated. These served as stand-ins for the variables related to financial inclusion.

Table 6: Definitions of Variables and Data Sources

Code	Definition	Sources of Data
<i>cbb</i>	Commercial bank branches	WDI, CBN
<i>dcb</i>	Deposit with commercial banks	WDI, CBN
<i>gdp</i>	Gross Domestic Product	WDI, NBS
<i>bcb</i>	Borrowers from commercial banks per 100,00banksults	WDI, CBN
<i>agrcdt</i>	Agricultural Credits	BOA,CBN

Source: The Researcher's Computation, 2023

Table 7: Description and Measurement of Variables and Priori Expectations

Variables	Description	Measurements	Data source
Agricultural Credit	<i>AGRCDT</i>	Monetary value	CBN (2018) BOA (2001-2018)
Economic Growth	GDP	Gross Domestic Product at 2010 Constant Basic Prices	WDI, EFinA, CBN & NBS (2018)
Financial Inclusion	FI	Commercial Bank Branches Deposits with Commercial Banks (DCB) & Borrowers from Commercial Banks (BCB)	WDI, CBN, NBS, (2018)

Source: The Researcher's Computation, 2023

The variables listed in the sources of information above are defined exactly as they are; their models and priori linkaes are likewise noted above

Summary

As attention was drawn to the poverty and hardship that result directly from financial exclusion in the new millennium, the phrase "financial inclusion" gained popularity (Omar &

Inaba, 2020; Park & Mercado, 2018; Jabir et al., 2017; and Sahay, et al, 2015). The premise behind the creation of the Financial Inclusion Initiative was that all members of society should have convenient access to a variety of economic solutions that seamlessly meet their needs at fair costs. Based on available data, 39.2 million adults in Nigeria (46.3% of the country's 84.7 million adult population) were economically excluded and did not have access to formal or informal funding in 2013. After more research, it is discovered that 54.4% of the excluded populations are women, 73.8% are under 45 years old (working age), 80.4% reside in rural areas, and 34.0% have never attended college. At the time, Nigeria had 28.6 million bank accounts out of 89.7 million adults and over 179 million people (EFINA, 2012). It is evident that Nigeria has not met the 2020 targets stated in the 2012 National Financial Inclusion Strategy (NFIS). Consequently, NFIS again established new goals for 2020. On two goals related to financial inclusion, there was consensus this time. (1) an adult population with the financial inclusion rate of 80%; (2) an adult population with an official financial inclusion rate of 70%. However, just 48.6% of all people in Nigeria used official financial services in 2016, while only 58.4% of the country's 96.4 million adult population had access to them. NFIS established 15 new objectives for channels, products, and enabling environments in 2018 in addition to the 22 KPIs pertinent to the agreed aims.

According to NIFS (2018), Nigeria is lacking in each of these areas. It is evident that the country still faces several obstacles in implementing financial inclusion policies. Consequently, the nation has continuously fallen short of its objectives. In order to investigate the impact of inclusive finance, this research establishes connection between Nigeria's growth process and the primary goals of broad-based financial services. This essay discusses how inclusive finance affects Nigeria's economic expansion. Considering the previously mentioned details, this research has opted to utilise quantitative approaches in order to examine the connections among financial

inclusion, agricultural loans, and economic expansion in Nigeria. The research employed Autoregressive Distributed Lag (ARDL) approach developed by Pesaran et al., 2001, to accomplish this objective. Further techniques needed for additional data analysis include the co-integration test, VECM, diagnostic tests, and a host of others. The authors also suggest post-estimation of residual autocorrelation and the use of heteroscedasticity and normality testing. These strategies were chosen based on the factors mentioned above. Among them are the following: The ARDL can be converted into the ECM using a simple linear transformation (Pesaran & Shin, 1999). The ARDL has the following advantages: It is particularly effective at estimating models under $I(0)$ and or $I(1)$ outcomes. It is also straightforward, easy to understand, and use. It can estimate the parameters with efficiency. Some claim that the ARDL process is a statistically more effective method for establishing co-integration links in small samples. Pesaran and Shin (1999) found that these features outperform the Johansen and Juselius co-integration methods by a significant margin. For a variety of reasons, including this one, the technique has gained more traction than other well-known single co-integration techniques (Abonazel & Elnabawy, 2020; Emeka & Kelvin, 2016).

To evaluate the long-term relationship, the ARDL method of co-integration is commonly applied in two parts. Finding out if there is a long-run equilibrium relationship exist between each variable is the first stage. Estimating long- and short-term situations is the second step. Furthermore, FMOLS is used to assess the stability of ARDL. Again, the Granger (1969) method was applied in this study to determine whether x causes y or vice versa. The technique is used to determine whether adding previous values of x can best explain y or how much of the current value of y can be supported by those values. If y helps predict x 's present value or, if the answer to this question is affirmative, if the coefficients in the lag y 's are statistically significant, then y is said to

have a Granger impact on x . If there is a co-integrating variable, then the lagged error correction term (ECT_{t-1}) from the long-term co-integrating relationship is added to the equation as an additional independent variable. Diagnostic tests are run to verify the statistical correctness of the model. Unit roots and co-integration analysis are the only techniques in traditional econometrics that can stop spurious regressions in the non-stationary case, as was previously shown. Nevertheless, under certain parameters and decisions, such the innovation process distribution, autoregressive lag length selection, deterministic component selection, and structural break... It makes sense to conclude that missing variables (lag values) are almost always the main cause of improper regression after carefully examining the large body of research and conclusions. Therefore, another method to deal with false regression problems is to go back and find missing variables. This promotes the use of the ARDL co-integration technique even more. The assertion that ARDL methods are frequently applied and that they are capable of correcting inaccurate regressions is supported by certain conditions (Abonazel, & Elnabawy, 2020).

CHAPTER 4: DISCUSSION OF RESEARCH FINDINGS

Preamble

The research study's findings on financial inclusion, agricultural loans, and economic growth are covered in this section along with presentations on the reliability, validity, and trustworthiness of the data used and the research methodology. Data obtained by empirical means, and Nigeria's Bank of Agriculture. The goal of the research was to investigate the impact which greater access to agricultural credit for entrepreneurs relates to long-term financial inclusion and the country's Fiscal expansion. As part of this inquiry, the study investigated the potential effects of increasing agricultural loans on inclusive growth and Fiscal expansion. Using time series data, and ex-post research analytics, the study examined the association among the variables – Agricultural credits, financial inclusion, and economic growth.

It is generally acknowledged that a number of research findings stressing poverty as a direct consequence of financial exclusion are responsible for the term Financial Inclusion (FI) to limelight in the early 2000s (UNCTAD, 2021; Fouejieu et al., 2020; Kumar, 2017; CFI, 2013; NFIS, 2012; World Bank, 2008). Since then, the primary objective of financial inclusion initiatives has been to provide every adult in the community with simple, access to a range of cost-effective financial products tailored to their needs (Abbas & Atanda, 2019; NFIS, 2018; Zulkhibri & Ghazal, 2017; FAO, 2017; DFS, 2017; RBI, 2008). Pensions, insurance, credit, savings, and payments are a few of these. The official and informal sectors coexist in Nigeria's dual financial system with little to no interaction and a significant amount of money traveling outside the banking system.

It was projected that there was N12.67 trillion outside the banking sector as of December 2011. According to recent studies, 39.2 million adult Nigerians (or 46.3% of the 84.7 million adult

population in the nation) were not able to obtain formal or informal finance in 2012 due to financial exclusion. Analysis conducted later showed that 34.0% of the excluded population had no formal education, 80.4% lived in rural areas, 73.8% was under the reproductive age of 45, and 54.4% of the excluded population was female. Out of its population of roughly 168 million, including 89.7 million adults, Nigeria has 28.6 million bank accounts (EFINA, 2012).

Sanusi (2010) asserts that if financial services were available to all segments of society, economic growth would happen faster. Nigeria and other emerging countries governments place a high premium on financial inclusion. Examples of these include the new funding vehicles, improved regulations, and revised FI policy plan announced by the Federal Government in 2011 (NFIS, 2012). By 2020, the Nigerian government hopes to have achieved universal inclusion. The goal of Nigeria's Apex bank has been to maintain foreign reserves in order to protect the value of the Naira on the global market. It is believed that the financial inclusion plan is essential to reaching this goal. This goal and others are thought to be achievable since financial inclusion encourages SMEs businesses to have access to financing, which improves non-oil exports, increases productivity, and stabilises the demand for the naira. Agriculture has, historically provided majority of people in rural areas with their main source of employment, a significant portion of the country's GDP, non-oil earnings, and foreign exchange profits. As a result, the government began enacting regulations pertaining to financial inclusion and recognised the agricultural industry as a top industry to drive progress. Early in the 1970s and late in the 1960s were the times of these projects. Among these, the establishment of the Bank of Agriculture in 1972 is notable, albeit not the only one. The Bank was founded to help make sure that financial services are available and affordable for all parties involved in the agricultural value chains, especially small scale family farm holdings. It was hoped that this initiative would help entrepreneurs take

advantage of the many opportunities and potentials that the agriculture industry provided. 47 years have passed since the Bank was founded, which is more than enough time for us to consider and evaluate our accomplishments.

The significance of financial inclusion and agricultural funding for Nigeria's economic growth cannot be overstated. Agriculture has always been at the heart of Nigeria's economy, providing livelihoods for millions and contributing significantly to the country's GDP. The Research is designed to take advantage of secondary data, sourced from online, and publications. The World Development Indicators (WDI), the Bank of Agriculture (BOA), the National Bureau of Statistics (NBS), and the Central Bank of Nigeria (CBN) were among the many sources which secondary data was compiled from. Regression analysis was then applied to the data in order to do further in-depth analyses of the research methodology. Nonetheless, evaluations of descriptive statistics were carried out on the data before the regression utilising pre- and post-estimation. Descriptive analytics was used to provide a summary of the data collected. A specific data collection, which may be a sample of the population or a representation of the complete population, is summarised using descriptive statistics, which are typically precise informative coefficients (Hayes, 2023). The statistics distinguish between measurements of variability (spread) and measures of central tendency. It highlights the most important components of a set of data or the quantitative description as a whole. It might be difficult to analyse data that is provided in raw form, particularly if there is a large amount of data or information to process. Descriptive statistics are necessary because of this. Descriptive statistics are therefore better for understanding the data since they present the facts in a more comprehensible manner and give a detailed explanation of the essential features of the data used in the study. They also provide brief explanations of the measurements and the sample. Descriptive statistics are the foundation of almost all quantitative

analyses of data, together with fundamental graphical analysis (Hayes, 2023; Bakshi, 2021). Cooksey (2020) describes descriptive statistics as a statistical analysis that aids in the description, display, or summarisation of data in an understandable manner so that, for instance, patterns may emerge from the data. He claims that the use of descriptive statistics prevents us from deriving any meaning from the facts we have examined or from assigning any weight to future ideas. They are only meant to serve as an interpretation of our data.

Descriptive statistics help in presenting the research data in a more understandable manner thanks to descriptive statistics, it is simpler to interpret the data. Descriptive statistics enable us to accomplish this. One important issue covered in previous Laerd Statistics tutorials is how to properly portray data using statistics and visualisations. When describing data, two main statistical categories are usually used. As a pre-estimation test, unit root tests are crucial for identifying the integrational characteristics of data series in time-series analysis. Over the past 40 years, applied econometrics has paid much attention to the significance of unit root tests and their advancement (Xiao, 2013). Before analysing any trending information, he suggested that the data be first differenced or regressed on predictable functions of time to make the data stable. Unit root tests can be used to do this. He also mentioned the possibility of links between nonstationary time series variables and long-run equilibrium in financial and economic theory. Johansen (2015) states that if the variables are $I(1)$, co-integration techniques can be used to characterise long-run linkages. This is a crucial topic because policymakers and econometric model developers need to know if unit roots exist in time-series data. The Autoregressive Distributed lag (ARDL) model which accounts for long-run co-integration, is employed to estimate both the short-run ARDL relationship and long-run coefficients. This is achieved through the Bound Test, methodology developed by Pesaran et al. (2001) developed the Boundaries Test (PSS) as part of the ARDL co-

integration testing approach. This test, which is an extra F-test on the lagged levels of the independent variable(s) in the ARDL equation, is used to quantify cointegration. Additionally, the ARDL model has the most applicability among dynamic unconstrained models in the econometrics literature. The dependent variable in this model is made up of the lag, current, and own lag values of the independent variables. An effective statistical method for forecasting level connections in situations where the time series' underlying feature is totally I (0), entirely I (1), or jointly cointegrated is the Autoregressive Distributed Lag Model (ARDL) Bounds testing strategy. As an extension of ARDL modeling, bound testing evaluates the significance of the lagged levels of the variables in a univariate equilibrium correction system using F and t statistics when it is unclear whether the process generating the data that underlies a time series is first difference stationary or a trend. In this instance, the interaction between the short- and long-term variables are examined using the ARDL model. On the other hand, a link between two variables over time can be examined using the Granger causality approach. Although they are connected, the phrases "causality" and "cause and effect" are not synonymous. The Granger causality technique is a statistical approach that relies on the concept of prediction X Causes Y, then prior values of X should include information that aids in predicting Y. Put another way, if X is impacted by both Y's lag values and X itself, then Y Granger causes X. Similarly, if Y's fluctuation is determined by both X's latency and its own lag, then X Granger has an impact on Y. A statistical technique to determine if one-time series may be used to predict another is the Granger causality test. This threshold serves the cutoff point for rejecting the hypothesis, which occurs when the probability value falls below This threshold would be used to reject the hypothesis if the probability value dropped below it. The validity tests of serial correlation or the empirical results were validated in this work using

additional diagnostic tests, including the heteroscedasticity test, Ramsey reset test, normality test, and stability test of CUSUM and CUSUMQ.

Trustworthiness, Reliability, and Validity of Data

The degree of certainty associated with this kind of quantitative research is assessed using the measures and instruments utilised in the study, as well as the degree to which the threat to internal validity is managed (Bhandari, 2022). If study findings are perceived as trustworthy, people will accept them, use them to shape public policy, inform personal decisions, and motivate collective action. The conventional justification for why the general public should believe experts when they say they are acts as the basis for the paradigm. Bhandari (2022) states that this paradigm is the study methodology that most successfully takes into consideration confounding variables, subjective biases, and other forms of "noise" that could compromise the objectivity of the study. However, if we take social, ethical, or political trustworthiness seriously, this control is designed to lessen or eliminate the impact of the majority of the things that are important to us. The paradigm is apparent in the focus on the ability of the researcher to remove both the study subject and oneself from their natural environments. Through extraction, purification, sterilisation, and other processes, the former is isolated from confounding variables (Streefkerk, 2022). He says the latter is veiled behind impersonal jargon in study papers and is white-coated, rubber-gloved, and free of conflicts of interest. The perception of these detachment requirements, often known as "standard norms," as unquestionable evidence of objectivity raises problems for human subjects research generally and community-based research in particular. Community-based research actually defies the norms blatantly, instead of accepting them and making every effort to follow them to the letter. Instead of striving to retreat to disinterested isolation, the ethos of community-based research

pushes academics to advance toward responsible connection (Jordan, Gust, & Scheman, 2011). They argued that researchers need to make a commitment to listening to and learning from a range of people and groups that have an interest in the research's findings in order to be objective, which is typically perceived as trustworthy. This is much more demanding than just keeping an impartial stance. We contend that community-based research is a more successful approach to achieving objectivity than research that aims to imitate the existing standards if we take trustworthiness as a fundamental component of the concept of objectivity. We do not back down from this unorthodox critique of the status quo. In this study, the data were evaluated using statistical testing tools. Internal validity is preserved when there are no additional confounding variables and the change in the response parameter is solely attributable to the explanatory indicator (Kaya, 2015). The following possible internal validity hazards should be taken into account while doing quantitative research: measurement, statistical regression, pretest, and measurement. Additionally, methods of external validity were used to evaluate reliability. Conversely, credibility is the quantitative research counterpart of internal validity; it centers on the truth-value conundrum. Credibility-assuring techniques include triangulation, ongoing observation, sustained engagement, and member checks (Korstjens & Moser, 2018). Selecting a plan is crucial while creating a study as not every technique is suitable in every situation. Low literacy study participants, for instance, could not be able to perform a member check of written findings. To optimise internal validity, researchers need to make sure that their research design is comprehensive and that there is sufficient quality control and execution in place. These processes should include appropriate recruitment strategies, data collecting, analysis, and sample size, among other things (Garg, 2016).

Broad inclusion criteria that produce a research population more like the real world can improve external validity (Patino & Ferreira, 2018). They emphasised that it is difficult for them

to draw any conclusions about how the results relate to reality because studies lack internal validity. External validity is therefore useless if a trial's results lack internal validity. In this case, results from a relatively small study sample were extrapolated to a larger population in order to evaluate the study's robustness using external validity. The capacity of study findings to be generalised and applied to a wider environment is known as external validity, according to Patino and Ferreira (2018). This is significant because the primary objective of the study is to adapt its conclusions to actual circumstances. The real world is the ideal setting for researchers to generalise their findings. One of the primary objectives of researchers searching for reliable cause-and-effect linkages in qualitative investigations is external validity. Actually, the term "external validity" simply refers to the generalisability of a study's conclusions to a range of populations, circumstances, or settings. Nevertheless, there are instances in which they place more weight on identifying the causes of the differences between variables than on the applicability of the results. Clearly defining your study topic and objectives is the first step towards ensuring the validity and reliability of your quantitative findings. Why, what, and who are you trying to learn? The goals of the study must to be precise, quantifiable, achievable, relevant, and time-bound. They must also preserve the moral principles and values of social work, such as human dignity, social fairness, and respect for others.

The scales used in the study had to be authentic and trustworthy in order for the findings to be useful. It is essential to comprehend how scientific research assesses the validity and reliability of the scales. Despite their close relationship, the phrases validity and dependability refer to distinct aspects of measurement equipment. In general, gauges are trustworthy even when they are untrue; however, this is not always the case. Validity measures a tool's ability to capture the characteristics and behaviour of an assessment instrument (Karp & Brockington, 2015;

Anastasi & Urbina, 1997). It serves as a barometer for how well a measurement instrument accomplishes its intended task. They asserted that the way the measuring device interprets the data it receives as a result of its analysis determines the validity of the measurement. What Whiston (2012) describes validity as collecting appropriate data for the intended purpose of the measuring apparatus. On the other hand, effectiveness focuses on gathering data relevant to the intended application of the measuring equipment. These validity tests are meant to determine whether the scale's features qualify it for usage in research (Oliver, 2010). Validating the effectiveness is more important than finding the reliability, even though it is more difficult. For research to be useful, the instrument must measure what it claims to measure. Using validated measurement methods ensures the validity of the conclusions drawn from your study (Pett et al., 2003).

Unlike qualitative research, quantitative research uses dependability by evaluating the internal consistency, or consistency, of the measurements or measuring instruments used in the investigation. Researchers have assessed dependability using the test-retest method, sometimes referred to as stability, which involves measuring a group of people, waiting a predefined period of time, and then delivering the same equipment to the same group again. Equivalency is a metric that can be used to compare the results of two doses of the same test on a group of subjects (Pett et al., 2003). Equivalency studies and stability estimations are two further techniques for examining reliability. This is achieved by administering one type of remedy to the same group of people initially, and then another form of remedy after a certain amount of time. Reliability is essential to quantitative researchers because it provides a basis for validity and indicates if a study will produce consistent results over an extended period of time. Since reliability gauges the caliber of the investigation, it is important. If a research study's conclusions are true or factual, they are usually trustworthy. Determining the accuracy of a study is an important component of validating

it. It describes the degree to which the study truly catches the facts that it was intended to validate (Blumberg et al., 2005).

According to Robson (2011) reliability denotes the data's precision and consistency across a range of contexts and sources, whereas validity relates to how well the data measures what it is intended to assess. The only relevant information and support for social work approaches that may be obtained are from trustworthy quantitative data. The purpose of his work was to guide researchers through the utilisation of standard practices and instruments to guarantee the accuracy and dependability of their quantitative data when using it in socially (Robson, 2011). A measuring device is typically accurate even if it is not legitimate, but if it is, it is also probably accurate. However, dependability does not always imply validity (Patino & Ferreira, 2018). For all its reliability, a test may not accurately reflect the desired behavior or quality. Therefore, it is imperative that the researchers evaluate the accuracy and reliability of the measurement tool. The measurement tool needs to satisfy these two conditions. Otherwise, the researchers would not benefit from an analysis of the research findings. According to Zohrabi (2013), the core idea of qualitative research is that validity has multiple characteristics, including dependability, utility, and reliability. The validity of a study is determined by how well the protocols for using scientific research procedures were followed when drawing conclusions. All forms of education require it (Oliver, 2010).

According to Hox and Boeijs (2005), while using secondary data, researchers have to locate this information through administrative files, official statistics archives, or other records maintained by these public or private sector organisations. The information required for this inquiry consist of the Reall Gross Domestic Product (RGDP) data for Nigeria show economic

growth; the amount of agricultural loans and advances hereafter referred to as "Agricultural Credit" and denoted by the acronym (AGRCDT) which banks have given to the private sector; and Financial inclusion which is measured by three factors, namely, the quantity of deposits that banks accept (CBB), the number of borrowers that banks record in their books (CBD), and the number of bank branches (CBB) throughout the country.

All banks maintain regular records of these numbers, which they are mandated by law to provide to the Central Bank of Nigeria (CBN); failure to do so could result in penalties for financial institutions that do not comply with the law. By definition, the CBN, World Bank, and Nigerian Bureau of Statistics regularly gather, verify, and retain these as primary data. However, these and a plethora of other data warehoused by the World Bank, the CBN, and similar agencies serve as secondary data for everyone using them.

