Financial Inclusion and Economic Growth in Nigeria

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BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF FINANCE, FACULTY OF MANAGEMENT SCIENCES, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF BACHELOR OF SCIENCE (B.Sc.) IN BANKING AND FINANCE, UNIVERSITY OF BENIN, BENIN CITY, NIGERIA.

NOVEMBER, 2025.

DECLARATION

I**, Excellence Efosa EBHOMIEN** declare that,

i. This study is based on a study undertaken by me in the Department of Finance, Faculty of Management Sciences, University of Benin, Benin City, under the supervision of Dr Omorokunwa of the Department of Finance Management Sciences, University of Benin, Benin City, Nigeria.

ii. This work has not been submitted for the award of degree elsewhere.

iii. Ideas and views are product of my personal research and where the view of others has been expressed, they have been duly acknowledged.

iv. Any liability arising from this work is to be wholly borne by me alone

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CERTIFICATE

We the undersigned, certify that this project was carried out by **Excellence Efosa EBHOMIEN** With Matriculation Number **MGS2104732** of the Department of Finance, University of Benin, Benin City. It is adequate in scope and quality for the partial fulfillment of the requirements of the award of Bachelor of Science in Banking and Finance.

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DEDICATION

To My Dear Lord, Jesus Christ, my helper, who has Made this a Reality. For his mercies and grace seeing me through all my academic session and up to this final lap of my undergraduate program.

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ABSTRACT

This study investigates the relationship between financial inclusion and economic growth in Nigeria, emphasizing the role of accessible financial services in promoting investment, employment, and income equality. Using secondary data from the Central Bank of Nigeria, the National Bureau of Statistics, and the World Bank from 2000 to 2023, the study analyzes indicators such as the number of bank branches, mobile money usage, savings rate, and credit to the private sector in relation to Gross Domestic Product (GDP) growth. The findings reveal a strong positive link between financial inclusion and economic growth, showing that greater access to financial services stimulates productive activities and enhances economic performance. However, factors such as poor financial literacy, infrastructural deficits, and limited rural access still constrain the full benefits of inclusion. The study recommends policies that promote digital finance, improve financial literacy, and expand financial infrastructure to achieve sustainable economic growth in Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Financial inclusion has emerged as a central theme in development discourse due to its critical role in fostering economic growth, reducing poverty, and enhancing social equity. It is broadly understood as the process of ensuring access to appropriate financial products and services at affordable costs for all individuals, especially the underserved and low-income populations. According to the World Bank (2022), financial inclusion enables individuals and businesses to access useful and affordable financial services—transactions, payments, savings, credit, and insurance—in a responsible and sustainable manner.

Despite the potential of financial inclusion to drive inclusive economic development, significant gaps remain, especially in developing countries like Nigeria. The 2021 Global Findex Database reveals that while financial inclusion is improving globally, about 1.4 billion adults remain unbanked, with sub-Saharan Africa accounting for a considerable share (Demirgüç-Kunt et al., 2022). In Nigeria, although progress has been made through mobile money and agency banking, a large segment of the population remains excluded from formal financial systems (Central Bank of Nigeria [CBN], 2020).

The implications of financial exclusion are profound. Individuals without access to financial services are denied opportunities to save securely, obtain credit, or invest in their businesses or education. This exclusion undermines efforts to reduce poverty, enhance productivity, and

promote economic equity. Conversely, financial inclusion enhances economic participation, encourages savings, improves credit access, and supports entrepreneurial activity, thereby contributing to broader macroeconomic stability and sustainable development (Ozili, 2021).

Financial inclusion initiatives in Nigeria, as reflected in the revised National Financial Inclusion Strategy (NFIS) of 2018, seek to address systemic barriers by leveraging technology and expanding financial service delivery channels. Innovations such as agent banking, mobile banking, and biometric identification systems have significantly enhanced financial access, particularly in rural and underserved communities (CBN, 2020). These interventions not only expand the reach of financial institutions but also ensure a more secure and inclusive banking experience.

In addition, the financial sector plays a vital role in facilitating economic development by mobilizing savings, allocating capital efficiently, and supporting investment and innovation. The inclusive financial system strengthens the resilience of households, businesses, and entire economies by providing risk management tools and enabling more stable consumption and investment patterns (UNSGSA, 2020). Hence, improving access to financial services is not just a social imperative but a strategic economic priority.

As global and national stakeholders intensify efforts to deepen financial inclusion, continuous monitoring, evaluation, and policy refinement remain essential. Financial inclusion, when effectively implemented, can bridge economic gaps, promote inclusive prosperity, and lay the foundation for a resilient and equitable economy.

1.2 Statement of the Problem

In recent years, Nigeria has made notable strides in expanding its financial sector, with a range of initiatives aimed at enhancing financial inclusion and stimulating economic growth. Despite this progress, there remains a considerable gap in understanding the precise contribution of various financial inclusion channels to the country's overall economic performance. One key area of concern is the extent to which the number of bank branches affects economic growth. While physical banking infrastructure has expanded, it is unclear whether the presence of more bank branches translates into increased productivity, investment, and sustainable economic development, or whether other structural factors limit their impact.

Similarly, the proliferation of automated teller machines (ATMs) across urban and rural areas has improved access to cash and basic banking services. However, the relationship between ATM availability and economic growth remains insufficiently examined. Questions persist as to whether increased ATM coverage directly stimulates economic activity or whether its benefits are concentrated among already financially active segments of the population.

The rapid rise of point of sale (POS) transactions in Nigeria has also transformed payment systems by enabling easier, faster, and more secure transactions. Yet, there is limited empirical evidence on whether the growing use of POS technology significantly contributes to economic growth or merely reflects existing consumption patterns without necessarily expanding the productive capacity of the economy.

Access to credit is widely acknowledged as a vital driver of entrepreneurship, investment, and economic expansion. Nevertheless, the actual effect of credit availability on Nigeria's economic growth remains debatable. While credit can empower individuals and businesses, issues such as high interest rates, repayment risks, and unequal access may limit its capacity to drive inclusive economic development.

Mobile banking has emerged as one of the most dynamic tools for promoting financial inclusion, offering convenience and accessibility to millions of Nigerians, especially in underserved areas. However, despite its popularity, the extent to which mobile banking directly influences economic growth remains inadequately explored, raising questions about its role as a genuine economic growth driver versus a mere facilitator of financial transactions.

Beyond these individual financial inclusion indicators, a broader unresolved issue is the direction of causation between financial inclusion and economic growth. While it is generally assumed that expanding access to financial services boosts economic performance, it is equally plausible that economic growth itself creates the conditions for greater financial inclusion. This ambiguity presents a critical knowledge gap, as policymakers and stakeholders require clear empirical evidence to determine whether financial inclusion should be treated as a primary driver of growth or as an outcome of broader economic advancement.

1.3 Objectives of The Study

To investigate and analyze the intricate link between financial inclusion and economic growth in Nigeria, with a focus on understanding how increased access to financial services impacts the country's economic development and progress. The specific objectives are:

1. ascertain the extent to which number of bank branches affect economic growth in Nigeria

2. examine the relationship between numbers of automated teller machine (ATM) and economic growth in Nigeria.

3. investigate the effect of point of sale (POS) transaction on economic growth in Nigeria

4. determine the effect of access to credit on economic growth in Nigeria

5. ascertain the extent to which mobile banking influences economic growth in Nigeria

6. determine the direction of causation between financial inclusion and economic growth in Nigeria

1.4 Research Questions

1. To what extent does the number of bank branches affect economic growth in Nigeria?

2. What is the relationship between the number of automated teller machines (ATMs) and economic growth in Nigeria?

3. How does point of sale (POS) transaction volume affect economic growth in Nigeria?

4. What is the effect of access to credit on economic growth in Nigeria?

5. To what extent does mobile banking influence economic growth in Nigeria?

6. What is the direction of causation between financial inclusion and economic growth in Nigeria?

1.5 Hypothesis of the Study

1. H_0: The number of bank branches has no significant effect on economic growth in Nigeria.

2. H_0: There is no significant relationship between the number of automated teller machines (ATMs) and economic growth in Nigeria.

3. H_0: Point of sale (POS) transactions have no significant effect on economic growth in Nigeria.

4. H_0: Access to credit has no significant effect on economic growth in Nigeria.

5. H_0: Mobile banking has no significant influence on economic growth in Nigeria.

6. H_0: There is no directional causation between financial inclusion and economic growth in Nigeria.

1.6 Significance of the Study

This study is designed to equip policymakers, financial institutions, and development agencies with crucial knowledge on enhancing financial inclusion to drive economic growth that benefits everyone. By investigating the relationship between financial inclusion and economic growth, this research offers practical guidance for stakeholders. The findings will enable policymakers to develop informed policies that increase financial access and promote inclusion. Financial institutions will gain valuable insights into creating products and services tailored to underserved populations. Development agencies will benefit from evidence-based approaches to support financial inclusion initiatives. This research advances our understanding of the role financial systems play in economic development and growth. It adds depth and nuance to existing academic literature on financial inclusion and economic growth. The study's results will help bridge the knowledge gap on leveraging financial inclusion for sustainable economic

development. By highlighting best practices and challenges, this research will inform the development of more effective financial inclusion strategies. Ultimately, this study aims to foster a more inclusive and equitable financial system that promotes economic growth and development. The insights gained from this research will be invaluable for policymakers seeking to create a more financially inclusive economy. Financial institutions will be better positioned to design and deliver financial products and services that meet the needs of diverse populations. Development agencies will have access to actionable intelligence to inform their financial inclusion initiatives. This study contributes to the growing body of research on financial inclusion and economic development. It provides a comprehensive understanding of the complex relationships between financial inclusion, economic growth, and development. The research will shed light on the ways in which financial inclusion can be harnessed to promote economic growth and reduce poverty. By exploring the intersection of financial inclusion and economic growth, this study offers a unique perspective on the topic. The findings will have significant implications for policymakers, financial institutions, and development agencies seeking to promote financial inclusion. This research will help stakeholders develop more effective strategies for promoting financial inclusion and driving economic growth. Overall, this study aims to make a meaningful contribution to our understanding of financial inclusion and economic development.

1.7 Scope of the Study

This research explores Nigeria's financial inclusion policies and economic indicators from 1990 to 2024, providing an analysis of the country's progress. The study investigates the accessibility of essential financial services, including savings, credit, and digital payments. It assesses the reach and penetration of these services across urban and rural areas, highlighting disparities and opportunities for growth. By examining the trends and patterns in financial inclusion, the study offers insights into the effectiveness of policies and initiatives. The research aims to deepen understanding of the relationship between financial inclusion and economic growth in Nigeria. The study's findings will inform policymakers and stakeholders on designing more effective financial inclusion strategies. Ultimately, the research contributes to promoting financial inclusion and driving economic development in Nigeria.

1.8 Limitations of the Study

This study uses data from 1990 to 2024, which may lead to some problems. Over the years, changes in how data was collected can cause inconsistencies in the results. Also, older data may not fully reflect the current state of financial inclusion, especially with recent advances in digital banking. Because the time span is long, it can be difficult to analyze trends clearly without confusion. These challenges can affect how accurate and relevant the findings are. To reduce these issues, the study considers major policy or economic changes when analyzing the results.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The connection between financial inclusion and economic growth is explored through a review of existing studies. Research in this area is analyzed to understand the underlying concepts and theories. Empirical evidence is also examined to identify patterns and correlations. By synthesizing the findings, this chapter provides insight into the role of financial inclusion in promoting economic growth. A comprehensive analysis of the literature sheds light on the complex relationship between these two variables.

2.2 Concept of Financial Inclusion

Financial inclusion refers to the process of ensuring that individuals and businesses have access to affordable, timely, and adequate financial products and services that meet their needs, such as savings, payments, credit, and insurance, delivered in a responsible and sustainable manner (Demirgüç-Kunt et al., 2018). The concept has evolved from being merely about providing access to formal banking services to encompassing the quality, usage, and impact of such services on improving welfare and promoting inclusive economic growth. In the context of Nigeria, financial inclusion is a critical developmental goal aimed at reducing poverty, fostering entrepreneurship, and integrating the informal sector into the formal economy (Central Bank of Nigeria [CBN], 2020).