This research utilised Longitudinal data to investigate its hypothesis based on after-the-fact research methodology. Reputable financial firms having a history of gathering and maintaining precise data on the delivery of banking services, are the source of the secondary data. These data are reliable by nature and suitable for well-informed assessments and decision-making since they are always validated before being made accessible for public consumption and usage. They have high integrity since the procedure for obtaining access to this kind of data keeps the investigator from having direct control over the information's value (Velicer & Fava, 2003; Kerlinger 1973). According to established conventions and practices, the resources are by their very nature authentic and reliable.

Research Findings

Descriptive statistics

The descriptive data is shown in the table below. The values for the overall mean, standard deviation, minimum and maximum, skewness, kurtosis, and Jarque-Bera probability for each variable used in the analysis as shown in Table 8.

Table 8: Descriptive Statistics Summary

	LRGDP	LAGRCDT	LDCB	LCBB	LBCB
Mean	2.253922	8.785788	2.483186	0.711710	1.461817
Median	0.818960	9.051531	2.702717	0.709874	1.481769
Maximum	11.65139	10.58613	3.163879	0.816951	1.550404
Minimum	-0.093726	5.630275	0.000000	0.577362	1.337990
Std. Dev.	3.940102	1.114721	0.743563	0.067320	0.056036
Skewness	2.014529	-0.855322	-2.118149	-0.054442	0.773277
Kurtosis	5.111021	4.241346	7.287808	2.178764	2.733550
Jarque-Bera	18.10350	3.908835 3	1.79007	0.600499	2.154971
Probability	0.000117	0.141647	0.000000	0.740633	0.340450
Sum	47.33236	184.5016	52.14692	14.94592	30.69816
Sum Sq. Dev.	310.4881	24.85206	11.05771	0.090641	0.062801
Observation	21	21	21	21	21

Source: The Researcher's statistical computation (2023) performed with E-Views 10

Table 8 contains the summary of all the variables employed in this research. The results demonstrate that with the exception of Real GDP, the standard deviations of the variables are comparable to their respective means. The gross domestic product varied from 0.09% to 11.6% at its highest point, with an average of 2.25%. With the highest rate at 10.58% and the lowest at 5.63%, the average rate for agricultural finance was 8.78%. With the highest deposit at 3.16% and the lowest deposit at 0.00%, the average deposit at a commercial bank was 2.48%. With 0.81 being the highest percentage and 0.57 being the lowest, the average percentage of commercial bank branches was 0.71. The greatest percentage of borrowers from commercial banks was 1.55%, with an average of 1.46% coming from these institutions. 1.33% was the lowest percentage. Generally speaking, the data are seen to be scattered.

We also conducted an estimation of the Jarque-Bera test for normalcy. We were guided by the dictum which holds that we do not reject the null hypothesis if Jarque-Bera statistical probability is greater than 0.05. The null hypothesis states that the data distribution of the series is normal, while the alternate hypothesis says it is not normal. The outcome of our study revealed that with the exception of the GDP and commercial bank deposits, which have probabilities less than 5%, all of the variables in Table 8 which are based on joint normality tests have probabilities greater than 5%, suggesting that the null hypothesis is accepted for the density of bank branches, bank borrowers, and agricultural credit.

Unit Root Test

Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) Approaches

The unit Augmented Dickey-Fuller (ADF), and Phillips-Perron (PP) unit root tests were employed to ascertain the order of integration of the variables under investigation.

Table 9: Unit Root Test

ADF @ 5%					
Variable	Level	Prob.	1st diff.	Prob.	Order of integration
LRGDP	-4.719159	(0.0017)	-4.026670	(0.0088)	I(0)
LAGRCDT	-3.576789	(0.0163)	-6.381886	(0.0001)	I(0)
LBCB	-1.513804	(0.5062)	-3.505304	(0.0195)	I(1)
LCBB	-1.885843	(0.3316)	-3.742049	(0.0120)	I(1)
LDCB	-12.81739	(0.0000)	-7.650890	(0.0000)	I(0)
PP @ 5%					
LRGDP	-4.946244	(0.0527)	-4.190765	(0.0047)	I(0)
LAGRCDT	-3.556953	(0.0170)	-6.208127	(0.0001)	I(0)
LBCB	-1.719898	(0.4067)	-3.486568	(0.0203)	I(1)
LCBB	-1.885843	(0.3316)	-3.742049	(0.0120)	I(1)
LDCB	-9.511057	(0.0000)	-24.94797	(0.0000)	I(0)

Source: The Researcher's Computation (2023) using E-Views 10

Following the integration of the variables in the order shown in Table 9, the Phillips Perron and Augmented Dickey-Fuller (ADF) tests were conducted. For ADF and PP. The null hypothesis was $H_0 = \beta = 0$. The null hypothesis posits that the coefficient (β) has a unit root, implying non-stationarity ($\beta = 0$), whereas the alternative hypothesis (H_1) suggests that the coefficient is stationary and negative ($\beta < 0$). The results for the level and differenced variables are shown in Table 9.

To find the existence of unit roots and the sequence of integration in all the variables, the stationary tests were first performed in levels and then in the first difference. These variables are non-stationary in levels if the ADF and Phillips Perron tests indicated inconclusive evidence regarding the presence of a unit root in some level data series. However, upon differencing the results at 5% significance level, revealed that the variables are stationary integrated of order one, $I(1)$, suggesting that the first differencing successfully induced stationarity. In contrast, the variables LBCB and LCBB. However, the LGDP, LAGRCDT, and LDCB series have zero order $I(0)$ integration. Consequently, using the method that was previously mentioned.

Correlation Coefficient Matrix

Using the Pearson correlation coefficient matrix, the degree of linear relationship between the model's included variables was ascertained. It is used to calculate the linear relationship's strength and direction. For this statistical analysis, the terms "correlation" and "correlation coefficient" are commonly used.

Table 10: Correlation Matrix

	LRGDP	LAGRCDT	LBCB	LCBB	LDCB
LRGDP	1.000000				
LAGRCDT	-0.651219	1.000000			
LBCB	0.347173	-0.096529	1.000000		
LCBB	-0.557353	0.535867	-0.311683	1.000000	
LDCB	0.174330	0.177589	-0.101784	0.340951	1.000000

Source: The Researcher's Computation (2023) using E-Views 10

Table 10 shows the pairwise correlation coefficient between the variables that were being studied. A moderately unfavorable association between agricultural credits and real gross domestic product is indicated by a correlation of -0.65. There is a slight but positive correlation (0.34) between the volume of bank borrowers and the gross domestic output. There is a moderate and negative correlation of -0.55 between the density of bank's service outlets and the gross domestic product. The correlation between deposits made with commercial banks and the real gross domestic product is positive, as indicated by the value of 0.17. The real GDP suggests 1.000, suggesting a connection that is exactly symmetrical to itself.

ARDL Estimation: A cointegration Framework

ARDL is a methodological Approach to analyzing Time series relationships. The model is the estimating framework used in this paper. For the purpose of enumerating the impact of lagged values of estimated regressors, the ARDL limits testing approach is derived from the Wald Chi square statistics or F-score in an unconstrained and conditional dynamic error correction framework (Pesaran et al., 1999). The ARDL framework is highly helpful in determining the short- and long-term effects of several independent factors on the dependent variable, according to Pesaran et al. (2001). Because there are long-term relationships between the regressors, the ARDL limits testing paradigm is very adaptable for evaluating the transitory and far-term impacts of the

explanatory factors on the responsive variables. This part presents the findings from unit root tests that were carried out during the investigation and that recommend using the ARDL model in light of the model's outcomes as stated in Chapter 3 of the study. The appropriate model (number of delays) is automatically selected using the so-called more frugal Akaike Information Criterion (AIC). Below are the near-term and far-term consequences of the model along with a long-run bound test.

Cointegration Bounds Test: A Long Run Perspective

The purpose of achieving this test is to validate long-term connectivity of the model's input variables. Table 11 reports the asymptotic bound values for the null hypothesis of a unit root, $1(1)$, and the alternative hypothesis of stationarity, $1(0)$. The one-tail F statistics results and the important bound values (for the lower and upper bounds, respectively) are shown in Table 11 below.

Table 11: Bounds Test for Cointegration

F-Statistic	Lower bound	Upper bound	K (n-1)	Sign. Level	Remarks
	2.45	3.52	4	10%	Cointegration
10.89777	2.86	4.01		5%	
	3.74	5.09		1%	

Source: The Researcher's Computation (2023) performed with E-Views version 10 software

Table 11 Results of the Bound test, estimating the F-statistic at 10.89777, indicating that the outcome is greater than the t-statistic's lower and upper bounds at the 5% level of significance (Pesaran, Shin, and Smith, 2001). The null hypothesis is rejected because of its substantial support for the alternative hypothesis, which posits the existence of a cointegration relationship among the variables within the model. This, in turn, implies that the null hypothesis of no cointegration among the relevant variables is not upheld. Consequently, our findings suggest that a long-term, cointegrating relationship exists among all the variables under investigation in this study. The

ARDL Co-integration approach was chosen for this evaluation because of its ability to be precise in estimating the short- and long-term connections among the variables.

Long-Term Error Correction Mechanism Results

The bounds test results presented earlier indicate the presence of a long-run relationship among the variables in the ARDL model. Consequently, the next step involves estimating the model's cointegration and long-run coefficients. This will enable us to investigate the existence and nature of the long-term relationships between agricultural loans, financial inclusion, and economic growth in Nigeria. The results of this analysis are reported in Table 12

Table 12: ARDL Co-integration Analysis, and LongTerm Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-2.37E+11	3.23E+11	0.000000	0.0000
LRGDP	0.081194*	0.228255	0.355714	0.7325
DCB	-72832571**	62789566	0.000000	0.0000
BCB	6.39E+09**	8.54E+09	0.000000	0.0000
LAGRCDT	11.71174***	3.595270	3.257541	0.0139
CBB	1.30E+10**	1.64E+10	0.000000	0.0000
CointEq(-1)	-0.081194**	0.008774	9.253396	0.0000

Source: The Researcher's Computation (2023) performed with E-Views version 10 software

Note: ***, **, * denotes significant at 1%, 5% and 10% respectively

Table 12 shows the long-term correlations between the variables. According to the 0.081 coefficient of LRGDP lag one on RGDP, an increase in real gross domestic product lag one will, on average; improve LRGDP by 8.1% over the far term while holding all other parameters constant. As a result, the relationship between the RGDP this year and the RGDP lag one is both positive and statistically insignificant.

Regarding the first objective, to investigate the effect of inclusive finance on Fiscal expansion of the Nigerian economy, Table 12 reveals that the coefficient of deposit with

commercial bank is negative with value of -728, the impact of commercial bank deposits and real gross domestic product is negative. This implies that, over the long run, an increase in commercial bank deposits will cause a 7.2% decline in real gross domestic product, presuming all other factors stay the same. Consequently, there is a negative and statistical significant impact of DCB in relation to LR GDP. Similarly, there is a statistically significant positive correlation between borrowers with commercial banks and real gross domestic product, as indicated by the positive sign of the coefficient of borrowers with commercial banks, which stands at 6.39. If all other factors remain same, it can be deduced that an increase in commercial bank borrowers will ultimately lead to an average 6.3% rise in the gross national income. Moreover, the research found a positive figure in density of bank branches to GDP. The positive coefficient of $1.30E+10$ suggests that a unit increase in the CBB will eventually translate into a 1.30% increase in the LR GDP. The findings of this analysis are consistent with those of Adedokun & Aga (2020); Duc & Anh (2019), and Seth & Acharya (2018), who also showed that financial inclusion significantly boosts Nigeria's Fiscal growth.

In examining the effect of agricultural credit on the growth of Nigeria's economy with a unique focus on the Bank of Agriculture regarding the second objective. The result from Table 12 posits that agricultural credits have a long-run influence on the growth of Nigeria's economy. The coefficient of agricultural credit is 11.71 which indicates a positive and statistically significant impact of agricultural credit on real gross domestic product. Accordingly, an increase in LAGRCRDT will eventually result in an average increase in real gross domestic output by 11.7%. This finding is consistent with the study conducted by Okunola et al, (2019) which found a positive statistical effect of agricultural credits on real GDP in Nigeria.

Findings of this research, based on third objective which examined the far-term connection between access to and use of financial resources, agricultural credit and economic expansion in Nigeria, is contained on Table 12. Detail of the results revealed that there is a long-run association between the variables, agricultural credit and economic growth in Nigeria. The positive coefficient estimated at 11.71 is significant, and indicates a long-run association between increased agricultural credit delivery and expansion of the Nigerian economy. The study has also found a positive and statistically significant connection between financial inclusion and economic growth. The same outcome is reported concerning the interaction between the density of bank branches and the growing participation of borrowings in banks. This implies that financial inclusion and agricultural credits are long-run drivers of economic growth in Nigeria. In this connection, the study has shown that the error correction term (ECT) complies with statistical and theoretical requirements regarding sign and size. It gauges how quickly the initial deviation is corrected and the situation returns to equilibrium. The long-run equilibrium in the current year has reestablished 8.1% of the disequilibrium caused by the shock in the previous year, as indicated by the ECT coefficient, which is -0.081 and significant at 5%.

Short Run ARDL Relationship

The short-run ARDL test settings are shown in Table 13. AIC recommends a model with 1, 1, 2, 1, 2.

Table 13: Short Run Result ARDL (1, 1, 2, 1, 2)

Variables	Coefficient	Standard error	t-statistic	p. value
Constant	-2.37E+11	03.23E+11	-0.734488	0.4865
$\Delta LR GDP(-1)$	1.081194**	0.228255	4.736783	0.0021
ΔDCB	1.20E+08*	2.16E+08	0.556125	0.5954
$\Delta DCB(-1)$	-4.26E+08***	2.20E+08	-1.937897	0.0938
$\Delta DCB(-2)$	2.33E+08*	1.59E+08	1.462229	0.1871
ΔBCB	8.55E+09***	3.82E+09	2.239315	0.0601
$\Delta BCB(-1)$	5.37E+09*	4.43E+09	1.212559	0.2646
$\Delta BCB(-2)$	-7.52E+09*	5.41E+09	-1.390231	0.2071
$\Delta LAGRCDT$	-0.959333*	1.597230	-0.600623	0.5670
$\Delta LAGRCDT(-1)$	12.67107**	2.471176	5.127546	0.0014
ΔCBB	2.92E+10*	1.76E+10	1.659743	0.1409
$\Delta CBB(-1)$	-1.63E+10*	1.73E+10	-0.938851	0.3791
R-squared	0.966014			
Adjusted R-squared	0.964037			
Durbin-Watson Stat	2.311242			

Source: The Researcher's Computation (2023) performed with E-Views version 10 software

Note: ***, **, * denotes significant at 1%, 5% and 10% respectively

The projected short-run ARDL model result for ARDL 1, 1, 2, 1, 2 is shown in Table 13. Additionally, two lags were chosen for the number of agricultural credits, two lags for the borrower base of banks (BCB), two lags for the volume of bank deposits (DCB), and one lag for the density of bank's service outlets (CBB). The real gross domestic product (RGDP), the dependent variable, was taken into consideration when selecting each of these delays. The actual gross domestic product of the previous year presents a favourable and substantial influence in the present figure. The evidence suggests that the dependent variable's value from the previous year has an effect on itself and is statistically significant at the first lag in the short-run model. The coefficient of deposit with commercial banks, which similarly demonstrates a positive and statistically insignificant influence on real gross domestic product, indicates that a one-unit increase in deposits with commercial banks will lead to an increase in economic growth in the near term. The reported

coefficient of deposit with commercial banks (-4.26) which has a one-year latency, is negatively linked with the real gross domestic product, and is statistically insignificant. The findings of Ozowuru and Ozuzu (2018), which show that deposits have a negative relationship with economic growth, is consistent with the idea that a rise in the average amount of money held in commercial banks will lead to a decline in real gross domestic product.

However, the model revealed a favourable coefficient of 2.33 and a statistically insignificant relationship with the real gross domestic product in the second year, or at lagged two. This suggests that the value of deposits placed with commercial banks in the previous year has a favorable influence on growth in the current year, which occurs two years later. Positive and statistically insignificant figures on the number of borrowers with commercial banks indicate that an increase in this number is anticipated to contribute positively to Nigeria's real gross domestic product this year. Borrowers with commercial banks at lag one provide more evidence of a short-term positive and insignificant influence on Nigeria's economic growth, however a long-term negative impact is also proposed. Additionally, the agricultural credit results for this year, with a coefficient of -0.95, are statistically insignificant and unfavorable, indicating that increases in agricultural credit in the short term will likely slow down economic growth. This suggests that the value of agricultural credits from the previous year was statistically significant at lag one and had a positive effect on Nigeria's economic growth. A short-term increase in the number of commercial bank branches will accelerate economic growth, as evidenced by the positive and statistically insignificant impact of the number of branches per 100,000 people on real gross domestic product (coefficient of 2.92).

Furthermore, the density of bank branches at the first lagged time point displays a negative coefficient of -1.63. This indicates that the opening of more commercial bank branches may

momentarily halt Nigeria's economic progress from the previous year because of the unfavourable association revealed. Additionally, Table 13 demonstrates that 96% of the changes in economic development is attributable to financial inclusion and agricultural credit, as indicated by R-squared and its adjusted value, which are incredibly high at 0.96. The Durbin-Watson statistics show that there is no autocorrelation in our data.

Granger Causality Test

When two variables are analysed for Granger causation, it is shown how one variable can provide information for the other's forecast. It evaluates whether past and present values of one variable may be used to forecast future values of another, according to Enders (2015). The null hypothesis, which claims no significant difference between zero and the set of independent variable coefficients, is considered when calculating the probability value (p-value). If the null hypothesis is rejected, then the Response variable is not Granger and is caused by the explanatory factors.

Ho: The Null Hypothesis states that there is no causality

H₁: Alternate Hypothesis states that there is causality

Table 14: Granger Causality Tests

Null hypothesis	Obs	F-statistic	Probability
LBCB do not granger cause LAGRCDT	19	2.55019	
0.1137			
LAGRCDT do not granger cause LBCB		6.19364	0.0118
LCBB do not granger cause LAGRCDT	19	0.67333	0.5258
LAGRCDT do not granger cause Cause LCBB		0.03569	0.9650
LDCB do not granger cause LAGRCDT	19	0.67470	0.5251
LAGRCDT do not granger cause Cause LDCB		0.83797	0.4532
LRGDP do not granger cause LAGRCDT	19	10.0439	0.0020
LAGRCDT do not granger cause LRGDP		1.68678	0.2206
LCBB do not granger cause LBCB	19	0.00966	0.9904
LBCB do not granger cause LCBB		0.04094	0.9600
LDCB do not granger cause LBCB	19	0.29210	0.7511
LBCB do not granger cause LDCB		1.18927	0.3334
LRGDP do not granger cause LBCB	19	2.68178	0.1033
LBCB do not granger cause LRGDP		5.42369	0.0180
LDCB do not granger cause LCBB	19	0.21482	0.8093
LCBB do not granger cause LDCB		0.03622	0.9645
LRGDP do not granger cause LCBB	19	0.28596	0.7556
LCBB do not granger cause LRGDP		1.72447	0.2140
LRGDP do not granger cause DCB	19	0.33327	0.7221
LDCB do not granger cause LRGDP		0.77310	0.4803

The decision rule states the Null Hypothesis of no causality is rejected if the $p < 0.05$, then rejects the null hypothesis, otherwise it will be accepted.

Source: The Researcher's Computation (2023) performed with E-Views version 10 software

Table 14 on the results of the Granger causality test, reveals that in Nigeria increase in agricultural credit delivery leads to more debtors with Banks. Rather than the other way around, it may be said that of Nigeria that, agricultural credits impact favourably on the debtors. This finding shows that there is a one-way causal relationship between agricultural credit recipients and commercial banks. Commercial bank branches do not result from agricultural credits, and agricultural credits do not result from commercial bank branches. Consequently, the results demonstrate a causal association between the quantity of commercial bank branches and Nigeria's agricultural loans. In Nigeria, agricultural credits do not always result in deposits with commercial banks, and vice versa for deposits with commercial banks. Additionally, the result points to a

reciprocal deterministic association between farm loans and commercial bank deposits. This demonstrates that one cannot depend on commercial bank deposits to forecast whether agricultural loans would be available in Nigeria (Table 14). Furthermore, table 14 indicates a cause-effect link between GDP and agricultural credit, but not between GDP and agricultural credit. The conclusion postulates a one-way causal relationship between GDP and agricultural finance. Furthermore, there is a relationship in both directions between the two variables because there is no direct association between the total number of clients who bank at a commercial bank and the density of branches. The results indicate that there is a two-way relationship between bank deposits, and bank borrowers and that there is no causal dependence between the two groups of people. In Nigeria, commercial bank borrowers are the reason for the growth in the country's gross domestic product rather than the other way around.

The results indicate that there is a one-way causal association between GDP and borrowers who have commercial bank accounts. Bidirectional causality exists because there is no association between the number of commercial bank branches and the amount of deposits in commercial banks. The number of commercial bank branches directly affects the gross domestic product, although it does not directly cause it. This suggests that the causal link is unidirectional. Finally, although deposits with commercial banks have an impact on the GDP, deposits with commercial banks do not. In contrast to Sharma's (2016) study, which discovered a one-way relationship between commercial bank deposits and real GDP, the results indicate a bidirectional causal relationship.

Diagnostic Test or Validity tests

The diagnostic test is used to assess the reliability and consistency of the predicted coefficients in the model. It consists of tests for autocorrelation, heteroscedasticity and normalcy, and stability.

Serial Correlation Diagnostic: Langrage Multiplier (LM) Test

To check for serial correlation and autocorrelation among the residuals, the Breusch-Godfrey LM Test was conducted, and the findings are reported in Table 15.