The importance of financial inclusion lies in its ability to bridge the gap between the unbanked population and the formal financial system. By enabling individuals to save securely, obtain credit, and conduct transactions efficiently, financial inclusion enhances economic participation and reduces inequality (World Bank, 2022). In developing economies like Nigeria, where a large

proportion of the population resides in rural areas and survives through informal economic activities, the availability of inclusive financial services is central to achieving the Sustainable Development Goals (SDGs), particularly those relating to poverty reduction and decent work (United Nations, 2021).

Financial inclusion is often measured by indicators such as the number of bank branches, automated teller machines (ATMs) per 100,000 adults, mobile banking penetration, point-of-sale (POS) transaction volumes, and the share of adults with formal financial accounts (Global Findex, 2021). These indicators help policymakers assess both physical access to financial services and the extent to which individuals are actively using them. In Nigeria, the National Financial Inclusion Strategy (NFIS), first introduced in 2012 and revised in 2018, set specific targets for expanding access to financial services, particularly through technology-driven channels like mobile money and agent banking (CBN, 2018).

Technological innovation plays a significant role in advancing financial inclusion. The growth of mobile money, internet banking, and fintech platforms has reduced dependency on traditional bank branches, thus reaching underserved populations in remote areas (Ozili, 2020). The COVID-19 pandemic further accelerated digital adoption in Nigeria, highlighting the importance of non-physical financial services for economic resilience (Efobi et al., 2021). However, while digital solutions have expanded access, issues such as poor internet connectivity, low financial literacy, cyber-security threats, and inadequate consumer protection remain barriers to full inclusion (Okoye & Eze, 2021).

From a policy perspective, financial inclusion is not only a social imperative but also an economic growth strategy. Empirical studies in Nigeria and other developing economies have shown that inclusive financial systems increase aggregate investment, support small and medium-sized enterprises (SMEs), and stimulate household consumption (Adeleke & Yusuf, 2023). This creates a multiplier effect that drives GDP growth, reduces unemployment, and fosters economic stability.

2.3 Concept of Economic Growth

Economic growth refers to the sustained increase in the productive capacity of an economy, reflected in the rise of real gross domestic product (GDP) over time (World Bank, 2022). It signifies an improvement in the quantity and quality of goods and services produced in a country and is often considered a key indicator of economic performance and societal welfare. Beyond mere expansion in output, economic growth encompasses structural changes in the economy, technological progress, and improvements in human capital that enable sustained productivity gains (Barro & Sala-i-Martin, 2020).

Traditionally, economic growth is measured by the percentage change in real GDP, which adjusts for inflation to reflect actual increases in output. However, modern perspectives emphasize that growth should also be evaluated based on inclusivity, sustainability, and its ability to improve living standards (OECD, 2021). This broader view aligns with the Sustainable Development Goals (SDGs), which link economic growth to social equity, environmental sustainability, and poverty reduction (United Nations, 2021).

In the Nigerian context, economic growth is particularly vital due to the country's demographic structure, abundant natural resources, and developmental aspirations. Nigeria's Vision 2050 underscores the importance of sustained growth to achieve industrialization, job creation, and poverty eradication (Federal Government of Nigeria, 2020). However, growth in Nigeria has historically been volatile, driven largely by the oil sector, which makes the economy vulnerable to fluctuations in global commodity prices (Akinlo & Lawal, 2022). Recent economic diversification policies aim to reduce this dependence by promoting agriculture, manufacturing, and services, with financial inclusion identified as a critical enabler of broad-based growth (CBN, 2020).

Economic growth theories highlight several determinants, including capital accumulation, technological innovation, institutional quality, and human capital development (Solow, 1956; Romer, 1990). In developing economies like Nigeria, access to finance plays a pivotal role by enabling investments in businesses, infrastructure, and education, thereby stimulating productive activities. Financial inclusion, in particular, is regarded as a channel through which households and small businesses can access resources for consumption smoothing, entrepreneurship, and asset accumulation, ultimately contributing to GDP growth (Adeleke & Yusuf, 2023).

There is a strong empirical link between economic growth and financial sector development. Countries with deeper and more inclusive financial systems tend to experience higher and more stable growth rates (Beck, Demirgüç-Kunt, & Levine, 2018). In Nigeria, the expansion of digital banking, point-of-sale transactions, and mobile payment systems has improved financial access,

potentially enhancing capital mobilization and investment (Okoye & Eze, 2021). However, the extent to which these translate into measurable economic growth depends on complementary factors such as infrastructure development, macroeconomic stability, and governance quality.

While economic growth is generally desirable, it is not without challenges. Growth that is not inclusive may widen income inequality, and growth driven by unsustainable exploitation of natural resources can harm long-term welfare (Stiglitz, 2018). Thus, for Nigeria, the focus is increasingly on promoting inclusive and sustainable economic growth, which balances the need for higher output with equity, environmental conservation, and resilience to shocks.

2.4 Theoretical Framework

2.4.1 Supply-Leading Hypothesis

The Supply-Leading Hypothesis suggests that the development and expansion of financial infrastructure precede and drive economic growth. It argues that the creation of new financial institutions, bank branches, ATMs, POS terminals, and mobile banking platforms provides the necessary channels for mobilizing savings and allocating capital to productive sectors of the economy (Nyasha & Odhiambo, 2019). By increasing access points, such as additional bank branches and ATMs, individuals and businesses can more easily deposit savings, obtain loans, and conduct transactions. This increased accessibility reduces the cost of financial intermediation and stimulates investment in productive ventures. In Nigeria, the spread of financial service points into rural and peri-urban areas has expanded the participation of micro, small, and medium enterprises in the economy (Okoye, 2021).

The hypothesis maintains that financial deepening can lead to improved resource allocation by directing funds toward their most productive uses. This effect is amplified when technological innovations such as mobile banking and POS transactions are integrated into the system, enabling real-time transfers and payments (Oluwafemi & Ogunrinola, 2023). By expanding financial services, the economy experiences enhanced liquidity, greater efficiency in payments, and increased capital formation. Empirical studies on Nigeria have shown that regions with more bank branches and ATMs experience higher GDP growth rates compared to underserved areas (Adeleke, 2022). This theory is particularly relevant in the Nigerian context, where infrastructure gaps remain a challenge, and strategic placement of financial outlets can bridge economic divides.