Table 15: Assessing Serial Correlation: - Langrage Multiplier (LM Test)

F-statistic	1.149331	Prob. F (2,5)	0.6830
Obs*R-squared	2.687797	Prob. Chi-Square (2)	0.2608

Source: The Researcher's Computation (2023) performed with E-Views version 10 software

The serial correlation test is based on the null hypothesis that the residuals are randomly distributed and do not exhibit serial correlation being rejected since the probability value associated with the Langrange multiplier (LM) is more than 5% at all delays (Table 15). The findings suggest that the null hypothesis of no serial connection, is accepted at a 5% significance level.

Hetroscedasticity Test

A heteroscedasticity test was run to determine whether the estimated model's residuals were homoscedastic or heteroscedastic. Table 16 presents the findings.

Table 16: Heteroscedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.149331	Prob. F (11,7)	0.4422
Obs*R-squared	12.22902	Prob. Chi-Square (11)	0.3467
Scaled explained SS	2.188660	Prob. Chi-Square (11)	0.9977

Source: The Researcher's Computation (2023) performed with E-Views version 10 software

The homoscedasticity null hypothesis was accepted, as shown in Table 16, because the chi-square probability value is more than 5%. This proves that there are no heteroscedasticity issues with the model. The model is homoscedastic because the probability values of the three parameters are greater than the 0.05 significance level. Table 16 displays the Ramsey reset test result.

Table 17: Ramsey Test

Equation: UNTITLED			
Specification: LRGDP LRGDP (-1) LRGDP (-2) DCB DCB(-1) DCB(-2) BCB LAGRCDT			
LAGRCDT(-1) CBB C			
Omitted Variables: Squares of fitted values			
	Value	Df	Probability
t-statistic			
	0.89283	45	0.4129
F- statistic	0.797152	(1,5)	0.4129

Source: The Researcher's Computation (2023) performed with E-Views version 10 software

Table 17 shows that the total significance of the coefficients for all predicted powers is zero and that the Ramsey tests for the regression are correctly represented. The coefficients of all powers that the Ramsey test predicts are sufficiently expressed and not significantly different from one another. The result shows that the study model is stable and has been expressed appropriately (Table 17). The model also passed all post-estimation tests, mostly because their probability values were more than 5%. These tests included the heteroscedasticity, Normality, Ramsey, and serial correlation.

Normality Test

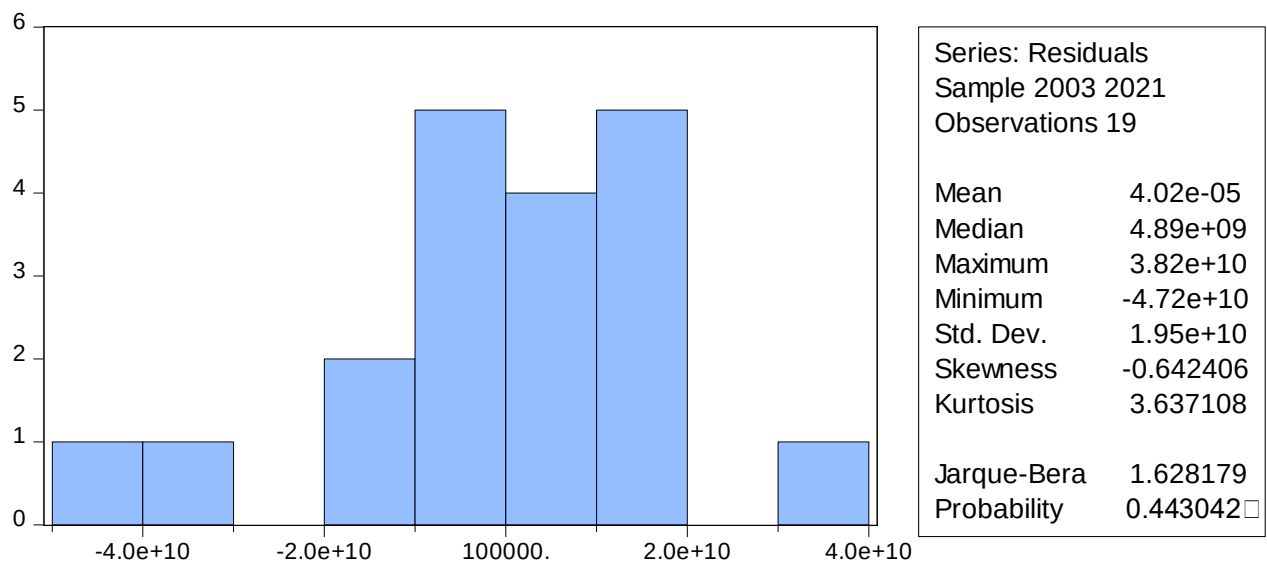
The Jarque-Bera normality test was performed to assess whether if unexplained variations or Estimation errors (residuals) of the estimated model follow a normal distribution.

H_0 : The residuals are distributed normally.

H_1 : There is an abnormal distribution of the residuals.

Figure 2

Normality Test



Note: Researcher's Computation (2023) performed with E-Views version 10 software

As seen in Figure 2, the estimated result's Probability value (simply called p-value) for the Jarque-Bera statistic is more than 5%, indicating that the residuals are normally distributed, which is in line with the null hypothesis. Consequently, we support the null hypothesis, which states that the residuals (unexplained variations, also called estimation errors), have a normal distribution.

Stability Test

A model stability test was performed, as shown in Figure 2, to ensure that the data production process was compatible with the calculated model coefficients. Figure 2 also shows graphs of the residuals inside the plus/minus range surrounding the zero line. The test determines that a residual outside of the typical error bars indicates parameter instability in the equation.

CUSUM and CUSUMQ Plot Recursive Residuals of ARDL mode

To assess the stability of the short-run coefficient, we employed the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) tests on recursive residuals, following the approach suggested by Brown et al. (1975). Because neither the cumulative of squares nor the cumulative sum graph's line crossed the 5% significance level, the graph's result demonstrates that the null hypothesis is accepted. This shows model stability at the 5% significance level (see, for example, Figures 3 and 4).

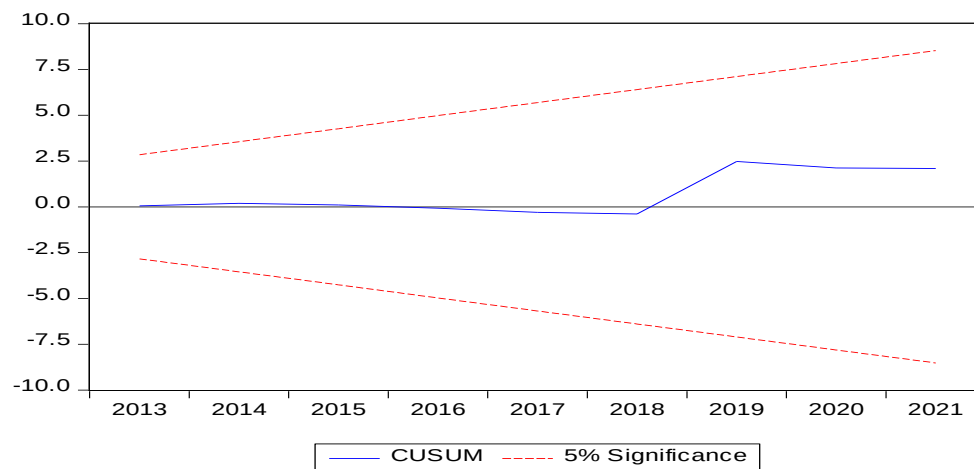


Figure 3: CUSUM Test for Recursive Residuals of ARDL model

Source: Researcher's Computation (2023) performed with E-Views version 10 software

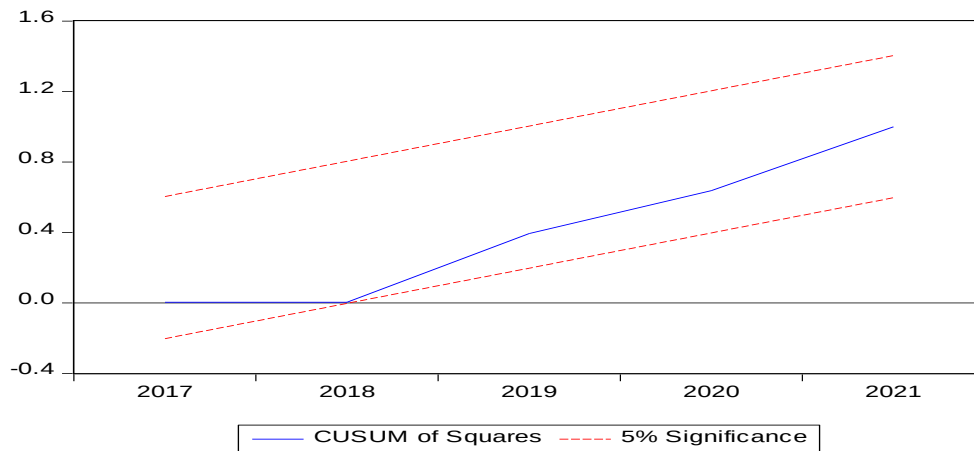


Figure 4: CUSUMQ Test for Recursive Residuals of ARDL model

Source: Researcher's Computation (2023) performed with E-Views version 10 software

Evaluation of Findings

Factual results are necessary for research to be regarded as reliable, valid, and trustworthy, according to Blumberg et al. (2005). Because of this, any attempt to carry out such a study also needs to gather measurable, reliable, and verifiable data. To obtain the same results, this data should be thoroughly reviewed using techniques that may be replicated (Zohrabi, 2013; Robson, 2011). Because of this, researchers can only be considered genuine and dependable if they employ accurate data from reliable sources, according to academics.

This study's quasi-experimental (Ex-post factor design) approach and the time series data from WDI, CBN, NBS, and BOA were chosen based on the previously mentioned considerations. More specifically, it is believed to be preferable to experimental research since it can assess a cause based on an effect and is suitable for standardisation (Mitchel, 2015; Salkind, 2010; Porte, 2010). Together with the choice of relevant analytical procedures (such as the Unit root tests, ARDL, ECM, etc., to carry out this study), this gave the research the ability to produce reliable results. The previously described elements have enabled us to react to the subsequent circumstances: We

need to make sure that the following requirements are satisfied to get accurate and legitimate findings:

The data-derived information can be arranged and examined to identify patterns, sets, and phrases.

The data is utilised to evaluate the consequences, identify needs, and direct decision-making.

To the best of our knowledge, the statistics that support this data are accurate.

Data collection and examination is the first step in the evaluation process. The stakeholders must reach a consensus to finish data interpretation and result reporting (Peersman, 2014). To evaluate the project holistically and reach a judgment in light of the previously listed criteria, data interpretation is required. After then, the value assessment process continues by looking at the things that help or hinder development as the data is interpreted. The ideas of theory failure or implementation failure should be used to determine the important participants.

However, the study used a mixed methods approach, combining hypothetical and data-driven analysis to analyse the effects of agricultural loans on inclusive finance and economic growth through the Bank of Agriculture, Nigeria. Among the variables examined in the study were real gross domestic product, agricultural credits, bank deposits, bank borrowers, and bank branches. The two most generally recognised theories on financial inclusion that were looked at in this study were the finance growth theory and the asymmetric information theory.

The finance growth theory was used in this study primarily because recent studies have been able to provide new insights into the long-running discussion in scholarly articles about the specifics of the association between growth and finance (Pagano, 1993; Smith, 1991; Lucas, 1988;

Solow, 1956; Robinson, 1952). The controversy persists since a great deal of further research has been done worldwide so far without a conclusion. On the contrary, every one of the groundbreaking studies in this area (De Gregorio & Guidotti, 1995) demonstrates a robust connection between banking sector growth and GDP growth. As a result, governments may be able to create rational policies that would encourage economic growth if they have a thorough grasp of the connection. Patrick (1966) asserted that there might be a deterministic association between monetary progress and fiscal expansion, or vice versa. Early growth of most economies, is most apparently dominated by financial development, and as the economy grows older, demand-following begins to take center stage. A direct connection between Banking sector growth and Fiscal expansion. According to Graff (1999), and Demetriades & Hussein (1996); rather, growth merely fosters and stimulates the emergence of the banking industry. These results contradict the previously proposed linear finance-growth relationship.

Economic progress and financial development are sometimes explained by four paradoxical but experimentally validated ideas. Nyasha and Odhiambo (2015) assert that the fourth stance maintains that Banking sector growth and Fiscal growth are not causally related. This perspective is called the bidirectional causality view. Literature is replete with other paradigms, among which the supply-leading and demand-following hypotheses. While the supply-leading schools, represented by Bayar et al., 2014, say the development of the financial sector is a requirement for economic growth, the demand-following hypothesis, championed by the likes of Onwumere et al., 2012, states that financial commodities are in high demand due to the expansion of the economy. Unlike the bi-directional causation view, which argues that there is a causal relationship in both directions, the fourth perspective says there is no relationship at all between financial success and economic growth.

Up to this moment, debate on this matter rages on without a clear position on it.

However, the study's theoretical framework, the finance-growth theory, was selected due to its adaptability and significance to the ever-evolving global economic landscape. The hypothesis acknowledges that a major factor in both the existence of economic inequality and the rate of advancement is the inability to secure funding. The idea that having access to a simple, safe, and inexpensive source of finance is essential to accelerating economic growth and reducing poverty and income inequality both of which limit opportunities is gaining traction. As a result, individuals who are economically and socially disenfranchised can better integrate into society, take an active role in development, and protect themselves against shocks to the economy (Serrao et al., 2012). Nonetheless, the asymmetric information theory validates Stiglitz and Grossman's (1980) account of market "failures". It explains why it is unable to give every market participant accurate information on sellers, products, and terms of transactions. This has to do with how the information economy is becoming recognised as a completely new economic structure and how powerful it is becoming economically. Levchenko and Ostapenko (2016) assert that the modern economy is made up of the conventional production factors land, labor, capital, and entrepreneurial skills as well as information resources.

Comprehending asymmetric information is crucial for understanding the structure and operation of economic systems in general and price discovery in particular. Asymmetric information drives financial markets and affects information flow and economic dynamics. Stiglitz (2000, 2003, 2004). The information asymmetry that exists in the non-bank financial services subsector explains the defects and inefficiencies in the market.

Market failures can and will result from gaps in information between buyers and sellers, according to the hypothesis. In these situations, supply and demand dynamics, which jointly

determine the value of commodities, are said by economists to inefficiently distribute products and services in a free market. Information asymmetry may allow low- and high-quality products to command the same price due to the buyer's ignorance (Spence, 1973; Akerlof, 1970; Arrow, 1963). This skews pricing of goods and services in favour of sellers.

The hypothesis states that incomplete information about lenders and potential borrowers affects financial cycles. It demonstrates how individuals who work in the financial sector frequently do not have the desired level of client comprehension. Before you give someone money, you should get some background information about them. This will allow you to monitor their spending, ensure they have the resources to repay the loan, and prevent them from defaulting on their debt. Because of this, not everyone who requires financial services may be able to get them from banks. To put it another way, even if they have the money, they might decide not to lend it to borrowers they do not know enough about, especially if getting the necessary information will be expensive. As a result, credit is limited even in the absence of government action (Stiglitz & Weiss, 1981).

Moreover, information asymmetry leads to financial exclusion, which becomes crucial in an era where information technology rules the financial sector. This happens when two parties to a transaction have different levels of knowledge. If these conditions persist, a number of problems might hinder the commercial trading of financial commodities, which might ultimately lead to the denial of financial products to specific groups of people. Because potential borrowers sometimes give lenders (banks) false information about their creditworthiness, financial institutions become more cautious when making loans. In the long run, this raises the risk of a financial crisis and the rate at which loans default. More people may be shut out of the financial network as a result of this increasing focus on the fine print. It has come to light that organisations like banks, especially

in rural regions, are failing to address information asymmetry. Clients are ultimately tempted by this to search for financial items from unapproved sources. On the other hand, producers of unofficial financial products, such as moneylenders, promptly bridge the knowledge gap. As a result, there are minimal to no information costs and minimal transaction costs associated with the financial commodities provided by informal financial product suppliers. A financial system's capacity to function and endure depends on having flawless or almost perfect information. The study finds a strong correlation between economic growth and financial inclusion, which is consistent with the theories of asymmetric information and financial growth. Consequently, poverty is decreased and rural agricultural operations are improved.

The statistical components of the data for this study were analysed employing the common unit roots, PP, and ADF. The research studies utilised the Phillips Perron (PP) and Augmented Dickey-Fuller (ADF) techniques to determine the order of integration of the research variables; whether it is integrated of order 0(1(0) or integrated of order 1(1(1) or both (i.e. the stationarity or non-stationarity), in the data. If the ADF test statistics/Adj. t-Stat. surpasses the critical levels of 1%, 5%, and 10%, it is deemed stationary. The absence of a unit root is the null hypothesis. If the ADF test statistic is less than the crucial values of 1%, 5%, and 10%, the null hypothesis is rejected and the variable is considered non-stationary.

For the ADF and PP variables, real GDP, agricultural credits, and deposits with commercial banks are stationary at first difference. Customers of commercial bank branches and bank borrowers, on the other hand, stay at this level. The result was consistent with prior studies and validated the validity of the model. Nonetheless, the majority of financial experts claim that, providing more credit facilities to the agricultural sector, has significantly impacted positively on the growth and development of economies due to the rise in financial inclusion (Agbenyo et al.,

2019). The primary objective of the research was scrutinised and confirmed by means of verifying the hypothesis that increased financial inclusion will contribute to a nation's economic expansion. Pesaran et al. (2001) state that the approximations for annual time series data should be improved by using time trend in the equation. High R^2 , modest standard errors, and minimal AIC estimates are characteristics of the most successful model. Pesaran et al. (2001) state that the long run coefficients are the best-performing model's estimates. In the event that a longitudinal connection between the underlying parameters is discovered, further research needs to be done to avoid incorrect regression. The appropriate model (number of delays) is automatically selected using the so-called more frugal Akaike Information Criterion (AIC). Therefore, if the F-Statistic exceeds the critical bounds of the t-Statistic at a 5% significance level, a cointegration relationship among the variables in the model is inferred. As a result, it would be reasonable to assume and conclude that there is a longstanding connection between each research variable.

This research employed data from the Bank of Agriculture to assess the connection between financial inclusion, agricultural credit, and economic growth in Nigeria is the focus of this study. The ARDL bounds testing approach to cointegration, introduced by Pesaran et al. (2001), is utilized due to its advantageous statistical features, which surpass those of earlier cointegration techniques. Pesaran et al. (2001) state that even in cases when the variables are co-integrated or integrated with various ordering, the ARDL test process produces accurate results. Additionally, it produces extremely precise estimates for both large and small sample sizes. This method becomes relevant to this inquiry because all of the series are $I(1)$.

Based on this longstanding connection identified here between the variables of interest, it is apparent that an increase in LR GDP will normally increase with time given that real gross domestic product growth lags one while keeping all other variables constant. Consequently, there

is a positive and statistically insignificant correlation between the real gross domestic product for the current year and the real gross domestic product for the previous year. As per the findings of the study, there exists a statistically significant negative link between the quantity of money deposited with commercial banks and real GDP. Similarly, real GDP is positively and statistically significantly impacted by borrowing from commercial banks. This implies that a one percentage point rise in commercial bank borrowers will, on average, lead to an increase in real gross domestic product over the long term, providing all other factors remain constant. Furthermore, the study shows a statistically significant and positive relationship between the density of commercial bank branches and agricultural loans as well as the actual gross domestic product. The idea is that if commercial bank branches and farm loans rise proportionately, the real gross domestic product will also rise proportionately, leading to a gradual improvement in financial inclusion. Nigeria's economic growth and development are greatly aided by long-term financial inclusion.

Additionally, there were estimations of ARDL 1, 1, 2, 1, 2 according to the short-run ARDL model results based on the right delays. The independent variables are the real gross domestic product, the volume of agricultural credits, the quantity of commercial bank borrowers, the density of commercial bank branches, and the selected delays. The real gross domestic product is positive and statistically significant at lag one, according to the estimated model. When it comes to the actual gross domestic product, the number of deposits made with commercial banks is small at lag one but growing at lag two in the near term. The relationship between the number of borrowers with commercial banks and the real gross domestic product is positive at lag two and negative at lag one, although being statistically insignificant at all delays.

Real GDP in Nigeria will rise in response to an increase in agricultural credits, according to the statistical significance and positivity of agricultural credits at lag one. Furthermore, the number of

commercial bank branches and the real gross domestic product have a statistically significant negative short-term correlation. Finally, the R-squared and its adjusted value demonstrate that agricultural loans and financial inclusion account for 96% of the variance in Nigeria's economic growth.

To determine whether past and present values of one variable may be utilised to predict future values of the other, the causal relationship between the two variables was also examined. Our results indicate unidirectional causality, which implies that BCB and CBB could be used to predict Nigeria's real gross domestic product. It is shown that there is a relationship between the real gross domestic product and the number of borrowers with commercial banks and commercial bank borrowers. It also shows how the number of commercial bank branches and the real gross domestic product relate to each other. Still, bidirectional causality is present in the remaining elements, rendering accurate real GDP estimates for Nigeria unfeasible.