Furthermore, the hypothesis implies that policymakers can deliberately stimulate growth by investing in financial infrastructure, even before substantial demand exists. For example, the Central Bank of Nigeria's cashless policy, which promoted POS and mobile transactions, was partly supply-led, aiming to modernize payments and encourage broader usage. The supply-leading effect also benefits from economies of scale once infrastructure is in place, more people can be served without proportional increases in cost. This encourages private investment and boosts entrepreneurial activity. By linking financial inclusion directly to capital access, the supply-leading hypothesis underscores the catalytic role of banks and fintech in driving economic progress. Critics argue, however, that supply-leading effects can be weak if complementary factors like literacy and internet access are missing. Nevertheless, evidence from

Nigeria¬s expanding fintech ecosystem suggests that well-designed supply-leading strategies can stimulate both short-term economic activity and long-term growth potential (Abubakar & Ahmad, 2022).

2.4.2 Demand-Following Hypothesis

The Demand-Following Hypothesis presents an alternative perspective, arguing that economic growth generates demand for financial services rather than the other way around. According to this view, as an economy grows, incomes rise, businesses expand, and individuals seek more sophisticated financial products, prompting banks and fintech firms to increase their presence and offerings (Chirwa & Odhiambo, 2020). The increase in GDP leads to greater savings and investment needs, which in turn encourage the establishment of more bank branches, ATMs, and digital transaction channels. In Nigeria, urban centers experiencing rapid growth often witness higher concentrations of POS devices and mobile banking adoption compared to less developed regions.

The hypothesis suggests that financial institutions are more likely to invest in infrastructure in areas where economic activity is already robust. For instance, regions with higher trade volumes and industrial activity tend to attract more bank branches and ATM installations. This demand-driven expansion is evident in Nigeria¬s commercial hubs like Lagos, Port Harcourt, and Abuja, where economic dynamism has spurred intense competition among financial service providers. In addition, the surge in mobile banking usage during periods of increased business activity, such as festive seasons or oil price booms, reflects a demand-pull effect.

Empirical studies show that the financial sector tends to follow patterns of economic development, with growth in manufacturing, trade, and services creating new financial needs (Adeleke, 2022). For instance, increased export activity may lead to higher demand for trade finance services, while a growing middle class may drive the need for mortgage products and investment accounts. The Nigerian experience also highlights how policy changes such as currency redesign or cash withdrawal limits can temporarily spike demand for certain financial services. The demand-following hypothesis warns against over-investment in financial infrastructure in low-demand areas, as this may lead to underutilization and inefficiency. Nevertheless, when aligned with growth trends, financial expansion can be both profitable and sustainable.

It also implies that economic diversification efforts in Nigeria could indirectly boost financial inclusion by creating new industries and employment opportunities that necessitate financial intermediation. In sum, the demand-following hypothesis complements the supply-leading view by acknowledging that financial development often responds to, rather than initiates, economic growth (Nyasha & Odhiambo, 2019).

2.4.3. Finance→Growth Nexus Theory

The Finance→Growth Nexus Theory integrates the supply-leading and demand-following hypotheses, proposing that the relationship between financial development and economic growth is bidirectional. According to this theory, financial development stimulates economic growth by

improving the mobilization of savings, facilitating investments, and enhancing payment systems. Simultaneously, economic growth generates higher demand for financial services, creating a reinforcing cycle (Abubakar & Ahmad, 2022). In Nigeria, mobile banking, POS transactions, and expanded ATM networks have not only increased financial access but have also grown in response to rising business activity.

This theory suggests that causality can run in both directions depending on the stage of economic development. In early stages, financial expansion may be supply-led, while in more mature economies, growth may drive further financial innovation. Recent Nigerian studies confirm this bidirectional relationship, showing that mobile money penetration positively impacts GDP growth, and GDP growth in turn encourages more adoption of financial technologies (Udeh et al., 2024). The finance→growth nexus also underscores the importance of policy coordination between financial regulators and economic planners.

From a policy standpoint, the theory recommends balanced investment in both financial infrastructure and growth-promoting sectors. For example, expanding rural bank branches should be accompanied by agricultural productivity programs to generate demand for credit. Similarly, supporting SMEs with access to affordable loans can create both economic growth and increased demand for more financial services. The theory also accounts for the role of financial innovation in sustaining growth cycles↑digital lending platforms, for instance, can both stimulate entrepreneurship and expand market size for financial institutions.

It is particularly relevant to Nigeria, where different regions exhibit varying stages of the finance→growth cycle. Urban centers often show strong demand-pull effects, while rural areas may require supply-push interventions to kickstart growth. By recognizing these dynamics, the finance→growth nexus theory offers a nuanced framework for evaluating the impact of financial inclusion variables such as bank branches, ATMs, POS, credit access, and mobile banking. Ultimately, this theory highlights that sustainable economic development depends on the continuous interaction between financial expansion and economic performance, with each reinforcing the other over time.

2.5 Empirical Review

Agya, Ojiya, Ameh, and Ushie (2022) conducted a time-series study spanning 1985→2020 to evaluate how supply-side outreach and usage measures of financial inclusion affect Nigeria→s real GDP. Their empirical specification included bank branches per 100,000 adults, ATM density, private-sector credit, deposit volumes, and real GDP as the dependent variable. The authors implemented the Autoregressive Distributed Lag (ARDL) bounds test and estimated an Error Correction Model (ECM) to capture short-run dynamics and long-run equilibrium relationships. Results showed robust long-run positive coefficients for rural branch activity and private-sector credit, signalling these channels as key conduits for inclusion-driven growth. Short-run coefficients were smaller and less consistent, with ATM density and deposit mobilization showing supportive but weaker effects. The ECM coefficient indicated a reasonably fast adjustment back to long-run equilibrium, with most disequilibria correcting within one year.

Based on their empirical evidence, the authors argued for policies that emphasize rural outreach and credit expansion to harness inclusion→s growth potential. They concluded that sustainable economic gains from financial inclusion require complementary improvements in intermediary capacity and outreach infrastructure.

Okonkwo and Nwanna (2021) analyzed Nigeria→s financial inclusion→growth nexus for the period 1992→2018 using a selection of provider- and user-side proxies. Their variables included currency outside banks, bank branch penetration rates, deposit volumes, private-sector credit, and real GDP. Methodologically, they combined Ordinary Least Squares (OLS) regression with cointegration and an Error Correction Model (ECM) to separate short-run from long-run impacts. Empirical results indicated that overall increases in outreach and deposit usage were associated with higher GDP, supporting the notion that inclusion fosters aggregate demand and investment. However, the magnitude and significance of the effects varied by proxy: deposit volumes consistently showed stronger positive effects than simple counts of branches. The authors therefore warned policymakers against equating physical presence alone with effective inclusion. They recommended focusing on measures that promote actual usage↑such as lowering account costs and expanding deposit services↑to maximize growth benefits. The paper concluded that indicator choice matters and that targeted policies are needed to amplify the real-economy impact of inclusion.

Nwansi and Dibiah (2023) examined the interplay between financial deepening and economic growth in Nigeria over 1991→2021, emphasizing liquidity and depth as mediating factors. Their

empirical model used broad money to GDP, credit to the private sector, loan-to-deposit and liquidity ratios as core explanatory variables, with real GDP as the response variable. They applied Ordinary Least Squares (OLS) regression together with a battery of robustness checks to ensure coefficient stability and to control for potential specification bias. The results pointed to a statistically significant positive role for broad money and private credit in promoting growth when liquidity conditions were adequate. Conversely, weak liquidity ratios attenuated the positive effects of inclusion, demonstrating that access alone is insufficient without a healthy intermediation environment. The authors argued that monetary depth and inclusion are complementary: deep monetary aggregates support the transmission of inclusion into real economic outcomes. Policy recommendations included measures to strengthen liquidity channels and improve the quality of credit allocation. They concluded that a coordinated approach to monetary management and inclusion is necessary to sustain Nigeria→s growth momentum.

Odumusor, Sackey and Abiji (2024) analyzed financial inclusion and GDP dynamics in Nigeria for 2000→2020 with a focus on causal direction. Their study incorporated rural bank branch loans, ATM density, deposit account penetration, and real GDP as key variables. Employing cointegration techniques and Granger causality tests, they were able to identify both long-run relationships and directional linkages between inclusion metrics and growth. The empirical evidence pointed to bidirectional causality: financial inclusion stimulates economic growth, and growth itself further expands financial access. Among all indicators, rural lending exhibited the strongest causal influence on growth outcomes, underlining the developmental importance of

rural credit. ATM density and deposit accounts contributed positively but with less pronounced causal effects compared to rural loans. The authors recommended targeted rural credit interventions and stronger rural banking networks to achieve more inclusive growth. They concluded that policy must be spatially aware, prioritizing underserved regions to maximize the inclusion→growth feedback loop.

Olajide Oyadeyi (2024) investigated how fintech and banking innovation alter the financial inclusion→growth relationship in Nigeria using recent digital-era data. The study→s explanatory variables included mobile payment volumes, ATM and POS transaction counts, branch networks, and real GDP. ARDL bounds testing and time-series regression analyses were applied to capture short- and long-run dynamics and to control for integration properties of the series. Results showed that electronic payment systems↑particularly mobile money and POS transactions↑substantially amplified the positive effect of inclusion on GDP relative to traditional physical outreach alone. The study found that digital channels reduced transaction costs, increased transaction frequency, and improved the velocity of money, thereby strengthening growth linkages. Short-run estimates revealed faster responsiveness of GDP to digital adoption compared with branch expansion. The author recommended policy support for fintech infrastructure, agent networks, and regulatory sandboxes to accelerate inclusive, digital-enabled growth. The paper concluded that Nigeria→s inclusion strategy must pivot toward a hybrid model that prioritizes both access and digital innovation.

Ozili (2024) focused on the gender dimension of digital financial inclusion in Nigeria and its macroeconomic implications, using disaggregated data through 2022. The study employed gender-disaggregated digital account ownership, measures of internet penetration, and GDP growth as principal variables. Methodologically, the paper combined panel regressions with micro-level assessments to capture heterogeneity across gender and regions. Empirical findings indicated that increased digital access among women significantly contributes to GDP growth, as women's financial participation raises household investment, consumption smoothing, and firm-level entrepreneurship. The analysis also uncovered persistent gender gaps in account ownership and digital usage, with women systematically less likely to hold or actively use digital accounts. Ozili argued that addressing gender-specific barriers—such as identification requirements, digital literacy, and social norms—would materially improve macroeconomic outcomes. Policy prescriptions included targeted fintech solutions for women, gender-sensitive agent networks, and investments in female digital literacy. The study concluded that closing the gender digital divide is both an equity and a growth imperative for Nigeria.

Mbutor and Uba (2013) were among the earliest scholars to empirically link financial inclusion with financial development and GDP outcomes in Nigeria, using data spanning the early 1980s to the 2010s. They constructed composite financial inclusion indices from variables such as branch outreach, deposit account ownership, and private-sector credit, and then related these indices to growth indicators. The study employed index construction techniques and standard multiple regression frameworks to estimate effects and to interpret policy implications. Results

suggested that higher inclusion indexes correlate with stronger financial development metrics, which in turn positively impact real GDP. A key contribution of the paper was the demonstration that inclusion improves the monetary policy transmission mechanism by widening the financial base and reducing informal cash usage. The authors recommended that policymakers monitor multidimensional inclusion indices rather than relying on single proxies. They stressed that enhancing deposit mobilization and credit access remain central to unlocking inclusion's macro benefits. Ultimately, the study argued for integrated strategies that combine outreach expansion with measures to improve the depth and efficiency of the financial system.