Summary of key Findings

To provide the "unbanked" with broad-based financial services including transfers payment facilities, insurance, and credit products, and digital and mobile banking solutions, Financial inclusion aims to integrate them into the larger economy. Financial inclusion does not imply that everyone must utilise the resources at their disposal or that service providers must decide to forgo risks and other expenses in order to provide their products and services. Adverse risk return characteristics and intentional exclusion may hinder a home or small business from utilising one or more of the services, even in the case of unrestricted access. For these results, government assistance is not always required. Rather, policy efforts have to concentrate on correcting defects in the market and eliminating non-market obstacles to obtaining broad-based financial services. Fostering easy access to and use of broad-based financial infrastructure is contingent upon

economic growth. It has drawn attention from a number of developing nations, particularly those in Asia, the Middle East, the Pacific, and Africa, where it was found that the majority of the population was under- or unserved and that rates of financial exclusion were relatively high (Nwanne, 2015; Nwanko & Nwanko, 2015; Williams et al., 2015; IFC, 2014). Conventional financial development metrics are reflective of established policy objectives. The "domestic credit to the private sector" (as a percentage of GDP) has become the most significant indicator of the "depth" of financial expansion due to the emphasis on total capital accumulation. Though it has little to do with "breadth" or financial accessibility, its effect on growth is extensively documented. The only goals that can be substituted for financial access and financial deepening are financial aims. Inclusion is becoming a stand-alone policy goal due to the increasing amount of research showing connections between inclusion and equity, growth, and poverty reduction. Many emerging nations restricted the usage of public funds until the 1980s, concentrating them on small businesses and industries like agriculture. The idea behind these "directed credit" initiatives was that rural poor people could pay market rates or save money, but in order to accumulate savings, they needed loans at subprime rates. Development banks consequently provided loans at rates lower than the market cost of capital to a limited portion of the target populations they had identified. Regulatory limitations periodically restricted deposit rates, which hindered the mobilisation of local resources to finance low-cost loans. Impacts of "financial repression" often resulted in weak financial institutions and systems with limited ability to allocate resources based on risk-return characteristics. Ineffective targeting also resulted in transfers via repressive interest rates, and subsidies adversely affected the functioning of financial institutions. Generally, these initiatives do not improve the impoverished's access to financial services and usually turned out to be unfeasible, especially in rural areas.

The research investigated the effect of agricultural loans and inclusive finance on Fiscal growth utilising data from the Nigerian Bank of Agriculture. The principal aim of the study was to examine the interrelationships between agricultural loans, sustainable inclusive finance, and the growth of the Nigerian economy. By doing this, the research will try to ascertain whether increased lending to the agriculture sector affects financial inclusion and economic growth.

The World Development Indicator (WDI), the Bank of Agriculture, the Central Bank of Nigeria (CBN), and the National Bureau of Statistics (NBS) were among the many sources from which secondary data was gathered. A pre-estimation unit root test was conducted before the regression test in order to determine the integration sequence. The study also made use of a range of statistical testing instruments to evaluate the data. It was necessary to evaluate the research study's validity in light of the data acquired in order to determine the appropriate and pertinent interpretation of the results. It was also intended to ascertain and evaluate if the features of the scale are suitable for use in research.

Outcomes reliability was another pre-estimation exercise performed in the research. Testing the measurement set or instruments for internal consistency also referred to as reliability and consistency was a crucial phase in the research process. Descriptive statistics were employed to assist us in determining the salient characteristics of the data under investigation, much like in biomedical research. These were also provided, in addition to shortened descriptions of the measurements and sample data. These elements were all essential in creating a basic plan for data analytics and interpretations. It is generally acknowledged that quantitative data are described by measures of central tendency and dispersion, and that the normality test we applied provided us with the crucial step required to choose the central tendency measures and statistical techniques for data analysis. Parametric tests were performed to see if our data have a normal distribution.

This stage was crucial since it allowed us to decide whether to compare groups using parametric or non-parametric methods. Descriptive statistical tests were performed to highlight the general data characteristics, such as mean, standard deviation, minimum and maximum, skewness, kurtosis, and Jarque-Bera probability values for all the variables used in the analysis, after data integrity, validity, and reliability had been confirmed. The analysis's results were expected, and they even made recommendations and offered advice:

With the exception of gross domestic product and deposits made with commercial banks, the null hypothesis was accepted for all of the model's variables because their probability value was larger than 5%.

Based on joint normality testing, this indicates that they are normally distributed with probability less than 5%.

The findings of the stationary tests, which were initially run in levels and then in first difference, showed that:

Variables like LCBB and LBCB are integrated at order $I(1)$ because they are stationary at first difference, whereas the variables in the LGDP, LAGRCDT, and LDCB series were integrated at order zero $I(0)$ because they were stationary at level.

The correlational matrix shows that RGDP has a negative correlation with LAGRCDT and LCBB, but a positive connection with LDCB and LBCB. In contrast to the alternative hypothesis, the bound test supported the rejection of the null hypothesis by demonstrating the existence of the co-integration relationship between the model's variables. As a result, it was shown that there was a long-term link between every research variable. The ARDL test for co-integration might now be conducted as a result of this outcome.

The ARDL Co-integrating and Long Run Results show a poor and statistically significant correlation between the DCB and the LRGDP. Furthermore, the outcome demonstrates a favourable and statistically high correlation coefficient among Nigeria's Fiscal expansion and LCBB, LBCB, and LAGRCDT. Furthermore, the ECT coefficient is -0.081194 at a significance level of 5%. This demonstrates that 8.1% of the disequilibrium brought about by the shock in previous years has been re-established in its steady state equilibrium in the current period.

A statistical test of hypothesis that establishes whether one-time series may be used to predict another is the Granger causality test. The hypothesis would be rejected if the probability value at that level is lower than any other level. Most political scientists employ Granger's well-known theory of causation to examine the intertemporal flow of effects between two variables, X and Y. If knowledge about Y's past makes it possible to anticipate X's behavior more precisely than if X's history alone were utilised, that factor is known as the "Granger cause" of X. Consequently, if Y does not Granger Cause X, it is only exogenous to X. When two variables are analysed for Granger causation, it is shown how one variable can provide information for the other's forecast. Outcome of Granger causality test suggests a unidirectional causal interaction among real GDP, the density of commercial bank branches, real GDP and the number of borrowers who have commercial banks. This implies that the real GDP can be predicted with the help of CBB and BCB. The other indicators cannot be used to determine Nigeria's actual GDP because they show bidirectional causality. The Granger causality test is always conducted first, followed by the diagnostic test, which verifies the precision and consistency of the model's computed coefficients. Additional tests include stability tests, heteroscedasticity and normality tests, and autocorrelation.

The findings from the serial correlation test suggest that the model does not exhibit serial correlation, supporting the null hypothesis. Moreover, with a chi-square probability, greater than

5%, it shows that the model's chi-square probability value is greater than 5%. It is thought that the heteroscedasticity issue is unaffected because heteroscedasticity is shown by uneven dispersion. Regression analysis considers the residuals or error term in relation to heteroscedasticity. Specifically, heteroscedasticity characterises a consistent shift in the residuals' distribution across the whole range of observed values. Because ordinal least squares (OLS) regression presumes that all residuals are taken from a population with a constant variance (homoscedasticity), heteroscedasticity is a cause for concern.

A stability test of the model was conducted to ensure that the procedure utilised to produce the data is compatible with the calculated model coefficients. Plots showing the residuals inside the plus/minus range, with the zero line at the center, are shown. It also occurs when a predicted variable's standard deviations do not hold true when contrasted with historical data or a range of values for independent variables. The residual errors exhibit heteroskedasticity as evidenced by their tendency to fan out with time. The test indicates that the residual indicates parameter instability in the equation when it is outside of the standard error bands. The stability test indicates that the model is stable because the CUSUM and CUSUMQ plots of the crucial line stay inside the border with a 5% probability threshold.

The probability value (referred to as p-value) for the Jarque-Bera statistic, which determines if the data have a normal distribution by comparing its value with the Critical threshold, is shown in the normality (distribution) plot. The probability threshold, also referred to as Alpha level, of 0.05 is usually sufficient. At a p-value level of 0.05, there is a 5% probability that the incorrect conclusion that the data do not follow a normal distribution will be made. The null hypothesis is rejected and, it is determined that your data do not follow a normal distribution if the p-value is less than or equal to the significance threshold. A p-value above the significance level

does not necessitate rejection of the null hypothesis. Your claim that the distribution of your data is unusual is not sufficiently supported by the available evidence. The result suggests that the null hypothesis, according to which the residuals are regularly distributed, cannot be completely ruled out.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Preamble

This chapter presents the summary and conclusions of this study. It also discusses the conclusions, counsel, and recommendations drawn from the main findings of the study. Nonetheless, the section begins with some broad observations regarding the implications of this research, which looks at the relationships between three distinct behaviors: economic growth, agricultural credits, and access to and use of the services of Banks, and financial institutions. The research examined the effects of expanding funding to the agricultural sector on inclusive finance and Nigeria's Fiscal growth using historical data from Bank of Agriculture Limited, the leading agricultural finance agency in Nigeria. Numerous scholarly studies have demonstrated that financial inclusion can encourage saving and investing, particularly among the "bottom pyramids," or the lowest-income members of society. They claim that savings supply the necessary cash for enterprises to be operational (Wolfurg & Samir, 2014; Beck et al., 2008).

Furthermore, financial inclusion gives all business owners the opportunity to apply for microloans to raise their standard of living and combat the evils of poverty and misery. This also applies to current low-income borrowers. Small businesses benefit when microloans are used to help entrepreneurs buy more assets. Their ability to accumulate more assets is increased by this source of income, which eventually leads to economic expansion and emancipation. Globally, inclusive finance is promoted by Enhancing Financial Innovation & Access (EFINA), an organisation devoted to the advancement of the financial sector. It provides a platform where anyone interested in the subject of financial inclusion may access the surveys they have been conducting.

Through its surveys, EFINA has gained additional insight into the ways in which financially engaged business owners choose to work with financial service providers to finalise their transactions and obtain a variety of resources, such as advances, credits, and loans. They have expanded their scopes and grown into a reliable and trustworthy source of data for scholars, researchers, and decision-makers on the esteemed topic of financial inclusion globally since the start of their surveys in 2008. In line with global best practices, the the Apex Bank in Nigeria has started leveraging survey data to expand its knowledge base thereby informing strategic decision-making on key national priorities. Nigeria has a latent credit desire, according to the EFInA poll conducted in 2012.

According to the survey study, of the 12.9 million people who had taken out loans in the previous year, only 0.9 million (7%) and 0.7 million (5.4%) did so through deposit money banks (DMBs) and micro financing banks (MFBs), respectively. Consequently, nine out of ten of these adults, or 76% of them, borrowed money from friends and family. According to the polls, the three biggest obstacles to opening an account with a Deposit Money Bank (DMB) or microfinance bank are distance from a bank, unemployment, and irregular income. Many of Nigeria's low-income and impoverished people did not have jobs. With the unemployment rate reaching record highs, there has been a frequent call in recent years for job seekers to shift their focus from looking for white-collar positions to entrepreneurship. In addition to assisting people in generating income, entrepreneurship responds to social needs, which promotes the development and expansion of a nation's economy. According to the Financial Access 2010 report, small and medium-sized farmers who normally account for 67% of the formal employment in the industrial sector are crucial to sustaining economic growth. Furthermore, it stated that SMEs generally contribute 29% and 49%

of the official GDP in low-income nations and high-income countries (CGAP and World Bank, 2010).

Nigeria's agricultural economy is particularly affected because lack of access to finance for agriculture inputs, processing, and commerce significantly impedes increased economic performance in the rural sector. Financial institutions enjoy supporting major trading organisations and global enterprises. Because of this, even after the CBN established the Agricultural Credit Guarantee Scheme Fund (ACGSF) and the Nigerian Incentive, Risk-based System for Agricultural Lending (NIRSAL), two powerful guarantee institutions meant to help lower the incidence and occurrence of risks related to financing the agricultural sector, many DMBs still decide not to lend to the agricultural sector because they view it as high risk. Due to the lack of interest in agribusinesses, these impoverished farmers, whose primary attention must be farming the land, sometimes turn to family members or nearby moneylenders for loans at high interest rates. Since money lenders receive fees in exchange for their cost of capital, which is interest, the interest rates that money lenders charge have no positive impact on reducing poverty. This perpetuates a cycle of poverty and misery for the disadvantaged and low-income people. It is necessary to close this financial gap through easily available, reasonably priced, flexible, and plentiful financing options in order to prevent this disastrous course of events and encourage entrepreneurship. As a result, financial inclusion is viewed as the magic bullet that will enable everyone to obtain credit, no matter how small. In this sense, the microfinance sector has expanded over time as an economic growth tactic intended to support low-income individuals, combat poverty, and reduce income inequality.

Agricultural development banks, or ADBs, stimulate economic growth, especially in periods of global economic crisis (Seibel, 2000). He contended that the ADB's operations have to

be strictly regulated in order to support sustainable economic growth and development. Cull, Ehrbeck, & Holle, 2014; Beck, Demirguc-Kunt, Laeven, & Levine, 2008; Beck, Levine, & Loayza, (2000), supported this position, and argued that toying along this path, shall indeed ensure that majority of the economically active population especially the poor and vulnerable, have easy access to broad-based financial services, which with time will cause the development of an enduring inclusive financial system and markets.

It is, therefore, crucial to conduct this study in order to respond to earlier research questions raised in chapter 1 of this study. The metric employed in this study was real Gross Domestic Product (GDP), which serves as a comprehensive indicator of economic activity. As a result, this indicator measures the economic growth rate. The reason the GDP is used is that it takes into consideration all economic activity in the real economic sectors, such as manufacturing, agriculture, services, and industry. Agricultural credit, also known as AGRCDT, is a proxy for agricultural credit extended to farmers that is based on the amount of agricultural loans and advances made out by all financial institutions in the country.

However, as it relates to low-income workers specifically, financial inclusion in this study's context refers to the degree of involvement or participation in financial activities. To assess financial inclusion (FI), we employed three metrics: the density of commercial Bank Branches, the volume of commercial Bank deposits, and the extent of commercial bank agricultural credit. They act as proxies for financial inclusion instead of the latter. The ARDL bound testing approach was used in light of earlier studies by Wonder et al. (2019); Bassey et al. (2017); and Olaniyi (2017a) which demonstrated positive correlations between inclusive finance, agricultural credit, and Fiscal growth in varying degrees and directions of causality. The following additional analyses were performed in addition to regression analysis in order to confirm the empirical findings:

To ensure the validity and reliability of the results, a comprehensive battery of tests was conducted. These included the deployment of:

Unit root tests and descriptive statistics to examine the properties of the data, Pre- and post-estimation tests to evaluate model performance, Correlation coefficient matrix to assess pairwise relationships, Bounds testing for long-run cointegration. Others are, Granger causality tests to examine directional relationships, Diagnostic tests, comprising of heteroscedasticity, autocorrelation, and serial correlation tests, Ramsey RESET test to evaluate model specification, and Normality and stability tests to assess the distributional properties of the residuals. Furthermore, the Autoregressive Distributed Lag (ARDL) model was employed to simultaneously estimate both long-run and short-run relationships among the variables.

Implications

To reduce inequality, poverty, unemployment and improve the Nigeria's financial system, the Bank of Agriculture (BOA) was established with the goals of promoting agriculture, fostering community development, and human growth (NDP, 2021). Despite all the resources available to it, Nigeria continues to have an unequal income distribution, which worsens the gap between the rich and the poor. According to Awe and Olawumi (2012) less than 10% of Nigerians own more than half of the nation's wealth. In 2012, 67.1%, now 40% (World Bank, 2022) of Nigerians were estimated to be living below the poverty line, despite continuous GDP development (NER, 2012; NBS, 2012). Paradoxically, GDP growth is viewed by economists as a "exclusive economy" since it has no effect on raising people's general standards of living, employment opportunities, or poverty rates (Khan, 2012).

The study examined the implications of farmers' increased access to agricultural credit options, sustainable financial inclusion, and Nigeria's economic development using the Bank of Agriculture as a case study. Agricultural Development Banks are acknowledged to accelerate economic growth and development (Agodi & Johnson, 2012; Seibel, 2000). Consequently, Ag.DB fosters economic growth and expands financial inclusion for the families of farmers by providing subsidies for agricultural activities (Cuu, et al., 2014; Beck et al., 2008; Beck, et al., 2000).

A developing market and an inclusive financial system require the eradication of poverty and the maintenance of social cohesion. Furthermore, access to financial creation gives poor persons more power by enabling them to create bank accounts, save money, and make wise investments (World Bank Group, 2020). This study set out to look into Nigeria's financial isolation. We looked at the financial inclusion strategies used by the Bank of Agriculture and other comparable financial institutions to help Nigeria's economy flourish. The study's findings point to important factors that significantly influence Nigeria's economic development and growth. The three main pillars of the study were financial inclusion, agricultural credits, and economic growth. It is important to employ relevant theories and previous empirical research in order to identify the factors that drive Nigeria's economic growth. Nigeria's economic development is influenced by a multitude of factors, including but not limited to economic growth, a stable financial system, exports, interest rates, population growth, inflation, foreign direct investment (FDI), private investment, and public investment.

Interestingly, the study reveals that access to agricultural credit and financial inclusion in Nigeria are significantly driven by economic growth. This underscores the critical role of economic growth in fostering development and financial expansion. In line with contemporary development paradigms, this component is vital for achieving sustainable growth and financial

stability. Based on the study's key findings and contributions, several policy implications are proposed. Notably, the bounds test results indicate that all the study's variables exhibit a long-run or cointegration relationship.

The primary aim of this research project is to examine the connection between Nigeria's economic growth and financial inclusion. It attempted to look into and assess the effect of agricultural credits on Nigeria's Fiscal expansion through the Bank of Agriculture (BOA). The findings showed a statistically significant and favorable correlation between agricultural lending and Nigeria's economic growth. The findings indicate that a given percentage increase in agricultural lending will correspond with a corresponding percentage rise in economic growth, hence enhancing financial inclusion. The outcomes of this study are in agreement with the findings of Adesanya & Ajala (2018), which demonstrated that agricultural credits are a significant factor determining Nigeria's overall output. According to Olaniyi (2017), the utilization of financial services has adverse effects on agriculture, manifesting in both short-term and long-term consequences. The findings of this study suggest that enhancing financial inclusion is crucial for sustaining the steady growth of rural agriculture. Furthermore, the rejection of the null hypothesis in favor of the alternative hypothesis, which posits a significant relationship between agricultural loans and Nigeria's economic growth, lends credence to the study's validity.

A long-term, statistically significant positive relationship between commercial bank borrowers and real gross domestic product is indicated by the coefficient of commercial bank borrowers with a positive sign. This relationship demonstrates that a one percentage point increase in commercial bank borrowers will, on average, lead to a rise in economic growth, presuming all other factors stay unchanged. The results of related studies (Adedokun & Aga, 2020; Moise & Xu, 2018) indicate that financial inclusion and economic growth are positively correlated over the long

run. The results of those researches are in line with this view. However, a study by Otiwu et al. (2018) indicated a negative association between inclusive finance and Fiscal growth, and this, runs counter to this finding. Contrary to the findings of Sharma (2016), existing literature on Granger Causality suggests that financial inclusion does not have a significant causal effect on economic growth. Sharma; s findings, revealed unidirectional causality between commercial bank deposits as a proxy for financial inclusion and real gross domestic product. Our analysis indicated bidirectional causality in Nigeria.

Recommendations for Application

The findings from this study, gives rise to the following recommendations:

Financial transactions become accessible, affordable, as a result of a simpler process, and subsidy by Government. As a result, consumers, especially the less privileged feel more comfortable using financial services. Additionally, equality promotes income growth and levels of equality, eradicates poverty, and strengthens the economy's resistance to shocks from the outside world.

In light of the first objective of our research, which was to ascertain if financial inclusion had a noteworthy long-term effect on economic growth, we found results that agreed with the studies conducted by Mose and Xu (2018), and Adedokun and Aga (2020). Thus, this study recommends that a public education campaign be started for low-income workers and rural farmers, stressing the benefits of financial inclusion to everyone using multiple languages, instead of concentrating on the middle class and the elite as it currently does. This is not something that should be handled by the banks alone. Together, the government, CBN, and banks need to establish a robust translation department inside their PR department so that the CBN financial inclusion policies may

be made available in the primary indigenous languages. To effectively reach underserved and unbanked communities, the expansion of financial services access points should leverage financial services geospatial mapping technology. Nigeria should also prioritise creating a framework for consumer protection and improving ICT/E-banking technologies. An intensive effort should be undertaken to modernise public infrastructure that are required to enhance mobile communication networks to improve financial services. It is also suggested that financial sector regulators be required to create laws that compel financial service providers to grow. Quickly implement the agent banking architecture on joint ventures, shared infrastructure, etc. to encourage a significant uptake of savings and payment services.

The study's second goal is to look at how agricultural credits through the Bank of Agriculture (BOA) impact Nigeria's economic development. The empirical result shows a robust correlation between agricultural credits and Nigeria's economic growth. This finding is corroborated by research conducted by Adesanya and Ajala (2018), and Olaniyi (2017) which found that agricultural credits significantly affect Nigeria's total agricultural output. According to the research, the Bank of Agriculture has to improve and expand its lending activities to accommodate all agricultural value chains, and other agro-allied businesses. Promoting inclusion, increasing production, and advancing the economy all require funding other aspects of rural development. The investigation's conclusion demonstrated the significance of agricultural credits in impacting economic development all round about. Therefore, it goes without saying that without an efficient financial system to provide credits that will drive farm activities, for the farmer to produce food for human and animal consumptions and raw materials for the manufacturing and industrial sectors, the economy cannot grow. Taking into account the enormous potentials and vast opportunities that abound in agriculture in most African economies, including Nigeria, agriculture

can be said to be the melting pot through which most economies grow and prosper. The Governments in Nigeria should therefore, educate and train lending organisations about the value of providing credits, especially small-scale farm credits in sufficient quantity, doing so through more efficient banking products and Services from Bank of Agriculture (BOA), Commercial Banks, and other financial institutions. This will inspire more farmers to produce on large scales, thereby increasing the country's total factor productivity. Governments should be more aggressive in incentivising the private sector, especially the financial industry, to set aside funds annually to support government initiatives. As a matter of necessity, Governments at all levels must support the sector by putting in place requisite infrastructure necessary for farming activities to go on without much challenges. Through the Bank of Agriculture (BOA), the Federal Government must first carry out a thorough evaluation of agricultural Credit schemes in order to simplify them to suit contemporary dynamics and for the benefit of Nigerian residents.