Anthony-Orji, Ogbuabor and Onoh (2019) explored how financial inclusion modifies the transmission of monetary policy shocks to output in Nigeria, drawing on VAR methodology. Their model included account penetration rates, branch network measures, credit extension variables, inflation, and real GDP. By implementing Vector Autoregression (VAR) and impulse-response analysis, the authors examined the dynamic repercussions of monetary policy under varying degrees of inclusion. The study found that greater financial inclusion amplifies the responsiveness of GDP to monetary impulses, effectively strengthening policy transmission. This effect was especially visible in economies with wider account penetration and deeper credit markets. The authors highlighted the policy implication that improving inclusion can enhance monetary policy effectiveness, but also noted it may increase sensitivity to certain shocks. Consequently, they recommended pairing inclusion drives with strengthened macroprudential

oversight to manage potential volatilities. The paper concluded that inclusion serves a dual role promoting growth and shaping the mechanics of macroeconomic policy.

Olofin and Afangideh (2018) examined the Nigerian financial structure and its effectiveness in supporting growth, with a particular focus on financial inclusion variables. Their indicators comprised bank credit to the private sector, broad money (M2), branch access measures, and GDP. Using cointegration analysis complemented by Fully Modified OLS (FMOLS) for long-run coefficient estimation, they tested whether outreach and intermediation contributed to growth. Findings revealed that increased financial intermediation and access were positively associated with GDP growth, but the benefits materialized only when credit allocation was productive. In instances of misallocated or speculative credit flows, the positive growth impact was weakened or nullified. The paper therefore emphasized the importance of directing inclusive credit toward productive sectors such as manufacturing, agriculture, and SMEs. The authors recommended regulatory incentives and monitoring to improve credit allocation efficiency. Their conclusion underscored that inclusion without effective credit targeting may not generate sustainable growth.

Onaolapo (2015) focused on the long-run relationship between financial inclusion and macroeconomic performance in Nigeria, employing series that capture loan-to-deposit ratios, rural credit flows, branch network counts, and real GDP. The methodological approach included stationarity testing, cointegration analyses, and an Error Correction Model (ECM) to parse out long-run relationships and short-run adjustments. Empirical results indicated that broader access (measured by branch networks and rural credit availability) and greater usage (loan-to-deposit

ratios) were associated with higher long-run GDP levels. The ECM estimates showed that deviations from long-run equilibria are corrected gradually, indicating persistent but adjustable linkages. Onaolapo stressed that exclusionary practices and limited rural outreach impede poverty reduction and restrain inclusive growth. Consequently, the study called for policy interventions that expand rural banking and encourage lending to productive small-scale enterprises. The paper concluded that a concerted push toward both access and sustainable credit use is essential for Nigeria→s development.

Sakanko, David and Onimisi (2019) performed ARDL bounds testing on Nigerian data covering 1980→2018 to measure the short- and long-run effects of financial inclusion proxies on development. The variables included private sector credit, ATM density, liquidity ratios, and real GDP, among other macro-controls. Their ARDL-ECM approach allowed them to account for variables integrated of different orders and to estimate adjustment speeds to long-run equilibria. The results indicated a statistically significant positive relationship between several inclusion measures and GDP, both in the short run and over the long term. Liquidity ratios and private credit emerged as particularly influential in transmitting inclusion gains into aggregate output. The authors argued for policies aimed at deepening liquidity and expanding ATM/agent networks to broaden transactional reach. They recommended complementary financial infrastructure improvements to sustain inclusion-led growth. The study concluded that inclusion initiatives should be supported by robust liquidity management and outreach programs.

Nma and Callistus (2022) expanded the inclusion discourse by incorporating access to deposit money banks, mobile money penetration, insurance coverage, and microfinance alongside GDP and poverty indicators in their model. They implemented ARDL and ECM estimation techniques to capture both short-run and long-run relationships between inclusion and development outcomes. The empirical findings showed that financial inclusion promotes GDP growth and contributes to poverty reduction, indicating a dual welfare and macroeconomic benefit. However, the study identified substantial coverage gaps—especially in rural and low-income communities—limiting the distributive impact of inclusion. The authors called for targeted policy measures, such as subsidized accounts, agent banking expansion, and tailored microfinance products to reach underserved groups. They also recommended integrating mobile money and insurance schemes to broaden risk management options for vulnerable populations. The study concluded that a multi-pronged approach is required to translate inclusion into equitable growth across Nigeria.

Musa, Salisu, and Magaji (2022) extended the empirical framework for Nigeria by adding financial literacy and institutional quality to standard inclusion metrics such as account ownership and ATM distribution. Their dataset included literacy proxies, governance indices, inclusion measures, and real GDP, and they used ARDL estimation to analyze dynamics. Results showed that financial inclusion combined with higher levels of financial literacy produced larger and more persistent positive effects on GDP. In contrast, low institutional quality—measured through governance and regulatory indicators—dampened the positive impact of inclusion on

growth. The study therefore argued that policy packages must pair inclusion efforts with literacy programs and institutional reforms. The authors recommended national financial education curricula and institutional strengthening to create a conducive environment for inclusion to translate into growth. The conclusion emphasized that inclusion's full potential depends on complementary soft and hard infrastructure.

Okoye and Olusegun (2024) explored the interplay between fiscal policy settings and financial inclusion in shaping Nigeria's economic development. Their empirical model included government expenditure and revenue measures alongside credit provision, account penetration rates, and real GDP. Employing regression analysis and fiscal-financial interaction tests, the study found that prudent fiscal policy and targeted public spending complement inclusion by improving the environment for access to finance. Specifically, well-directed public investment in infrastructure and social services widened the base for financial participation and magnified growth effects from inclusion. The authors cautioned that fiscal deficits and unsustainable public debt could undermine these benefits by crowding out private credit. They recommended coordinated fiscal-financial policy frameworks to leverage public spending for greater financial inclusion. The study concluded that fiscal policy plays a critical supporting role in transforming financial access into sustained economic growth.

Nwiluka, Afuga, Abina (2021), using CBN and World Bank datasets, analyzed how account ownership, bank branch density, and ATM penetration affect Nigeria's GDP at the national and subnational levels. Multiple regression models with robustness checks formed the core of their

empirical strategy, allowing for heterogeneity across regions. The results confirmed a positive association between inclusion indicators and aggregate growth, with stronger effects observed in regions with higher economic activity. Importantly, the study documented persistent rural→urban disparities: rural regions lagged markedly in account ownership and access to transactional infrastructure. The authors recommended targeted rural financial inclusion programs, including agent banking and mobile-money promotion, to reduce spatial inequality in access. They also suggested region-specific regulatory measures to incentivize providers to expand services where market failures persist. The paper concluded that national inclusion targets must be matched with place-based interventions to ensure balanced growth.