The outcome of this research has provided some insight into the kind of policies and structures that Governments, donor agencies, and regulatory Authorities, especially the Ministries of Agriculture & Food Security, CBN, and the Presidency, should put in place to guarantee ceaseless funding availability for agricultural endeavours. This becomes more glaring now with the findings of this research study, pointing to an empirical evidence regarding the impact of credit availability on growth of the national economy. This result can be relied upon as a solid framework for creating agricultural policies and programmes that will guarantee effective allocation of scarce resources among the nation's competing sectors.

The study will be important for farmers. It will educate them on the availability, and critical role that external credit facilities play in improving their farming operations and yield, as well as in raising their revenue through higher productivity.

The extensive comprehensive dataset will serve as a valuable resource for future research on agricultural credit, inclusive finance and economic growth, both in Nigeria and globally.

The study's findings suggest a positive correlation between Nigeria's economic growth and Financial inclusion, implying that a long-term, sustainable relationship exists between the two variables. The study concludes that while the Nigerian government established robust agricultural financing policies to bolster food production, these measures were deemed ineffectual since the intended outcomes were not attained. To ensure that these projects succeed, the following steps are advised.

It is necessary to set appropriate budgetary releases and allocations in order to fund policy efforts, evaluating ongoing programmes and modifying present arrangements to enhance their support of agricultural output. For example, BOA needs to change into a wholesale and retail finance organisation in order to improve the sustainability and efficiency of its operations.

Creating financial plans based on specific agricultural products in order to boost local production of industrial raw materials, lower imports, and produce foreign exchange in areas where the nation has a comparative advantage.

To boost institutional capacity, training and capacity-building should be given to employees of institutions that implement policies, such as banks, ministries of agriculture, the CBN, and others. Additionally, loan recipients should receive training and capacity-building on managing their business and finances. Creating farmers' cooperatives is an excellent approach to give farmers practical education that teaches them to be prudent, accountable, and responsible, as well as skilled management.

To attract more borrowers, the operators must to reduce the transaction fees charged to financial institutions taking part in financing schemes. Additionally, they ought to incorporate cooperatives and neighborhood-based self-help groups in the credit distribution system.

Simplifying credit administration operating procedures can help cut expenses and bureaucracy. Most policy initiatives also ask for changing funding arrangements, such as interest rates, eligibility requirements, legal rights, etc., in order to enhance access.

In order to reduce default problems, loans are made to groups of farmers (self-help groups or cooperatives are established), and financing is integrated with input supply and output marketing.

Financial institutions must supervise and regulate all distributed facilities to avoid noncompliance, insider abuse, and defaults. The Central Bank of Nigeria must also appropriately and cautiously carry out its regulatory duties toward all banks.

The majority of people living in Nigeria's rural areas are farmers, who rely on farming and other rural-based economic activities to make ends meet. Enhancing rural infrastructure, increasing productivity, and improving the competitiveness of farm goods would require a significant amount of strategically targeted investment in agriculture if Nigeria is to meet its goal of rural development through agricultural financing policies.

Recommendations for Future Research

Given the limitations of this study, numerous avenues for future research in relevant fields remain unexplored. One potential direction for future studies on inclusive finance and improving livelihoods, is the application of suitable models to further investigate the connection between these variables. Access to banking services/infrastructure has been shown to be a crucial factor in reducing penury in Nigeria, and further research can build upon this finding. This study employed the ARDL methodology to examine the impact of agricultural loans and inclusive finance on the expansion of the Nigerian economy, highlighting the need for future research to utilize nonlinear ARDL models. This approach will provide a more nuanced understanding of the complex interplay

among access to, and use of financial services, agricultural loans, and expansion of Nigeria's economy, enabling policymakers to develop targeted interventions to address asymmetric responses. Furthermore, future research could expand upon this study's findings by investigating the effects of financial inclusivity and agricultural loans on economic expansion in other African countries. The importance of inclusive finance and agricultural funding for fiscal expansion of any economy cannot be overstated. The results of this investigation provide a valuable framework for future research and policy initiatives, offering insights for stakeholders seeking to promote economic growth and reduce poverty in Nigeria and beyond.

The importance of financial inclusion and agricultural funding for driving sustainable development cannot be overstated as they play a vital role in fostering growth, and development. The findings of this investigation offers a valuable framework to policymakers, researchers, and stakeholders seeking to promote fiscal expansion, reduce poverty, and improve livelihoods in Nigeria, Africa and globally. Studying the impact of financial inclusion (FI) can help Bank managers to come up with new ways to tackle existing issues. Therefore, it seems reasonable to suggest that banks and other financial institutions fund future research on the effects of agricultural lending and inclusive finance on the growth of GDP . African governments should finance research aiming at decreasing poverty and promoting financial inclusion, given the significance that financial inclusion and agricultural financing play in promoting economic progress.

This would help the Central Bank of Nigeria and other African central banks by advancing fiscal and financial policies that will support economic development and growth. Restructuring the financial system will be necessary for governments and policymakers to end hunger by 2030 and beyond. This will improve livelihoods, increase wealth, and help fight poverty.

Conclusions of Research Study

Improving a nation's official financial system will boost financial inclusion, income levels, and public financial knowledge. The findings of this research reveal that the development strategy that is critical to the long-term viability of inclusive finance in Nigeria is access to and use of bank products, especially so, in rural areas. Only large corporations and a specific subset of workers in the public and private sectors are eligible for financing. Because more people in Nigeria, especially in remote communities, need access to financing and inclusive finance, the country's significant economic progress over the past 10 years is not reaching those who need it the most.

The evidence from this research reveals a strong correlation linking access to financial services, agricultural loans, and Fiscal expansion of the Nigerian economy. It also demonstrated how positively and significantly the financial inclusion policy influences Nigeria's Fiscal progress. Access to and use of Financial services among Nigerian farmers is hampered by admission to financial services, financing of agricultural activities, poor entry points to financial services, and inadequate infrastructure. This study emphasised that the sustainability of financial inclusion for Nigerians living in rural areas is a prerequisite for economic growth in Nigeria and all other countries.

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APPENDICES

APPENDIX A: Formatting Appendices

UNIT ROOT TEST

LAGRCDT

UNIT ROOT TEST ADF @LEVEL

Null Hypothesis: LAGRCDT has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.576789	0.0163
Test critical values:		
1% level	-3.808546	
5% level	-3.020686	
10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LAGRCDT)

Method: Least Squares

Date: 01/31/23 Time: 00:13

Sample (adjusted): 2002 2021

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LAGRCDT(-1)	-0.401973	0.112384	-3.576789	0.0022
C	3.675101	0.997890	3.682870	0.0017
R-squared	0.415460	Mean dependent var		0.133821
Adjusted R-squared	0.382985	S.D. dependent var		0.709775
S.E. of regression	0.557531	Akaike info criterion		1.764041
Sum squared resid	5.595130	Schwarz criterion		1.863615
Log likelihood	-15.64041	Hannan-Quinn criter.		1.783479
F-statistic	12.79342	Durbin-Watson stat		1.824446
Prob(F-statistic)	0.002156			

Null Hypothesis: LAGRCDT has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.342936	0.3946
Test critical values:		
1% level	-4.498307	

5% level	-3.658446
10% level	-3.268973

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LAGRCDT)

Method: Least Squares

Date: 01/31/23 Time: 00:14

Sample (adjusted): 2002 2021

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LAGRCDT(-1)	-0.433021	0.184820	-2.342936	0.0316
C	3.868298	1.362976	2.838126	0.0114
@TREND("2001")	0.007650	0.035555	0.215168	0.8322
R-squared	0.417047	Mean dependent var		0.133821
Adjusted R-squared	0.348464	S.D. dependent var		0.709775
S.E. of regression	0.572915	Akaike info criterion		1.861322
Sum squared resid	5.579933	Schwarz criterion		2.010681
Log likelihood	-15.61322	Hannan-Quinn criter.		1.890478
F-statistic	6.080938	Durbin-Watson stat		1.754996
Prob(F-statistic)	0.010183			

@FIRST DIFF LAGRCRDT

Null Hypothesis: D(LAGRCDT) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.381886	0.0001
Test critical values:		
1% level	-3.831511	
5% level	-3.029970	
10% level	-2.655194	

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

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LAGRCDT,2)

Method: Least Squares

Date: 01/31/23 Time: 00:15

Sample (adjusted): 2003 2021

Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(LAGRCDT(-1))	-1.129439	0.176976	-6.381886	0.0000
C	0.045266	0.127939	0.353807	0.7278
R-squared	0.705518	Mean dependent var		-0.112650
Adjusted R-squared	0.688195	S.D. dependent var		0.979851
S.E. of regression	0.547143	Akaike info criterion		1.731089
Sum squared resid	5.089222	Schwarz criterion		1.830504
Log likelihood	-14.44535	Hannan-Quinn criter.		1.747914
F-statistic	40.72847	Durbin-Watson stat		1.742965
Prob(F-statistic)	0.000007			

Null Hypothesis: D(LAGRCDT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.251274	0.0001
Test critical values:		
1% level	-4.532598	
5% level	-3.673616	
10% level	-3.277364	

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

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LAGRCDT,2)
Method: Least Squares
Date: 01/31/23 Time: 00:16
Sample (adjusted): 2003 2021
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LAGRCDT(-1))	-1.335485	0.184172	-7.251274	0.0000
C	0.659201	0.298385	2.209227	0.0421
@TREND("2001")	-0.053193	0.023849	-2.230396	0.0404
R-squared	0.775362	Mean dependent var		-0.112650
Adjusted R-squared	0.747282	S.D. dependent var		0.979851
S.E. of regression	0.492582	Akaike info criterion		1.565626
Sum squared resid	3.882186	Schwarz criterion		1.714748
Log likelihood	-11.87345	Hannan-Quinn criter.		1.590863
F-statistic	27.61281	Durbin-Watson stat		1.787991
Prob(F-statistic)	0.000006			

LAGRCDT

UNIT ROOT TEST PP @LEVEL

Null Hypothesis: LAGRCDT has a unit root

Exogenous: Constant

Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.556953	0.0170
Test critical values:		
1% level	-3.808546	
5% level	-3.020686	
10% level	-2.650413	

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

Residual variance (no correction)	0.279756
HAC corrected variance (Bartlett kernel)	0.287685

Phillips-Perron Test Equation

Dependent Variable: D(LAGRCDT)

Method: Least Squares

Date: 01/31/23 Time: 00:18

Sample (adjusted): 2002 2021

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LAGRCDT(-1)	-0.401973	0.112384	-3.576789	0.0022
C	3.675101	0.997890	3.682870	0.0017
R-squared	0.415460	Mean dependent var		0.133821
Adjusted R-squared	0.382985	S.D. dependent var		0.709775
S.E. of regression	0.557531	Akaike info criterion		1.764041
Sum squared resid	5.595130	Schwarz criterion		1.863615
Log likelihood	-15.64041	Hannan-Quinn criter.		1.783479
F-statistic	12.79342	Durbin-Watson stat		1.824446
Prob(F-statistic)	0.002156			

Null Hypothesis: LAGRCDT has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.375210	0.3796
Test critical values:		
1% level	-4.498307	
5% level	-3.658446	
10% level	-3.268973	

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

Residual variance (no correction)	0.278997
HAC corrected variance (Bartlett kernel)	0.295866

Phillips-Perron Test Equation
 Dependent Variable: D(LAGRCDT)
 Method: Least Squares
 Date: 01/31/23 Time: 00:19
 Sample (adjusted): 2002 2021
 Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LAGRCDT(-1)	-0.433021	0.184820	-2.342936	0.0316
C	3.868298	1.362976	2.838126	0.0114
@TREND("2001")	0.007650	0.035555	0.215168	0.8322
R-squared	0.417047	Mean dependent var		0.133821
Adjusted R-squared	0.348464	S.D. dependent var		0.709775
S.E. of regression	0.572915	Akaike info criterion		1.861322
Sum squared resid	5.579933	Schwarz criterion		2.010681
Log likelihood	-15.61322	Hannan-Quinn criter.		1.890478
F-statistic	6.080938	Durbin-Watson stat		1.754996
Prob(F-statistic)	0.010183			

PP@FIRST DIFF LAGRCDT

Null Hypothesis: D(LAGRCDT) has a unit root
 Exogenous: Constant
 Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-6.208127	0.0001
Test critical values:		
1% level	-3.831511	
5% level	-3.029970	
10% level	-2.655194	

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

Warning: Probabilities and critical values calculated for 20 observations
 and may not be accurate for a sample size of 19

Residual variance (no correction)	0.267854
HAC corrected variance (Bartlett kernel)	0.300528

Phillips-Perron Test Equation

Dependent Variable: D(LAGRCDT,2)

Method: Least Squares

Date: 01/31/23 Time: 00:20

Sample (adjusted): 2003 2021

Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LAGRCDT(-1))	-1.129439	0.176976	-6.381886	0.0000
C	0.045266	0.127939	0.353807	0.7278
R-squared	0.705518	Mean dependent var		-0.112650
Adjusted R-squared	0.688195	S.D. dependent var		0.979851
S.E. of regression	0.547143	Akaike info criterion		1.731089
Sum squared resid	5.089222	Schwarz criterion		1.830504
Log likelihood	-14.44535	Hannan-Quinn criter.		1.747914
F-statistic	40.72847	Durbin-Watson stat		1.742965
Prob(F-statistic)	0.000007			

Null Hypothesis: D(LAGRCDT) has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-7.251274	0.0001
Test critical values:		
1% level	-4.532598	
5% level	-3.673616	
10% level	-3.277364	

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

Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19

Residual variance (no correction)	0.204326
HAC corrected variance (Bartlett kernel)	0.204326

Phillips-Perron Test Equation

Dependent Variable: D(LAGRCDT,2)

Method: Least Squares

Date: 01/31/23 Time: 00:21

Sample (adjusted): 2003 2021

Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LAGRCDT(-1))	-1.335485	0.184172	-7.251274	0.0000
C	0.659201	0.298385	2.209227	0.0421
@TREND("2001")	-0.053193	0.023849	-2.230396	0.0404
R-squared	0.775362	Mean dependent var		-0.112650

Adjusted R-squared	0.747282	S.D. dependent var	0.979851
S.E. of regression	0.492582	Akaike info criterion	1.565626
Sum squared resid	3.882186	Schwarz criterion	1.714748
Log likelihood	-11.87345	Hannan-Quinn criter.	1.590863
F-statistic	27.61281	Durbin-Watson stat	1.787991
Prob(F-statistic)	0.000006		

LBCB @LEVEL ADF

Null Hypothesis: LBCB has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.885843	0.3316
Test critical values: 1% level	-3.808546	
5% level	-3.020686	
10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LBCB)

Method: Least Squares

Date: 01/31/23 Time: 00:23

Sample (adjusted): 2002 2021

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LBCB(-1)	-0.368148	0.195216	-1.885843	0.0756
C	0.538039	0.284689	1.889920	0.0750
R-squared	0.164981	Mean dependent var		0.001505
Adjusted R-squared	0.118591	S.D. dependent var		0.048570
S.E. of regression	0.045599	Akaike info criterion		-3.243217
Sum squared resid	0.037427	Schwarz criterion		-3.143644
Log likelihood	34.43217	Hannan-Quinn criter.		-3.223780
F-statistic	3.556403	Durbin-Watson stat		1.584822
Prob(F-statistic)	0.075560			

Null Hypothesis: LBCB has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 3 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.564191	0.0642
Test critical values: 1% level	-4.616209	
5% level	-3.710482	

10% level -3.297799

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

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 17

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LBCB)

Method: Least Squares

Date: 01/31/23 Time: 00:23

Sample (adjusted): 2005 2021

Included observations: 17 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LBCB(-1)	-2.336265	0.655482	-3.564191	0.0044
D(LBCB(-1))	1.585150	0.506120	3.131968	0.0095
D(LBCB(-2))	1.287677	0.434100	2.966313	0.0128
D(LBCB(-3))	0.820720	0.344929	2.379388	0.0365
C	3.567427	1.011563	3.526648	0.0047
@TREND("2001")	-0.013631	0.005178	-2.632671	0.0233
R-squared	0.580590	Mean dependent var		0.002879
Adjusted R-squared	0.389949	S.D. dependent var		0.052801
S.E. of regression	0.041241	Akaike info criterion		-3.268205
Sum squared resid	0.018709	Schwarz criterion		-2.974129
Log likelihood	33.77974	Hannan-Quinn criter.		-3.238973
F-statistic	3.045464	Durbin-Watson stat		2.199332
Prob(F-statistic)	0.057507			

LBCB@FIRST DIFF ADF

Null Hypothesis: D(LBCB) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.742049	0.0120
Test critical values:		
1% level	-3.831511	
5% level	-3.029970	
10% level	-2.655194	

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

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LBCB,2)

Method: Least Squares

Date: 01/31/23 Time: 00:24

Sample (adjusted): 2003 2021

Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LBCB(-1))	-0.978344	0.261446	-3.742049	0.0016
C	0.001966	0.011789	0.166768	0.8695
R-squared	0.451665	Mean dependent var		0.004483
Adjusted R-squared	0.419410	S.D. dependent var		0.067328
S.E. of regression	0.051302	Akaike info criterion		-3.002891
Sum squared resid	0.044741	Schwarz criterion		-2.903477
Log likelihood	30.52747	Hannan-Quinn criter.		-2.986066
F-statistic	14.00293	Durbin-Watson stat		1.874439
Prob(F-statistic)	0.001623			

Null Hypothesis: D(LBCB) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.943230	0.0305
Test critical values: 1% level	-4.532598	
5% level	-3.673616	
10% level	-3.277364	

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

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LBCB,2)

Method: Least Squares

Date: 01/31/23 Time: 00:24

Sample (adjusted): 2003 2021

Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LBCB(-1))	-1.030612	0.261362	-3.943230	0.0012
C	-0.026939	0.026433	-1.019140	0.3233
@TREND("2001")	0.002615	0.002148	1.217583	0.2410
R-squared	0.498163	Mean dependent var		0.004483
Adjusted R-squared	0.435434	S.D. dependent var		0.067328
S.E. of regression	0.050589	Akaike info criterion		-2.986240
Sum squared resid	0.040947	Schwarz criterion		-2.837118
Log likelihood	31.36928	Hannan-Quinn criter.		-2.961003
F-statistic	7.941442	Durbin-Watson stat		1.931848
Prob(F-statistic)	0.004023			

LBCB@LEVEL PP

Null Hypothesis: LBCB has a unit root

Exogenous: Constant

Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-1.885843	0.3316
Test critical values:		
1% level	-3.808546	
5% level	-3.020686	
10% level	-2.650413	

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

Residual variance (no correction)	0.001871
HAC corrected variance (Bartlett kernel)	0.001871

Phillips-Perron Test Equation

Dependent Variable: D(LBCB)

Method: Least Squares

Date: 01/31/23 Time: 00:25

Sample (adjusted): 2002 2021

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LBCB(-1)	-0.368148	0.195216	-1.885843	0.0756
C	0.538039	0.284689	1.889920	0.0750
R-squared	0.164981	Mean dependent var		0.001505
Adjusted R-squared	0.118591	S.D. dependent var		0.048570
S.E. of regression	0.045599	Akaike info criterion		-3.243217
Sum squared resid	0.037427	Schwarz criterion		-3.143644
Log likelihood	34.43217	Hannan-Quinn criter.		-3.223780
F-statistic	3.556403	Durbin-Watson stat		1.584822
Prob(F-statistic)	0.075560			

Null Hypothesis: LBCB has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-1.315519	0.8537
Test critical values:		
1% level	-4.498307	
5% level	-3.658446	
10% level	-3.268973	

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

Residual variance (no correction)	0.001871
HAC corrected variance (Bartlett kernel)	0.001871

Phillips-Perron Test Equation
 Dependent Variable: D(LBCB)
 Method: Least Squares
 Date: 01/31/23 Time: 00:26
 Sample (adjusted): 2002 2021
 Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LBCB(-1)	-0.372498	0.283157	-1.315519	0.2058
C	0.544967	0.432200	1.260914	0.2244
@TREND("2001")	-5.59E-05	0.002565	-0.021800	0.9829
R-squared	0.165005	Mean dependent var		0.001505
Adjusted R-squared	0.066770	S.D. dependent var		0.048570
S.E. of regression	0.046920	Akaike info criterion		-3.143245
Sum squared resid	0.037426	Schwarz criterion		-2.993885
Log likelihood	34.43245	Hannan-Quinn criter.		-3.114089
F-statistic	1.679697	Durbin-Watson stat		1.579585
Prob(F-statistic)	0.215931			

LBCB@FIRST DIFF PP

Null Hypothesis: D(LBCB) has a unit root
 Exogenous: Constant
 Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.742049	0.0120
Test critical values:		
1% level	-3.831511	
5% level	-3.029970	
10% level	-2.655194	

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

Warning: Probabilities and critical values calculated for 20 observations
 and may not be accurate for a sample size of 19

Residual variance (no correction)	0.002355
HAC corrected variance (Bartlett kernel)	0.002355

Phillips-Perron Test Equation
 Dependent Variable: D(LBCB,2)
 Method: Least Squares

Date: 01/31/23 Time: 00:26
Sample (adjusted): 2003 2021
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LBCB(-1))	-0.978344	0.261446	-3.742049	0.0016
C	0.001966	0.011789	0.166768	0.8695
R-squared	0.451665	Mean dependent var		0.004483
Adjusted R-squared	0.419410	S.D. dependent var		0.067328
S.E. of regression	0.051302	Akaike info criterion		-3.002891
Sum squared resid	0.044741	Schwarz criterion		-2.903477
Log likelihood	30.52747	Hannan-Quinn criter.		-2.986066
F-statistic	14.00293	Durbin-Watson stat		1.874439
Prob(F-statistic)	0.001623			

Null Hypothesis: D(LBCB) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.943230	0.0305
Test critical values:		
1% level	-4.532598	
5% level	-3.673616	
10% level	-3.277364	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Residual variance (no correction)	0.002155
HAC corrected variance (Bartlett kernel)	0.002155

Phillips-Perron Test Equation
Dependent Variable: D(LBCB,2)
Method: Least Squares
Date: 01/31/23 Time: 00:27
Sample (adjusted): 2003 2021
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LBCB(-1))	-1.030612	0.261362	-3.943230	0.0012
C	-0.026939	0.026433	-1.019140	0.3233
@TREND("2001")	0.002615	0.002148	1.217583	0.2410
R-squared	0.498163	Mean dependent var		0.004483
Adjusted R-squared	0.435434	S.D. dependent var		0.067328
S.E. of regression	0.050589	Akaike info criterion		-2.986240
Sum squared resid	0.040947	Schwarz criterion		-2.837118

Log likelihood	31.36928	Hannan-Quinn criter.	-2.961003
F-statistic	7.941442	Durbin-Watson stat	1.931848
Prob(F-statistic)	0.004023		

LCBB@LEVEL ADF

Null Hypothesis: LCBB has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.513804	0.5062
Test critical values:		
1% level	-3.808546	
5% level	-3.020686	
10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(LCBB)
 Method: Least Squares
 Date: 01/31/23 Time: 00:29
 Sample (adjusted): 2002 2021
 Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCBB(-1)	-0.260457	0.172055	-1.513804	0.1474
C	0.182621	0.123644	1.476988	0.1570
R-squared	0.112934	Mean dependent var		-0.003790
Adjusted R-squared	0.063652	S.D. dependent var		0.051511
S.E. of regression	0.049845	Akaike info criterion		-3.065172
Sum squared resid	0.044721	Schwarz criterion		-2.965599
Log likelihood	32.65172	Hannan-Quinn criter.		-3.045735
F-statistic	2.291603	Durbin-Watson stat		1.476966
Prob(F-statistic)	0.147437			

Null Hypothesis: LCBB has a unit root
 Exogenous: Constant, Linear Trend
 Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.490421	0.7985
Test critical values:		
1% level	-4.498307	
5% level	-3.658446	
10% level	-3.268973	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LCBB)

Method: Least Squares

Date: 01/31/23 Time: 00:29

Sample (adjusted): 2002 2021

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCBB(-1)	-0.260393	0.174711	-1.490421	0.1544
C	0.196505	0.127222	1.544578	0.1409
@TREND("2001")	-0.001327	0.001963	-0.675907	0.5082
R-squared	0.136148	Mean dependent var		-0.003790
Adjusted R-squared	0.034519	S.D. dependent var		0.051511
S.E. of regression	0.050614	Akaike info criterion		-2.991691
Sum squared resid	0.043550	Schwarz criterion		-2.842331
Log likelihood	32.91691	Hannan-Quinn criter.		-2.962534
F-statistic	1.339652	Durbin-Watson stat		1.515434
Prob(F-statistic)	0.288226			

LCBB@FIRST DIFF ADF

Null Hypothesis: D(LCBB) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.505304	0.0195
Test critical values:		
1% level	-3.831511	
5% level	-3.029970	
10% level	-2.655194	

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

Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LCBB,2)

Method: Least Squares

Date: 01/31/23 Time: 00:30

Sample (adjusted): 2003 2021

Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCBB(-1))	-0.840321	0.239728	-3.505304	0.0027
C	-0.003612	0.012351	-0.292399	0.7735
R-squared	0.419541	Mean dependent var		-0.000979

Adjusted R-squared	0.385396	S.D. dependent var	0.068547
S.E. of regression	0.053739	Akaike info criterion	-2.910061
Sum squared resid	0.049094	Schwarz criterion	-2.810646
Log likelihood	29.64558	Hannan-Quinn criter.	-2.893236
F-statistic	12.28716	Durbin-Watson stat	1.947719
Prob(F-statistic)	0.002713		

Null Hypothesis: D(LCBB) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.473477	0.0714
Test critical values: 1% level	-4.532598	
5% level	-3.673616	
10% level	-3.277364	

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

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LCBB,2)

Method: Least Squares

Date: 01/31/23 Time: 00:30

Sample (adjusted): 2003 2021

Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCBB(-1))	-0.859264	0.247379	-3.473477	0.0031
C	0.010135	0.028397	0.356911	0.7258
@TREND("2001")	-0.001255	0.002323	-0.540358	0.5964

R-squared	0.429944	Mean dependent var	-0.000979
Adjusted R-squared	0.358687	S.D. dependent var	0.068547
S.E. of regression	0.054894	Akaike info criterion	-2.822883
Sum squared resid	0.048214	Schwarz criterion	-2.673761
Log likelihood	29.81738	Hannan-Quinn criter.	-2.797645
F-statistic	6.033704	Durbin-Watson stat	1.951341
Prob(F-statistic)	0.011152		

LCBB@LEVEL PP

Null Hypothesis: LCBB has a unit root

Exogenous: Constant

Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-1.719898	0.4067
Test critical values:		
1% level	-3.808546	
5% level	-3.020686	
10% level	-2.650413	

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

Residual variance (no correction)	0.002236
HAC corrected variance (Bartlett kernel)	0.002798

Phillips-Perron Test Equation

Dependent Variable: D(LCBB)

Method: Least Squares

Date: 01/31/23 Time: 00:32

Sample (adjusted): 2002 2021

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCBB(-1)	-0.260457	0.172055	-1.513804	0.1474
C	0.182621	0.123644	1.476988	0.1570
R-squared	0.112934	Mean dependent var		-0.003790
Adjusted R-squared	0.063652	S.D. dependent var		0.051511
S.E. of regression	0.049845	Akaike info criterion		-3.065172
Sum squared resid	0.044721	Schwarz criterion		-2.965599
Log likelihood	32.65172	Hannan-Quinn criter.		-3.045735
F-statistic	2.291603	Durbin-Watson stat		1.476966
Prob(F-statistic)	0.147437			

Null Hypothesis: LCBB has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-1.490421	0.7985
Test critical values:		
1% level	-4.498307	
5% level	-3.658446	
10% level	-3.268973	

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

Residual variance (no correction)	0.002178
HAC corrected variance (Bartlett kernel)	0.002178

Phillips-Perron Test Equation
 Dependent Variable: D(LCBB)
 Method: Least Squares
 Date: 01/31/23 Time: 00:32
 Sample (adjusted): 2002 2021
 Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCBB(-1)	-0.260393	0.174711	-1.490421	0.1544
C	0.196505	0.127222	1.544578	0.1409
@TREND("2001")	-0.001327	0.001963	-0.675907	0.5082
R-squared	0.136148	Mean dependent var	-0.003790	
Adjusted R-squared	0.034519	S.D. dependent var	0.051511	
S.E. of regression	0.050614	Akaike info criterion	-2.991691	
Sum squared resid	0.043550	Schwarz criterion	-2.842331	
Log likelihood	32.91691	Hannan-Quinn criter.	-2.962534	
F-statistic	1.339652	Durbin-Watson stat	1.515434	
Prob(F-statistic)	0.288226			

LCBB@FIRST DIFF PP

Null Hypothesis: D(LCBB) has a unit root
 Exogenous: Constant
 Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.486568	0.0203
Test critical values:		
1% level	-3.831511	
5% level	-3.029970	
10% level	-2.655194	

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

Warning: Probabilities and critical values calculated for 20 observations
 and may not be accurate for a sample size of 19

Residual variance (no correction)	0.002584
HAC corrected variance (Bartlett kernel)	0.002460

Phillips-Perron Test Equation
 Dependent Variable: D(LCBB,2)
 Method: Least Squares

Date: 01/31/23 Time: 00:33
Sample (adjusted): 2003 2021
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCBB(-1))	-0.840321	0.239728	-3.505304	0.0027
C	-0.003612	0.012351	-0.292399	0.7735
R-squared	0.419541	Mean dependent var		-0.000979
Adjusted R-squared	0.385396	S.D. dependent var		0.068547
S.E. of regression	0.053739	Akaike info criterion		-2.910061
Sum squared resid	0.049094	Schwarz criterion		-2.810646
Log likelihood	29.64558	Hannan-Quinn criter.		-2.893236
F-statistic	12.28716	Durbin-Watson stat		1.947719
Prob(F-statistic)	0.002713			

Null Hypothesis: D(LCBB) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.445836	0.0749
Test critical values:		
1% level	-4.532598	
5% level	-3.673616	
10% level	-3.277364	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Residual variance (no correction)	0.002538
HAC corrected variance (Bartlett kernel)	0.002364

Phillips-Perron Test Equation
Dependent Variable: D(LCBB,2)
Method: Least Squares
Date: 01/31/23 Time: 00:33
Sample (adjusted): 2003 2021
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCBB(-1))	-0.859264	0.247379	-3.473477	0.0031
C	0.010135	0.028397	0.356911	0.7258
@TREND("2001")	-0.001255	0.002323	-0.540358	0.5964
R-squared	0.429944	Mean dependent var		-0.000979
Adjusted R-squared	0.358687	S.D. dependent var		0.068547
S.E. of regression	0.054894	Akaike info criterion		-2.822883
Sum squared resid	0.048214	Schwarz criterion		-2.673761

Log likelihood	29.81738	Hannan-Quinn criter.	-2.797645
F-statistic	6.033704	Durbin-Watson stat	1.951341
Prob(F-statistic)	0.011152		

LDCB@LEVEL ADF

Null Hypothesis: LDCB has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-12.81739	0.0000
Test critical values: 1% level	-3.808546	
5% level	-3.020686	
10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LDCB)

Method: Least Squares

Date: 01/31/23 Time: 00:49

Sample (adjusted): 2002 2021

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDCB(-1)	-0.351939	0.027458	-12.81739	0.0000
C	1.020146	0.070149	14.54256	0.0000
R-squared	0.901254	Mean dependent var		0.158194
Adjusted R-squared	0.895768	S.D. dependent var		0.276522
S.E. of regression	0.089275	Akaike info criterion		-1.899550
Sum squared resid	0.143461	Schwarz criterion		-1.799977
Log likelihood	20.99550	Hannan-Quinn criter.		-1.880112
F-statistic	164.2854	Durbin-Watson stat		0.782772
Prob(F-statistic)	0.000000			

Null Hypothesis: LDCB has a unit root
 Exogenous: Constant, Linear Trend
 Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-20.58852	0.0000
Test critical values:		
1% level	-4.498307	
5% level	-3.658446	
10% level	-3.268973	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(LDCB)
 Method: Least Squares
 Date: 01/31/23 Time: 00:50
 Sample (adjusted): 2002 2021
 Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDCB(-1)	-0.491678	0.023881	-20.58852	0.0000
C	1.133996	0.039097	29.00459	0.0000
@TREND("2001")	0.021752	0.003011	7.224133	0.0000
R-squared	0.975737	Mean dependent var		0.158194
Adjusted R-squared	0.972883	S.D. dependent var		0.276522
S.E. of regression	0.045536	Akaike info criterion		-3.203165
Sum squared resid	0.035249	Schwarz criterion		-3.053805
Log likelihood	35.03165	Hannan-Quinn criter.		-3.174009
F-statistic	341.8328	Durbin-Watson stat		2.641526
Prob(F-statistic)	0.000000			

LDCB@FIRST DIFF ADF

Null Hypothesis: D(LDCB) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.650890	0.0000
Test critical values:		
1% level	-3.831511	
5% level	-3.029970	
10% level	-2.655194	

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

Warning: Probabilities and critical values calculated for 20 observations
 and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(LDCB,2)
 Method: Least Squares
 Date: 01/31/23 Time: 00:50
 Sample (adjusted): 2003 2021
 Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDCB(-1))	-0.469745	0.061397	-7.650890	0.0000
C	0.021042	0.019675	1.069444	0.2998
R-squared	0.774942	Mean dependent var		-0.056031
Adjusted R-squared	0.761703	S.D. dependent var		0.150913
S.E. of regression	0.073669	Akaike info criterion		-2.279171
Sum squared resid	0.092261	Schwarz criterion		-2.179757
Log likelihood	23.65213	Hannan-Quinn criter.		-2.262346
F-statistic	58.53612	Durbin-Watson stat		2.876724
Prob(F-statistic)	0.000001			

Null Hypothesis: D(LDCB) has a unit root
 Exogenous: Constant, Linear Trend
 Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.793867	0.0009
Test critical values:		
1% level	-4.532598	
5% level	-3.673616	
10% level	-3.277364	

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

Warning: Probabilities and critical values calculated for 20 observations
 and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(LDCB,2)
 Method: Least Squares
 Date: 01/31/23 Time: 00:51
 Sample (adjusted): 2003 2021
 Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDCB(-1))	-0.468122	0.080796	-5.793867	0.0000
C	0.019331	0.056661	0.341170	0.7374
@TREND("2001")	0.000131	0.004061	0.032330	0.9746
R-squared	0.774957	Mean dependent var		-0.056031
Adjusted R-squared	0.746826	S.D. dependent var		0.150913
S.E. of regression	0.075934	Akaike info criterion		-2.173974
Sum squared resid	0.092255	Schwarz criterion		-2.024852
Log likelihood	23.65275	Hannan-Quinn criter.		-2.148736
F-statistic	27.54873	Durbin-Watson stat		2.879651

Prob(F-statistic) 0.000007

LDCB@LEVEL PP

Null Hypothesis: LDCB has a unit root

Exogenous: Constant

Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-9.511057	0.0000
Test critical values:		
1% level	-3.808546	
5% level	-3.020686	
10% level	-2.650413	

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

Residual variance (no correction)	0.007173
HAC corrected variance (Bartlett kernel)	0.013498

Phillips-Perron Test Equation

Dependent Variable: D(LDCB)

Method: Least Squares

Date: 01/31/23 Time: 00:53

Sample (adjusted): 2002 2021

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDCB(-1)	-0.351939	0.027458	-12.81739	0.0000
C	1.020146	0.070149	14.54256	0.0000
R-squared	0.901254	Mean dependent var		0.158194
Adjusted R-squared	0.895768	S.D. dependent var		0.276522
S.E. of regression	0.089275	Akaike info criterion		-1.899550
Sum squared resid	0.143461	Schwarz criterion		-1.799977
Log likelihood	20.99550	Hannan-Quinn criter.		-1.880112
F-statistic	164.2854	Durbin-Watson stat		0.782772
Prob(F-statistic)	0.000000			

Null Hypothesis: LDCB has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 19 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-78.92246	0.0000
Test critical values:		
1% level	-4.498307	
5% level	-3.658446	

10% level -3.268973

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

Residual variance (no correction)	0.001762
HAC corrected variance (Bartlett kernel)	0.000118

Phillips-Perron Test Equation
 Dependent Variable: D(LDCB)
 Method: Least Squares
 Date: 01/31/23 Time: 00:53
 Sample (adjusted): 2002 2021
 Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDCB(-1)	-0.491678	0.023881	-20.58852	0.0000
C	1.133996	0.039097	29.00459	0.0000
@TREND("2001")	0.021752	0.003011	7.224133	0.0000
R-squared	0.975737	Mean dependent var		0.158194
Adjusted R-squared	0.972883	S.D. dependent var		0.276522
S.E. of regression	0.045536	Akaike info criterion		-3.203165
Sum squared resid	0.035249	Schwarz criterion		-3.053805
Log likelihood	35.03165	Hannan-Quinn criter.		-3.174009
F-statistic	341.8328	Durbin-Watson stat		2.641526
Prob(F-statistic)	0.000000			

LDCB@FIRST DIFF PP

Null Hypothesis: D(LDCB) has a unit root
 Exogenous: Constant
 Bandwidth: 10 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-24.94797	0.0000
Test critical values:		
1% level	-3.831511	
5% level	-3.029970	
10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.
 Warning: Probabilities and critical values calculated for 20 observations
 and may not be accurate for a sample size of 19

Residual variance (no correction)	0.004856
HAC corrected variance (Bartlett kernel)	0.000398

Phillips-Perron Test Equation
 Dependent Variable: D(LDCB,2)
 Method: Least Squares
 Date: 01/31/23 Time: 00:53
 Sample (adjusted): 2003 2021
 Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDCB(-1))	-0.469745	0.061397	-7.650890	0.0000
C	0.021042	0.019675	1.069444	0.2998
R-squared	0.774942	Mean dependent var		-0.056031
Adjusted R-squared	0.761703	S.D. dependent var		0.150913
S.E. of regression	0.073669	Akaike info criterion		-2.279171
Sum squared resid	0.092261	Schwarz criterion		-2.179757
Log likelihood	23.65213	Hannan-Quinn criter.		-2.262346
F-statistic	58.53612	Durbin-Watson stat		2.876724
Prob(F-statistic)	0.000001			

Null Hypothesis: D(LDCB) has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 10 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-18.15843	0.0001
Test critical values:		
1% level	-4.532598	
5% level	-3.673616	
10% level	-3.277364	

*MacKinnon (1996) one-sided p-values.
 Warning: Probabilities and critical values calculated for 20 observations
 and may not be accurate for a sample size of 19

Residual variance (no correction)	0.004856
HAC corrected variance (Bartlett kernel)	0.000390

Phillips-Perron Test Equation
 Dependent Variable: D(LDCB,2)
 Method: Least Squares
 Date: 01/31/23 Time: 00:54
 Sample (adjusted): 2003 2021
 Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDCB(-1))	-0.468122	0.080796	-5.793867	0.0000
C	0.019331	0.056661	0.341170	0.7374
@TREND("2001")	0.000131	0.004061	0.032330	0.9746
R-squared	0.774957	Mean dependent var		-0.056031

Adjusted R-squared	0.746826	S.D. dependent var	0.150913
S.E. of regression	0.075934	Akaike info criterion	-2.173974
Sum squared resid	0.092255	Schwarz criterion	-2.024852
Log likelihood	23.65275	Hannan-Quinn criter.	-2.148736
F-statistic	27.54873	Durbin-Watson stat	2.879651
Prob(F-statistic)	0.000007		

LRGDP@LEVEL ADF

Null Hypothesis: LRGDP has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.719159	0.0017
Test critical values:		
1% level	-3.857386	
5% level	-3.040391	
10% level	-2.660551	

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

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 18

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LRGDP)

Method: Least Squares

Date: 01/31/23 Time: 00:56

Sample (adjusted): 2004 2021

Included observations: 18 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LRGDP(-1)	-8.865307	1.878578	-4.719159	0.0003
D(LRGDP(-1))	8.176933	1.744779	4.686515	0.0004
D(LRGDP(-2))	8.414206	1.803718	4.664924	0.0004
C	7.378785	1.497707	4.926722	0.0002

R-squared	0.615624	Mean dependent var	0.598786
Adjusted R-squared	0.533257	S.D. dependent var	2.700352
S.E. of regression	1.844842	Akaike info criterion	4.255794
Sum squared resid	47.64819	Schwarz criterion	4.453655
Log likelihood	-34.30215	Hannan-Quinn criter.	4.283077
F-statistic	7.474211	Durbin-Watson stat	2.402308
Prob(F-statistic)	0.003172		

Null Hypothesis: LRGDP has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 3 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic	-5.225219	0.0034
Test critical values:	1% level	-4.616209
	5% level	-3.710482
	10% level	-3.297799

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

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 17

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LRGDP)

Method: Least Squares

Date: 01/31/23 Time: 00:57

Sample (adjusted): 2005 2021

Included observations: 17 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LRGDP(-1)	-19.25417	3.684854	-5.225219	0.0003
D(LRGDP(-1))	18.09426	3.497214	5.173908	0.0003
D(LRGDP(-2))	18.37922	3.522990	5.216938	0.0003
D(LRGDP(-3))	7.907123	3.221503	2.454482	0.0320
C	20.16116	4.269268	4.722393	0.0006
@TREND("2001")	-0.404084	0.146098	-2.765841	0.0184
R-squared	0.797261	Mean dependent var		0.628124
Adjusted R-squared	0.705106	S.D. dependent var		2.780501
S.E. of regression	1.509926	Akaike info criterion		3.932563
Sum squared resid	25.07865	Schwarz criterion		4.226638
Log likelihood	-27.42679	Hannan-Quinn criter.		3.961795
F-statistic	8.651371	Durbin-Watson stat		2.150251
Prob(F-statistic)	0.001532			

LRGDP@FIRST DIFF ADF

Null Hypothesis: D(LRGDP) has a unit root

Exogenous: Constant

Lag Length: 4 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.026670	0.0088
Test critical values:	1% level	-3.959148
	5% level	-3.081002
	10% level	-2.681330

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

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 15

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LRGDP,2)

Method: Least Squares

Date: 01/31/23 Time: 00:58

Sample (adjusted): 2007 2021

Included observations: 15 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LRGDP(-1))	-30.68097	7.619441	-4.026670	0.0030
D(LRGDP(-1),2)	28.95858	7.407887	3.909155	0.0036
D(LRGDP(-2),2)	28.94900	7.321201	3.954132	0.0033
D(LRGDP(-3),2)	19.38434	6.962651	2.784046	0.0213
D(LRGDP(-4),2)	6.431066	3.731781	1.723324	0.1189
C	-0.571975	0.627848	-0.911009	0.3860
R-squared	0.856195	Mean dependent var		0.002330
Adjusted R-squared	0.776303	S.D. dependent var		4.249336
S.E. of regression	2.009791	Akaike info criterion		4.523113
Sum squared resid	36.35332	Schwarz criterion		4.806333
Log likelihood	-27.92334	Hannan-Quinn criter.		4.520096
F-statistic	10.71695	Durbin-Watson stat		2.120233
Prob(F-statistic)	0.001391			

Null Hypothesis: D(LRGDP) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 4 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.595800	0.0652
Test critical values:		
1% level	-4.728363	
5% level	-3.759743	
10% level	-3.324976	

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

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 15

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LRGDP,2)