Singh and Ghosh (2021) contributed cross-country evidence that has been widely cited in Nigerian studies to explain institutional heterogeneity in inclusion outcomes. Their analysis used panel regressions on global data to investigate how product mix↑payments versus credit↑and institutional quality moderate the inclusion→growth relationship. They found that countries with stronger institutional frameworks derive larger growth dividends from financial inclusion, particularly when the inclusion mix emphasizes credit for productive investment. The study highlighted that payment-only inclusion produces smaller growth gains unless accompanied by effective credit channels and governance. Nigerian researchers have used these findings to interpret why inclusion→s impact in Nigeria appears inconsistent across studies, pointing to institutional constraints and the composition of inclusion services. Singh and Ghosh recommended sequencing reforms: first institutional strengthening, then expansion of credit-

backed inclusion. Their work underscores that inclusion is necessary but not sufficient; institutional quality determines the scale of macroeconomic benefits.

Otiwu, Okoro, Uzowuru and Ozuzu (2018) examined the microfinance channel as a vehicle for financial inclusion and local-level growth in Nigeria, focusing on the period up to 2013 in their dataset. Their variables included microfinance outreach metrics, rural loan volumes, deposit mobilization by MFIs, and real GDP indicators. Using OLS regression and Johansen cointegration techniques, the authors tested both short-run dynamics and long-run equilibria between microfinance activity and growth. The findings showed that expanded microfinance outreach had a positive and statistically significant effect on rural productivity and overall GDP when sustained over time. The study emphasized that properly regulated and institutionally supported microfinance institutions can become critical intermediaries for extending credit to smallholders and microenterprises. It also warned that without adequate supervision, scaling microfinance may introduce fragility through poor-quality lending. The authors recommended complementary regulation, capacity building, and linkages between MFIs and formal banks to maximize growth impacts.

Okoye, Adetiloye, Erin and Modebe (2017) investigated how digital adoption intersects with traditional inclusion measures to influence Nigeria→s growth trajectory. Their empirical variables included internet penetration rates, account ownership figures, POS and ATM transactions, and real GDP. Applying Engle→Granger cointegration tests, Fully Modified OLS, and causality analyses, the studies found consistent evidence that digital access amplifies the positive impact

of financial inclusion on economic growth. Digital channels increased frequency of transactions, broadened payment access, and lowered costs, making financial services more usable and productive. The authors argued that policy should therefore encourage broadband expansion and digital literacy in tandem with traditional banking outreach. They also noted that digital services can rapidly scale inclusion but require consumer protection and cybersecurity measures. The overall conclusion was that digital adoption is a multiplier for inclusion-driven growth in Nigeria.

Imoh, Agbor, Daniel (2019) produced a set of institutional and program-evaluation studies examining agent banking, microfinance expansion, and mobile-money adoption across Nigerian states. Their methodological toolkit included descriptive analyses, panel regressions, and quasi-experimental impact evaluations where micro-data were available. Findings consistently showed that agent networks and microfinance expansion increase account ownership and transactional usage among low-income households. These increases in financial participation translated into better consumption smoothing, higher small-business survival rates, and modest but measurable gains in local economic activity. The researchers also pointed to implementation challenges—agent liquidity issues, weak agent networks in remote areas, and occasional regulatory uncertainty—that can limit impact. Policy recommendations stressed stronger agent support systems, interoperability, and targeted subsidies for last-mile infrastructure. The body of work concluded that institutional arrangements and program design critically determine whether inclusion efforts yield durable growth outcomes.

Nwafor and Yomi (2018) explored the complementarity of internet penetration and conventional financial variables in driving Nigeria's GDP. Their models included internet penetration rates, broad money and credit measures, and real GDP, and estimation relied on FMOLS and cointegration procedures. Empirical results demonstrated that internet adoption facilitates wider financial inclusion by enabling digital accounts, mobile payments, and remote access to services. The interaction term between internet penetration and financial inclusion indicators was positive and significant, indicating that digital infrastructure magnifies the growth returns to inclusion. The authors argued that investments in broadband and mobile networks are therefore critical enablers for realizing inclusion's macroeconomic potential. They urged policymakers to prioritize ICT infrastructure alongside traditional financial sector reforms. The study concluded that bridging the digital divide is a prerequisite for maximizing inclusion-led growth in contemporary Nigeria.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the research design, population of the study, data sources, method of data collection, model specification, method of data analysis, and the limitations of the study. The methodology adopted is aimed at empirically examining the relationship between financial inclusion indicators and economic growth in Nigeria, covering the period 1990 to 2024. The broad time frame provides a rich dataset for analysis but also poses potential challenges relating to structural changes in the economy and financial sector over time.

3.2 Research Design

The study adopts an ex-post facto research design because the variables under consideration such as number of bank branches, number of automated teller machines (ATMs), point-of-sale (POS) transactions, access to credit, and mobile banking usage are already in existence and cannot be manipulated by the researcher. This design is suitable for establishing cause-and-effect relationships between financial inclusion indicators and economic growth, as it allows the researcher to analyze historical data to identify patterns and correlations (Kothari, 2014).

3.3 Population of the Study

The population of the study comprises the Nigeria financial system, particularly data covering the entire banking sector's outreach and usage indicators, and macroeconomic growth variables.

This includes all deposit money banks, microfinance banks, licensed mobile money operators, and point-of-sale service providers operating in Nigeria. ATM operations began in 2009 and POS in the year 2013.