Method: Least Squares

Date: 01/31/23 Time: 00:58

Sample (adjusted): 2007 2021

Included observations: 15 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LRGDP(-1))	-29.01635	8.069513	-3.595800	0.0070
D(LRGDP(-1),2)	27.23655	7.881096	3.455934	0.0086
D(LRGDP(-2),2)	27.09656	7.844287	3.454305	0.0086
D(LRGDP(-3),2)	19.01197	7.131163	2.666040	0.0285
D(LRGDP(-4),2)	6.029487	3.847729	1.567025	0.1557
C	-2.123578	2.075823	-1.023005	0.3362
@TREND("2001")	0.135712	0.172672	0.785951	0.4545

R-squared	0.866503	Mean dependent var	0.002330
Adjusted R-squared	0.766380	S.D. dependent var	4.249336
S.E. of regression	2.053884	Akaike info criterion	4.582067
Sum squared resid	33.74752	Schwarz criterion	4.912490
Log likelihood	-27.36550	Hannan-Quinn criter.	4.578547
F-statistic	8.654405	Durbin-Watson stat	2.094050
Prob(F-statistic)	0.003803		

LRGDP@LEVEL PP

Null Hypothesis: LRGDP has a unit root

Exogenous: Constant

Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.946244	0.0527
Test critical values:		
1% level	-3.808546	
5% level	-3.020686	
10% level	-2.650413	

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

Residual variance (no correction)	6.170678
HAC corrected variance (Bartlett kernel)	6.170678

Phillips-Perron Test Equation

Dependent Variable: D(LRGDP)

Method: Least Squares

Date: 01/31/23 Time: 00:59

Sample (adjusted): 2002 2021

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LRGDP(-1)	-0.079157	0.177385	-0.446244	0.6607
C	0.684854	0.665586	1.028950	0.3171

R-squared	0.010942	Mean dependent var	0.543606
Adjusted R-squared	-0.044006	S.D. dependent var	2.562676
S.E. of regression	2.618455	Akaike info criterion	4.857686
Sum squared resid	123.4136	Schwarz criterion	4.957259
Log likelihood	-46.57686	Hannan-Quinn criter.	4.877124
F-statistic	0.199134	Durbin-Watson stat	1.898691
Prob(F-statistic)	0.660743		

Null Hypothesis: LRGDP has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

Adj. t-Stat	Prob.*

Phillips-Perron test statistic	-1.191461	0.8846
Test critical values:	1% level	-4.498307
	5% level	-3.658446
	10% level	-3.268973

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

Residual variance (no correction)	5.279602
HAC corrected variance (Bartlett kernel)	5.279602

Phillips-Perron Test Equation
 Dependent Variable: D(LRGDP)
 Method: Least Squares
 Date: 01/31/23 Time: 00:59
 Sample (adjusted): 2002 2021
 Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LRGDP(-1)	-0.226189	0.189842	-1.191461	0.2498
C	-0.985551	1.172096	-0.840845	0.4121
@TREND("2001")	0.184073	0.108670	1.693875	0.1085
R-squared	0.153767	Mean dependent var		0.543606
Adjusted R-squared	0.054210	S.D. dependent var		2.562676
S.E. of regression	2.492247	Akaike info criterion		4.801728
Sum squared resid	105.5920	Schwarz criterion		4.951088
Log likelihood	-45.01728	Hannan-Quinn criter.		4.830884
F-statistic	1.544513	Durbin-Watson stat		1.920300
Prob(F-statistic)	0.241917			

LRGDP@FIRST DIFF PP

Null Hypothesis: D(LRGDP) has a unit root
 Exogenous: Constant
 Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-4.190765	0.0047
Test critical values:	1% level	-3.831511
	5% level	-3.029970
	10% level	-2.655194

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

Warning: Probabilities and critical values calculated for 20 observations
 and may not be accurate for a sample size of 19

Residual variance (no correction)	6.564374
HAC corrected variance (Bartlett kernel)	6.551057

Phillips-Perron Test Equation
 Dependent Variable: D(LRGDP,2)
 Method: Least Squares
 Date: 01/31/23 Time: 01:01
 Sample (adjusted): 2003 2021
 Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LRGDP(-1))	-1.017454	0.242775	-4.190938	0.0006
C	0.560440	0.636716	0.880204	0.3910
R-squared	0.508158	Mean dependent var	-0.021304	
Adjusted R-squared	0.479226	S.D. dependent var	3.753397	
S.E. of regression	2.708626	Akaike info criterion	4.930061	
Sum squared resid	124.7231	Schwarz criterion	5.029475	
Log likelihood	-44.83558	Hannan-Quinn criter.	4.946885	
F-statistic	17.56396	Durbin-Watson stat	1.995508	
Prob(F-statistic)	0.000614			

Null Hypothesis: D(LRGDP) has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-4.823046	0.0057
Test critical values:		
1% level	-4.532598	
5% level	-3.673616	
10% level	-3.277364	

*MacKinnon (1996) one-sided p-values.
 Warning: Probabilities and critical values calculated for 20 observations
 and may not be accurate for a sample size of 19

Residual variance (no correction)	5.844720
HAC corrected variance (Bartlett kernel)	3.064868

Phillips-Perron Test Equation
 Dependent Variable: D(LRGDP,2)
 Method: Least Squares
 Date: 01/31/23 Time: 01:02
 Sample (adjusted): 2003 2021
 Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LRGDP(-1))	-1.134040	0.250314	-4.530461	0.0003
C	-1.178937	1.385362	-0.850996	0.4073
@TREND("2001")	0.164185	0.116975	1.403589	0.1796

R-squared	0.562079	Mean dependent var	-0.021304
Adjusted R-squared	0.507339	S.D. dependent var	3.753397
S.E. of regression	2.634503	Akaike info criterion	4.919205
Sum squared resid	111.0497	Schwarz criterion	5.068327
Log likelihood	-43.73245	Hannan-Quinn criter.	4.944443
F-statistic	10.26813	Durbin-Watson stat	2.029669
Prob(F-statistic)	0.001353		

DESCRIPTIVE STATISTIC

	LAGRCDT	LBCB	LCBB	LDCB	LRGDP
Mean	8.785788	1.461817	0.711710	2.483186	2.253922
Median	9.051531	1.481769	0.709874	2.702717	0.818960
Maximum	10.58613	1.550404	0.816951	3.163879	11.65139
Minimum	5.630275	1.337990	0.577362	0.000000	-0.093726
Std. Dev.	1.114721	0.056036	0.067320	0.743563	3.940102
Skewness	-0.855322	-0.773277	-0.054442	-2.118149	2.014529
Kurtosis	4.241346	2.733550	2.178764	7.287808	5.111021
Jarque-Bera	3.908835	2.154971	0.600499	31.79007	18.10350
Probability	0.141647	0.340450	0.740633	0.000000	0.000117
Sum	184.5016	30.69816	14.94592	52.14692	47.33236
Sum Sq. Dev.	24.85206	0.062801	0.090641	11.05771	310.4881
Observations	21	21	21	21	21

CORRELATION COEFFICIENT MATRIX

	LRGDP	LAGRCDT	LBCB	LCBB	LDCB
LRGDP	1.000000	-0.651219	0.347173	-0.557353	0.174330
LAGRCDT	-0.651219	1.000000	-0.096529	0.535867	0.177589
LBCB	0.347173	-0.096529	1.000000	-0.311683	-0.101784
LCBB	-0.557353	0.535867	-0.311683	1.000000	0.340951
LDCB	0.174330	0.177589	-0.101784	0.340951	1.000000

SHORT RUN ARDL

Dependent Variable: LR GDP

Method: ARDL

Date: 02/16/23 Time: 15:19

Sample (adjusted): 2003 2021

Included observations: 19 after adjustments

Maximum dependent lags: 2 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (2 lags, automatic): LAGRCDT BCB CBB DCB

Fixed regressors: C

Number of models evaluated: 162

Selected Model: ARDL(1, 1, 2, 1, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LR GDP(-1)	1.081194	0.228255	4.736783	0.0021
LAGRCDT	-0.959333	1.597230	-0.600623	0.5670
LAGRCDT(-1)	12.67107	2.471176	5.127546	0.0014
BCB	8.55E+09	3.82E+09	2.239315	0.0601
BCB(-1)	5.37E+09	4.43E+09	1.212559	0.2646
BCB(-2)	-7.52E+09	5.41E+09	-1.390231	0.2071
CBB	2.92E+10	1.76E+10	1.659743	0.1409
CBB(-1)	-1.63E+10	1.73E+10	-0.938851	0.3791
DCB	1.20E+08	2.16E+08	0.556125	0.5954
DCB(-1)	-4.26E+08	2.20E+08	-1.937897	0.0938
DCB(-2)	2.33E+08	1.59E+08	1.462229	0.1871
C	-2.37E+11	3.23E+11	-0.734488	0.4865
R-squared	0.986014	Mean dependent var		6.95E+10
Adjusted R-squared	0.964037	S.D. dependent var		1.65E+11
S.E. of regression	3.13E+10	Akaike info criterion		51.43571
Sum squared resid	6.85E+21	Schwarz criterion		52.03220
Log likelihood	-476.6392	Hannan-Quinn criter.		51.53666
F-statistic	44.86529	Durbin-Watson stat		2.311242
Prob(F-statistic)	0.000020			

*Note: p-values and any subsequent tests do not account for model selection.

ARDL ERROR CORRECTION MODEL

ARDL Error Correction Regression

Dependent Variable: D(RGDP)

Selected Model: ARDL(1, 1, 2, 1, 2)

Case 3: Unrestricted Constant and No Trend

Date: 02/16/23 Time: 15:22

Sample: 2001 2021

Included observations: 19

ECM Regression				
Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.37E+11	3.20E+10	0.000000	0.0000
D(LAGRCDT)	-0.959333	0.894723	-1.072213	0.3192
D(BCB)	8.55E+09	2.10E+09	0.000000	0.0000
D(BCB(-1))	7.52E+09	2.24E+09	0.000000	0.0000
D(CBB)	2.92E+10	1.13E+10	0.000000	0.0000
D(DCB)	1.20E+08	1.14E+08	0.000000	0.0000
D(DCB(-1))	-2.33E+08	99401462	0.000000	0.0000
CointEq(-1)*	-0.081194	0.008774	9.253396	0.0000
R-squared	0.964099	Mean dependent var	2.32E+10	
Adjusted R-squared	0.941252	S.D. dependent var	1.03E+11	
S.E. of regression	2.50E+10	Akaike info criterion	51.01466	
Sum squared resid	6.85E+21	Schwarz criterion	51.41232	
Log likelihood	-476.6392	Hannan-Quinn criter.	51.08196	
F-statistic	42.19940	Durbin-Watson stat	2.311242	
Prob(F-statistic)	0.000000			

* p-value incompatible with t-Bounds distribution.

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	10.89777	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

t-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	9.253396	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6

ARDL LONG RUN FORM AND BOUND TEST

ARDL Long Run Form and Bounds Test

Dependent Variable: D(RGDP)

Selected Model: ARDL(1, 1, 2, 1, 2)

Case 3: Unrestricted Constant and No Trend

Date: 02/16/23 Time: 15:31

Sample: 2001 2021

Included observations: 19

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.37E+11	3.23E+11	0.000000	0.0000
LRGDP(-1)*	0.081194	0.228255	0.355714	0.7325
LAGRCDT(-1)	11.71174	3.595270	3.257541	0.0139
BCB(-1)	6.39E+09	8.54E+09	0.000000	0.0000
CBB(-1)	1.30E+10	1.64E+10	0.000000	0.0000
DCB(-1)	-72832571	62789566	0.000000	0.0000
D(AGRCDT)	-0.959333	1.597230	-0.600623	0.5670
D(BCB)	8.55E+09	3.82E+09	0.000000	0.0000
D(BCB(-1))	7.52E+09	5.41E+09	0.000000	0.0000
D(CBB)	2.92E+10	1.76E+10	0.000000	0.0000
D(DCB)	1.20E+08	2.16E+08	0.000000	0.0000
D(DCB(-1))	-2.33E+08	1.59E+08	0.000000	0.0000

* p-value incompatible with t-Bounds distribution.

Levels Equation				
Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LAGRCDT	-144.2447	375.0648	-0.384586	0.7120
BCB	-7.87E+10	2.21E+11	-0.356469	0.7320
CBB	-1.60E+11	3.56E+11	-0.448630	0.6673
DCB	8.97E+08	2.04E+09	0.440633	0.6728

EC = RGDP - (-144.2447*AGRCDT -78729922361.0145*BCB
-159553815248.8676*CBB + 897024479.4014*DCB)

F-Bounds Test Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	10.89777	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06
Finite Sample: n=35				
Actual Sample Size	19			

10%	2.696	3.898
5%	3.276	4.63
1%	4.59	6.368

Finite Sample:
n=30

10%	2.752	3.994
5%	3.354	4.774
1%	4.768	6.67

t-Bounds Test

Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	0.355714	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6

GRANGER CAUSALITY TEST

Pairwise Granger Causality Tests

Date: 01/31/23 Time: 01:15

Sample: 2001 2021

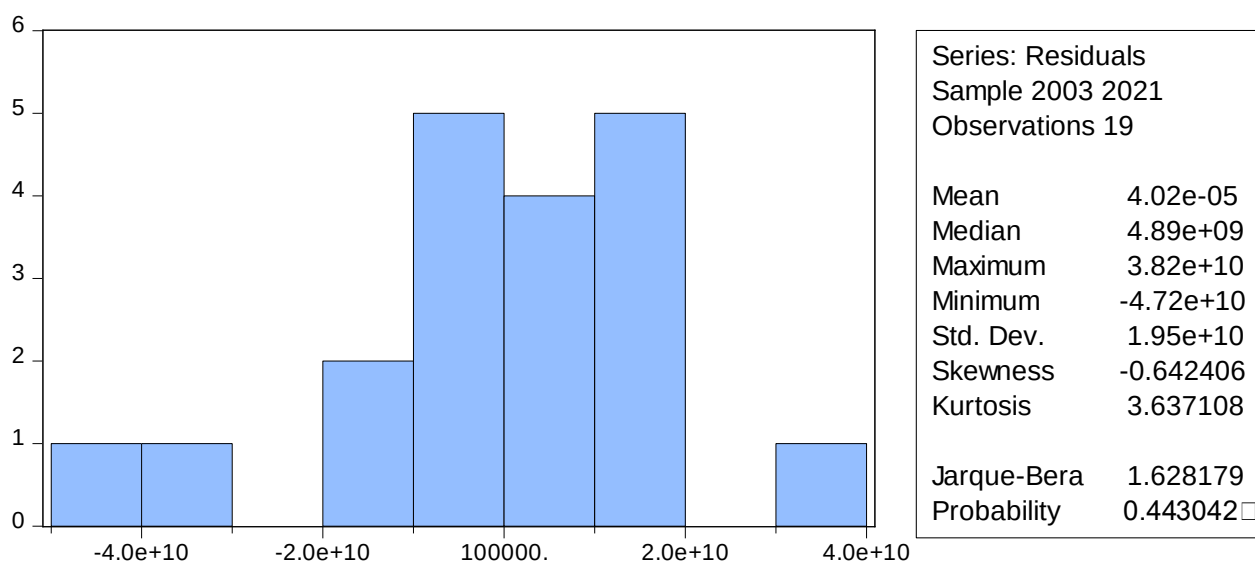
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LBCB does not Granger Cause LAGRCDT	19	2.55019	0.1137
LAGRCDT does not Granger Cause LBCB		6.19364	0.0118
LCBB does not Granger Cause LAGRCDT	19	0.67333	0.5258
LAGRCDT does not Granger Cause LCBB		0.03569	0.9650
LDCB does not Granger Cause LAGRCDT	19	0.67470	0.5251
LAGRCDT does not Granger Cause LDCB		0.83797	0.4532
LRGDP does not Granger Cause LAGRCDT	19	10.0439	0.0020
LAGRCDT does not Granger Cause LRGDP		1.68678	0.2206
LCBB does not Granger Cause LBCB	19	0.00966	0.9904
LBCB does not Granger Cause LCBB		0.04094	0.9600
LDCB does not Granger Cause LBCB	19	0.29210	0.7511
LBCB does not Granger Cause LDCB		1.18927	0.3334
LRGDP does not Granger Cause LBCB	19	2.68178	0.1033
LBCB does not Granger Cause LRGDP		5.42369	0.0180
LDCB does not Granger Cause LCBB	19	0.21482	0.8093
LCBB does not Granger Cause LDCB		0.03622	0.9645
LRGDP does not Granger Cause LCBB	19	0.28596	0.7556

LCBB does not Granger Cause LRGDP		1.72447	0.2140
LRGDP does not Granger Cause LDCB	19	0.33327	0.7221
LDCB does not Granger Cause LRGDP		0.77310	0.4803

POST ESTIMATION TEST

NORMALITY TEST



LM_SERIAL CORRELATION TEST

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.411930	Prob. F(2,5)	0.6830
Obs*R-squared	2.687797	Prob. Chi-Square(2)	0.2608

Test Equation:

Dependent Variable: RESID

Method: ARDL

Date: 02/16/23 Time: 15:34

Sample: 2003 2021

Included observations: 19

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LRGDP(-1)	-0.037424	0.293424	-0.127543	0.9035
LAGRCDT	-1.197758	3.250266	-0.368511	0.7276
LAGRCDT(-1)	-0.828731	2.878282	-0.287926	0.7850
BCB	1.45E+09	4.50E+09	0.322506	0.7601
BCB(-1)	-2.19E+09	9.24E+09	-0.236982	0.8221
BCB(-2)	-1.70E+09	6.45E+09	-0.263402	0.8028
CBB	-4.39E+09	2.29E+10	-0.191518	0.8557
CBB(-1)	-5.79E+09	2.02E+10	-0.286771	0.7858
DCB	-1.16E+08	2.69E+08	-0.432176	0.6836
DCB(-1)	62405683	2.82E+08	0.221524	0.8334
DCB(-2)	69378537	2.22E+08	0.312780	0.7671
C	1.40E+11	4.35E+11	0.322275	0.7603
RESID(-1)	-0.629168	0.895647	-0.702473	0.5137
RESID(-2)	-0.427422	1.016272	-0.420579	0.6915
R-squared	0.141463	Mean dependent var		4.02E-05
Adjusted R-squared	-2.090733	S.D. dependent var		1.95E+10
S.E. of regression	3.43E+10	Akaike info criterion		51.49371
Sum squared resid	5.88E+21	Schwarz criterion		52.18961
Log likelihood	-475.1903	Hannan-Quinn criter.		51.61149
F-statistic	0.063374	Durbin-Watson stat		2.177928
Prob(F-statistic)	0.999960			

HETROSKEDASTICITY TEST

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.149331	Prob. F(11,7)	0.4422
Obs*R-squared	12.22902	Prob. Chi-Square(11)	0.3467
Scaled explained SS	2.188660	Prob. Chi-Square(11)	0.9977

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 02/16/23 Time: 15:35

Sample: 2003 2021

Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.84E+21	5.95E+21	1.317264	0.2292
LRGDP(-1)	-8.67E+09	4.20E+09	-2.062975	0.0780
LAGRCDT	-5.19E+10	2.94E+10	-1.765768	0.1208
LAGRCDT(-1)	-7.20E+10	4.55E+10	-1.581849	0.1577
BCB	-6.04E+19	7.03E+19	-0.860216	0.4182
BCB(-1)	3.71E+19	8.15E+19	0.455596	0.6625
BCB(-2)	-1.45E+20	9.96E+19	-1.454129	0.1892
CBB	-5.32E+20	3.24E+20	-1.641044	0.1448
CBB(-1)	-3.95E+19	3.19E+20	-0.123761	0.9050

DCB	-1.21E+17	3.97E+18	-0.030571	0.9765
DCB(-1)	3.97E+18	4.04E+18	0.982155	0.3587
DCB(-2)	-1.60E+18	2.93E+18	-0.544372	0.6031
R-squared	0.643632	Mean dependent var	3.61E+20	
Adjusted R-squared	0.083626	S.D. dependent var	6.02E+20	
S.E. of regression	5.76E+20	Akaike info criterion	98.70828	
Sum squared resid	2.32E+42	Schwarz criterion	99.30476	
Log likelihood	-925.7286	Hannan-Quinn criter.	98.80922	
F-statistic	1.149331	Durbin-Watson stat	2.404376	
Prob(F-statistic)	0.442193			

RAMSEY RESET TEST

Ramsey RESET Test

Equation: UNTITLED

Specification: LRGDP LRGDP(-1) LRGDP(-2) DCB DCB(-1) DCB(-2)

LAGRCDT LAGRCDT(-1) CBB C

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.892834	5	0.4129
F-statistic	0.797152	(1, 5)	0.4129

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	2.475743	1	2.475743
Restricted SSR	2.495473	5	0.499095
Unrestricted SSR	0.019730	4	0.004932

Unrestricted Test Equation:

Dependent Variable: LRGDP

Method: ARDL

Date: 02/16/23 Time: 16:02

Sample: 2005 2021

Included observations: 17

Maximum dependent lags: 2 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (2 lag, automatic):

Fixed regressors: C

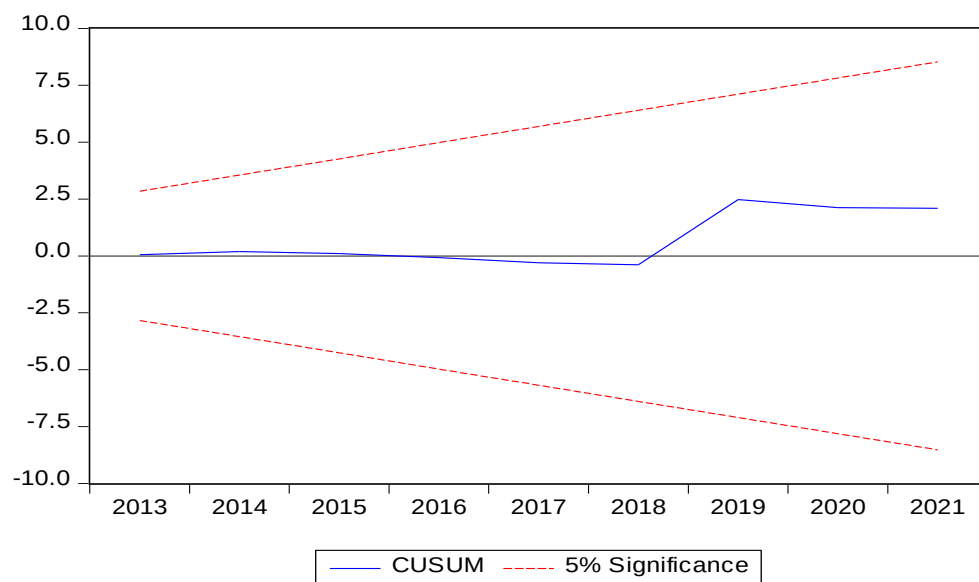
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LRGDP(-1)	0.068238	0.061405	1.111278	0.3287
LRGDP(-2)	-0.009601	0.025898	-0.370734	0.7296
LRGDP(-3)	0.808802	0.313095	2.583253	0.0611
LRGDP(-4)	1.425636	0.419614	3.397490	0.0273
LAGRCDT	0.531437	0.221103	2.403573	0.0741
LAGRCDT(-1)	-0.128497	0.133148	-0.965071	0.3892
BCB	0.018556	0.010000	1.855596	0.1371
BCB(-1)	-0.008864	0.013750	-0.644696	0.5542
CBB	0.205842	0.031985	6.435587	0.0030

DCB	-0.002300	0.000601	-3.829774	0.0186
DCB(-1)	0.000965	0.000543	1.778775	0.1499
C	-5.700878	2.955871	-1.928663	0.1260
FITTED^2	0.103793	0.004633	22.40369	0.0000
R-squared	0.999935	Mean dependent var	2.561317	
Adjusted R-squared	0.999739	S.D. dependent var	4.344252	
S.E. of regression	0.070232	Akaike info criterion	-2.391540	
Sum squared resid	0.019730	Schwarz criterion	-1.754377	
Log likelihood	33.32809	Hannan-Quinn criter.	-2.328205	
F-statistic	5101.215	Durbin-Watson stat	2.004947	
Prob(F-statistic)	0.000000			

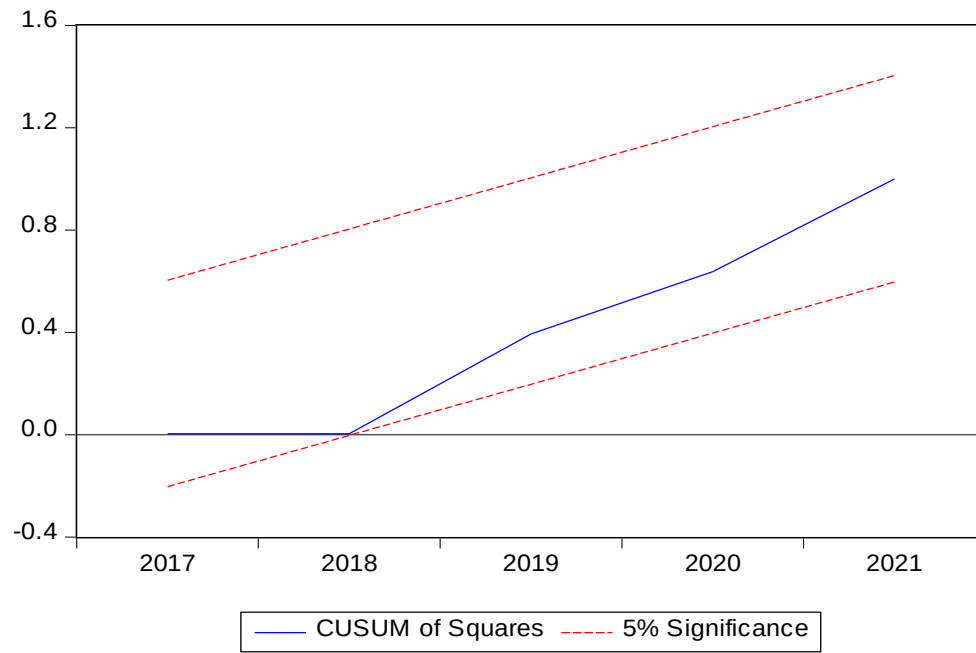
*Note: p-values and any subsequent tests do not account for model selection.

Stability Test

CUSUM TEST



CUSUM SQUARE TEST



Appendix B: Useful Resources

REAF= Research Ethics Application Form



REAF_DSPA - Version 1.0 AP

UNICAF UNIVERSITY RESEARCH ETHICS APPLICATION FORM DOCTORAL STUDIES PROVISIONAL APPROVAL

The Provisional Approval - Research Ethics Application Form (REAF) should be completed by Doctoral level candidates enrolled on Dissertation stage 1.

This form is a **provisional approval** which means that the UREC committee has accepted the initial description of the project but this is conditional as changes may have to be implemented following Dissertation Stage 2 and piloting in Dissertation Stage 3.

This is a conditional offer and acceptance of the project needs to be verified and confirmed upon completion of the Research Ethics Application Form in Dissertation Stage 3.

Important Notes:

- An electronic version of the completed form should be uploaded by the student to the relevant submission link in the VLE. Student's supervisor will then review the form and provide feedback commentary. Once supervisor's initial approval is given then the supervisor will forward this to doctoral.studies-aa@unicaf.org, for provisional approval by the Unicaf University Research Ethics Committee (UREC).
- Please type your answers and **do not** submit paper copy scans. Only *PDF* format documents should be submitted to the committee. It is recommended to use free version of Adobe Acrobat Reader available online: <https://get.adobe.com/reader/>
- If you need to supply any supplementary material, not specifically requested by the application form, please do so in a separate file. Any additional document(s) should be clearly labelled and uploaded in the relevant VLE link.
- If you have any queries about the form, please address them to your dissertation or project supervisor.



REAF_DSPA - Version 1.0



UNICAF UNIVERSITY
RESEARCH ETHICS APPLICATION FORM
DOCTORAL STUDIES PROVISIONAL APPROVAL

UREC USE ONLY:

Application No:

Date Received:

Student's Name: Auta Bulus Jamaka**Student's E-mail Address:** a.bulus@boanig.com**Student's ID #:** R1808D5946482**Supervisor's Name:** Dr. Olajide Solomun Fadun**University Campus:** Unicaf University Zambia (UUZ)**Program of Study:** UUZ: DBA Doctoral of Business Administration**Research Project Title:** Financial Inclusion, Agricultural Credit and Economic Growth:
Empirical Evidence from Bank of Agriculture.**1. Please state the timelines involved in the proposed research project:**

Estimated Start Date: 21-Mar-2021

Estimated End Date: 31-Aug-2021

2. The research project**2a. Project Summary:**

In this section please fully describe the purpose and underlying rationale for the proposed research project. Ensure that you pose the research questions to be examined, state the hypotheses, and discuss the expected results of your research and their potential.

It is important in your description to use plain language so it can be understood by all members of the UREC, especially those who are not necessarily experts in the particular discipline. To that effect please ensure that you fully explain / define any technical terms or discipline-specific terminology (maximum 300 words +/- 10%).

The aim of this study is to evaluate the impact of operations of Bank of Agriculture (BOA) on the agricultural sector, financial inclusion and the Nigerian economy, as a whole.

Although a number of studies have examined the relationship between financial inclusion, growth in the agriculture sector and the economy, none of them exerted their search lights on effect of the operations of the bank, on the economy. Knowing that access to funding has continually been mentioned as a major challenge to increasing agricultural production, the incitement to carry out this research became more urgent and compelling. Four decades after its establishment as the country's apex agriculture-focused Development Finance Institution (DFI), it would be helpful to want to know how the bank has fared. The study will give better insights into how to reposition the institution for better accomplishments. It is also important for the management and owners of the Bank to want to start yet another debate like the one Hans Dieter Seibel initiated in 2000, when he posed the question "State Agriculture Development Banks (Ag.DBx); ignore, close or reform them".

To address the research problems, the following research questions shall be addressed.

How does financial inclusion impact on Economic Growth in Nigeria?

Agricultural credits does not have impact on economic growth in Nigeria through Bank of Agriculture .

Financial inclusion and agricultural credit does not have any long-run effect on economic growth in Nigeria?

2b. Significance of the Proposed Research Study and Potential Benefits:

Outline the potential significance and/or benefits of the research (maximum 200 words).

This study will contribute to the volume of existing literature on the impact of financial inclusion and agricultural credit on Nigeria economic growth. The study will serve as a guide to those who would like to carry out further research in this area. Surely, poverty, misery and related concerns have assumed a frightening dimension, and a research of this consequence on financial inclusion (FI), will help inform the Management of the Bank to re-strategize in solving many challenges facing it. With over 40% of the country's citizens said to be financially excluded from formal financial services, it should interest Governments and CBN to want to find out the best way to reform the Bank, to help in the fight against hunger by the year 2030. This subject is of utmost concern to Nigeria, as it is to the rest of the world, to find a lasting solution to the growing global conflicts and unrest, resulting from poor livelihood in rural communities. Also, of relevance to policy makers in formulating policies that will improve the financial system Nigeria given emphasis to financial inclusion of small farmers in the rural areas which will provide employment to the teeming population, reduce poverty and achieve very high economic growth.

3. Project execution:

3a. Type of project. The following study is an:

- ☐ experimental study (primary research)
- ☒ desktop study (secondary research)
- ☐ desktop study using existing databases involving information of human/animal subjects
- ☐ Other

If you have chosen 'Other' please Explain:

Secondary Research (Desktop study).

This study will make use of secondary data on Gross Domestic Product (GDP), Agricultural credits, financial inclusion; from websites, bulletins and publications by World Bank, Central Bank of Nigeria (CBN), Nigerian Bureau of Statistics (NBS), BOA and other related studies. A major part of the Financial Inclusion reforms in the Nigerian economy started in the year 2012. As such, the study shall cover equal number of years of priority sector lending and inclusive growth during and post the period; data from 2011 to 2020 shall be used.

3b. Methods. The following study will involve the use of:

Method	Materials / Tools
☐ Qualitative	☐ Face to Face Interviews ☐ Phone Interviews ☐ Face to Face Focus Groups ☐ Online Focus Groups ☐ Other*
☐ Quantitative	☐ Self-administered Questionnaires ☐ Online Questionnaires ☐ Experiments ☒ Tests ☐ Other *

*If you have chosen 'Other' please Explain:

Additional explanation on TESTS.

Time series data on GDP (as proxy for economic growth), Agricultural sector contribution as a % of GDP (Proxy for growth of the agricultural sector), Agricultural Credit and Financial inclusion (Access and Usage), shall first and foremost be tested for collinearity using Unit Root Test, Analysis will be by Autoregressive analysis

4. Participants**4a. Does the Project involve the recruitment of participants?**

- ☐ YES **If YES, please complete all following sections.**
- ☒ NO **If NO, please directly proceed to [Question 5](#).**

Note: The definition of "participation" includes active participation, such as when participants knowingly take part in an interview or complete a questionnaire.



4b. Relevant Participant Details of the Proposed Research

Please state the number of participants you plan to recruit, and describe important characteristics such as: demographics (e.g. age, gender, location, affiliation, level of fitness, intellectual ability etc). It is also important that you specify any inclusion and exclusion criteria that will be applied (e.g. eligibility criteria for participants).

Number of participants

Age range From To

Gender ☐ Female
☐ Male

Eligibility Criteria:

- Inclusion criteria

- Exclusion criteria

Disabilities

Other relevant information (maximum 100 words):

4c. Recruitment Process for Human Research Participants:

Please clearly describe how the potential participants will be identified, approached and recruited (maximum 200 words).

4d. Relationship between the principal investigator and participants:

Is there any relationship between the principal investigator (student), co-investigators(s), (supervisor) and participant(s)? For example, if you are conducting research in a school environment on students in your classroom (e.g. instructor-student).

☐

YES

☒

NO

If YES, please specify (maximum 100 words).

5. Further Approvals

Are there any other approvals required (in addition to ethics clearance from UREC) in order to carry out the proposed research study?

☐

YES

☒

NO

If YES, please specify (maximum 100 words).

6. Potential Risks of the Proposed Research Study

Are there any potential risks, psychological harm and/or ethical issues associated with the proposed research study, other than risks pertaining to everyday life events (such as the risk of an accident when travelling to a remote location for data collection)?

☐ YES ☒ NO

If YES, please specify (maximum 150 words):

7. Application Checklist

Please mark ☒ if the study involves any of the following:

- ☐ Children and young people under 18 years of age, vulnerable population such as children with special educational needs (SEN), racial or ethnic minorities, socioeconomically disadvantaged, pregnant women, elderly, malnourished people, and ill people.
- ☐ Research that foresees risks and disadvantages that would affect any participant of the study such as anxiety, stress, pain or physical discomfort, harm risk (which is more than is expected from everyday life) or any other act that participants might believe is detrimental to their wellbeing and / or has the potential to / will infringe on their human rights / fundamental rights.
- ☐ Risk to the well-being and personal safety of the researcher.
- ☐ Administration of any substance (food / drink / chemicals / pharmaceuticals / supplements / chemical agent or vaccines or other substances (including vitamins or food substances) to human participants.
- ☐ Results that may have an adverse impact on the natural or built environment.



8. Final Declaration by Applicants:

- (a) I declare that this application is submitted on the basis that the information it contains is confidential and will only be used by Unicaf University and Unicaf University Research Ethics Committee (UREC) for the explicit purpose of ethical review and monitoring of the conduct of the research proposed project as described in the preceding pages.
- (b) I understand that this information will not be used for any other purpose without my prior consent, excluding use intended to satisfy reporting requirements to relevant regulatory bodies.
- (c) The information in this form, together with any accompanying information, is complete and correct to the best of my knowledge and belief and I take full responsibility for it.
- (d) I undertake to abide by the highest possible international ethical standards governing the Code of Practice for Research Involving Human Participants, as published by the UN WHO Research Ethics Review Committee (ERC) on <http://www.who.int/ethics/research/en/> and to which Unicaf University aspires to.
- (e) In addition to respect any and all relevant professional bodies' codes of conduct and/or ethical guidelines, where applicable, while in pursuit of this research project.
- (f) I understand it is my responsibility to submit a full REAF application during Dissertation Stage 3 to UREC. If a REAF application is not submitted my project is not approved by UREC.
- (g) I fully acknowledge that this form does not constitute approval of the proposed project but it is only a provisional approval.

☒ I agree with all points listed under Question 8

Student's Name:

Supervisor's Name:

Date of Application: 21-Feb-2021

Important Note:

Please now save your completed form (we suggest you also print a copy for your records) and then submit it to your UU Dissertation/project supervisor (tutor). **In the case of student projects, the responsibility lies with the Faculty Dissertation/Project Supervisor.** If this is a student application, then it should be submitted via the relevant link in the VLE. Please submit only electronically filled in copies; **do not** hand fill and submit scanned paper copies of this application.

☒ Before submitting your application, please tick this box to confirm that all relevant sections have been filled in and the information contained is accurate to the best of your knowledge.

GL = Gatekeeper's Letter

To; UREC
From: Auta Bulus Jamaka
Subject: 1. Informed Consent Form / Guardian Informed Consent Form and
 2. Gatekeeper Letter

It has become necessary to inform this most respected Committee (UREC), on the fact that the two documents mentioned above do not apply to the study in question because all necessary data are readily available in the Public domain and are captured, collated, and made available to anybody, anytime they desire to access them. The detail is as stated below: -

- (a) For this study the data required are (1) Nigeria's economic growth trend as measured by Gross Domestic Product; (2) the Volume of agricultural loans and advances (Credit) granted to the private sector by Banks, and (3) financial inclusion, defined by the number of bank branches, the volume of deposits taken by banks and the number of borrowers mentioned by banks in their books. These statistics are regular information kept by all banks, who are, required to render such accounts to the Central Bank of Nigeria periodically, failing which sanctions are applied on defaulting financial institutions. By their nature, the information is collated and stored by CBN as primary data. This information now serves as secondary data for the purpose of this research work, in line with the recommendations of Hox and Boeijs, (2005). They are kept in official data archives and made available to the interested public.
- (b) The materials in these archives are stored electronically and maintained on websites that describe the data and their coordinate sources. For this study, the data catalogs on the variables mentioned above were identified from the World Development Index (WDI), Central Bank of Nigeria (CBN), Nigerian Bureau of Statistics (NBS), and Bank of Agriculture (BOA). The

catalogs harbor comprehensive information on the mentioned variables and many others, as well as the subjects that provided the information. These four institutions currently rung high amongst those organizations in Nigeria that have been identified as reliable partners for making this kind of information freely available to users on (1) the internet or as (2) books and (3) publications/journals. Through their respective websites, records of data on both dependent and independent variables, information were accessed. Similar studies conducted by Olaniyi, 2017; Marshal, Onyinye, Ifechi & Charles, 2016), and many other scholars used the same or similar sources.

(c) The data are freely available on the internet and were located using the information gateways provided in table 1 below. The use of general search engines such as Google also gave us some insight to help compare data from different sources. The sources of data include: -

Name	Website/Internet address	Type of data
WDI	World Bank open data via https://data.worldbank.org .	World Bank Statistical Bulletin; GDP at 2010 Constant Basic Prices and Agricultural credit
CBN	Central Bank of Nigeria (CBN); https://www.cbn.gov.ng	CBN periodic Statistical Bulletin; quarterly, annual, etc.
NBS	Nigeria Bureau of Statistics; www.nigeriastat.gov.ng	Quarterly, and yearly statistics on a wide range of social and economic indices in Nigeria

Thank you.

Auta Bulus Jamaka
R1808D59464

LOCAL/NATIONAL RESEARCH ETHIC APPROVAL: APPROVAL OF BANK OF
AGRICULTURE (BOA) LOAN DISBURSEMENT DATA FROM 2001-2021



BANK OF AGRICULTURE LIMITED
1, Yakubu Gowon Way
PMB 2155
Kaduna, Nigeria.

T +234 (0) 704 020 2222
+234 (0) 704 226 2222
E info@boanig.com
W www.boanig.com

March 14, 2024

Autu Bulus Jamaka
37, Nyerere Road,
Chikun Local Govt. Area,
Kaduna.

Dear Sir,

**APPROVAL OF BANK OF AGRICULTURE LOAN DISBURSEMENT DATA FROM
YEAR 2001 TO 2021**

We refer to your letter of 13th February 2024 and forward herewith a copy of BOA loan Situation Report for the period 2001 to 2021 to be used solely for research purpose in your project titled "Financial Inclusion, Agricultural Credit & Economic Growth: Empirical evidence from Bank of Agriculture, Nigeria".

Note that for any purpose other than your project here mentioned, Bank of Agriculture wish to dissociate itself thencefrom.

Thank you.

For: Bank of Agriculture Limited


Folorunso I. T
DH, Risk Mgt. & Control


Olatomide D.A
DH, Finance & Strategy

ALWAN ALI HASSAN (Ag. Managing Director/CEO)

RC. 10874

GICF = Guardian Informed Consent Form



UU_IC - Version 2.1



Informed Consent Form

Part 1: Debriefing of Participants

Student's Name:

Student's E-mail Address:

Student ID #:

Supervisor's Name:

University Campus: Choose from the list

Program of Study:

Research Project Title:

Date:

Provide a short description (purpose, aim and significance) of the research project, and explain why and how you have chosen this person to participate in this research (maximum 150 words).

The above named Student is committed in ensuring participant's voluntarily participation in the research project and guaranteeing there are no potential risks and/or harms to the participants.

Participants have the right to withdraw at any stage (prior or post the completion) of the research without any consequences and without providing any explanation. In these cases, data collected will be deleted.

All data and information collected will be coded and will not be accessible to anyone outside this research. Data described and included in dissemination activities will only refer to coded information ensuring beyond the bounds of possibility participant identification.

I, , ensure that all information stated above is true and that all conditions have been met.

Student's Signature: _____



Informed Consent Form

Part 2: Certificate of Consent

This section is mandatory and should to be signed by the participant(s)

Student's Name:

Student's E-mail Address:

Student ID #:

Supervisor's Name:

University Campus: Choose from the list

Program of Study:

Research Project Title:

I have read the foregoing information about this study, or it has been read to me. I have had the opportunity to ask questions and discuss about it. I have received satisfactory answers to all my questions and I have received enough information about this study. I understand that I am free to withdraw from this study at any time without giving a reason for withdrawing and without negative consequences. I consent to the use of multimedia (e.g. audio recordings, video recordings) for the purposes of my participation to this study. I understand that my data will remain anonymous and confidential, unless stated otherwise. I consent voluntarily to be a participant in this study.

Participant's Print name:

Participant's Signature:

Date:

If the Participant is illiterate:

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had an opportunity to ask questions. I confirm that the aforementioned individual has given consent freely.

Witness's Print name:

Witness's Signature:

Date:



Unicaf University Research Ethics Committee Decision

Student's Name: Jamaka Bulus Auta

Student's ID #: R1808D5946482

Supervisor's Name: Dr Solomon Olajide Fadun

Program of Study: UUZ: DBA Doctoral of Business Administration

Offer ID /Group ID: O37435G39042

Dissertation Stage: 3

Research Project Title: Financial inclusion, Agricultural credit and Economic growth: Empirical evidence from Bank of Agriculture (BOA) Limited, Nigeria.

Comments: No comments

Decision*: A. Approved without revision or comments

Date: 07-Nov-2022

*Provisional approval provided at the Dissertation Stage 1, whereas the final approval is provided at the Dissertation stage 3. The student is allowed to proceed to data collection following the final approval.