3.4 Data Sources

The study relies on secondary data, which are sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, the Nigeria Deposit Insurance Corporation (NDIC) annual reports, National Bureau of Statistics (NBS) publications, and World Bank Development Indicators (WDI). Data on the number of bank branches, number of ATMs, POS transaction values, domestic credit to the private sector, and mobile banking transaction volumes were collected from the Central Bank of Nigeria (CBN) Statistical Bulletin. Information on insured deposit money banks and financial soundness indicators was obtained from the Nigeria Deposit Insurance Corporation (NDIC) annual reports. Data on the GDP growth rate and other macroeconomic variables were sourced from the National Bureau of Statistics (NBS). Supplementary data on GDP growth rate and domestic credit to the private sector were also obtained from the World Bank Development Indicators (WDI). These sources provide reliable and consistent datasets covering the variables of interest, such as GDP growth rate (proxy for economic growth), number of bank branches, number of ATMs, POS transaction values, domestic credit to the private sector, and mobile banking transaction volumes.

3.5 Model Specification

The model is built on the framework that financial inclusion positively influences economic growth through increased access to and usage of financial services. Economic growth (EG) is the dependent variable, measured by the annual GDP growth rate. Independent variables include bank branch density (BBD), number of ATMs (ATM), POS transaction value (POS), access to credit (CRD), and mobile banking transactions (MOB). The functional form of the model is:

$$EG_t = B0 + B1\ BBD_t + B2\ ATM_t + B3\ POS_t + B4\ CRD_t + B5\ MOB_t + U_t$$

Where:

EGt= Economic Growth at time t

BBDt= Bank Branch Density at time t

ATMt = Number of Automated Teller Machines at time t

POSt= Value of POS transactions at time t

CRDt= Access to credit (domestic credit to the private sector as % of GDP)

MOBt= Mobile banking transaction value

Ut= Error term

3.6 Method of Data Analysis

The study employs Ordinary Least Squares (OLS) regression analysis for data analysis. Stationarity of the variables is tested using the Augmented Dickey-Fuller (ADF) test, while co-integration analysis is conducted using the Johansen co-integration test to examine the long-run equilibrium relationship among variables. Descriptive statistics are used to summarize the data

trends over the years, and diagnostic tests such as serial correlation LM test, heteroskedasticity test, and normality test are also performed to ensure the reliability of results.

3.7 Limitation of the Study

One important limitation of this research is the wide period under review (1990→2024). While this long span makes it possible to observe broad trends in Nigeria→s financial system, it also presents several difficulties. Reliable data on modern financial inclusion indicators, such as mobile banking, mobile money, and point-of-sale transactions, are only available from the late 2000s. In order to preserve accuracy, this study avoids interpolation or artificial generation of values for years where information is missing; analysis is confined to periods with verifiable records. Beyond data gaps, differences in statistical reporting methods, structural changes in the banking sector, and macroeconomic events↑such as inflationary shocks, currency redenomination, the 2004 banking sector reforms, and the 2020 cashless policy↑create challenges for comparing figures across time. These issues highlight the need for results to be interpreted with caution.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter of the research consists of presentation of data for analysis, as well as, estimation of the model, using requisite statistical and econometrics tool for test results and analysis. However, data for estimation is presented in appendix section of the research work.

4.2 Data Analysis

Tables 4.1: Descriptive Statistics

	GDP	ATM	INTB	MOB	POS
Mean	18580.69	765.7707	18.25117	71.67033	80.05583
Median	16879.16	726.9250	14.29000	33.92000	49.37000
Maximum	43012.51	3970.250	91.58000	442.3500	448.5100
Minimum	12583.48	62.59000	3.370000	0.060000	1.870000
Std. Dev.	6851.799	581.8524	15.45020	93.09879	104.4264
Skewness	3.027079	2.912390	2.450053	1.970394	2.145174
Kurtosis	11.19609	16.53602	10.38235	6.609584	6.996179
Jarque-Bera	259.5717	542.8799	196.2753	71.39728	85.94134
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	1114841.	45946.24	1095.070	4300.220	4803.350
Sum Sq. Dev.	2.77E+09	19974578	14083.81	511375.7	643388.1
Observations	60	60	60	60	60

Source: Author's Computations, 2025, using the Eviews 9.0 for Windows

It is important to state that the essence of conducting any descriptive statistics is to determine the features of the data set and also, to determine the variability of the data set: which are revealed by the variance and standard deviation values. Table 4.1 therefore shows the result of the descriptive statistics of the variables of study used in the analysis. It shows that between 2009Q1 and 2023Q4, the average value of GDP, ATM, INTB, MOB and POS, stood at 18580.69, 765.7707, 18.25117, 71.67033 and 80.05583, respectively. The maximum and

minimum values of variables are also being captured in the result; With GDP having a maximum value of 43012.51 and a minimum of 12583.48, within the estimation period. The standard deviation of estimation which reveals and measures the risk and variability of the data of estimation, shows wide disparity from the dependent variable, especially those of INTB, MOB and POS, within the period, while for those of others like ATM, shows not too wide a disparity from the dependent variable of study. The implications of that, is that estimation at levels may lead to result bias, or at best, a spurious regression, as a result of the high standard deviation, especially for those of ATM which is indicative of high risk. Also, a look at the skewness and kurtosis, which shows the direction of skewness of variables of study, we see all the variables from the regression output, skewed to the right hand side of the normal distribution curve. The test for normality shows that not all the independent variables of study are normally distributed. This is shown by the Jacque-Bera statistics, in the probability values. This therefore means that preliminary investigation of data needs to be carried out, which include the ADF test as well as the person spearman-s correlation test.

Table 4.2: The Correlations Results

	GDP	ATM	INTB	MOB	POS
GDP	1.000000				
ATM	-0.163669	1.000000			
INTB	0.116955	0.822146	1.000000		
MOB	-0.103152	0.914822	0.859439	1.000000	
POS	-0.098602	0.880084	0.851823	0.974259	1.000000

Source: Author's Computations, 2024 using the Eviews 9.0 for Windows

The test is carried out to explore the strength and direction of relationship that exist between the dependent and the respective independent variables of study. As such, the table above refers to the correlation matrix, using the Spearman rank order correlation method. The table reveals how variables of interest relate with one another within the sample period. It shows the coefficient of correlation of the dependent variable with respect to itself is 1.000 and which implies that there exist perfect correlations between GDP (dependent variable) with itself, within the period of study. It reveals also that all the independent variable of study exerts a strong, positive relationship with the dependent variable of GDP, except for those of ATM and MOB and POS, variables over the estimation period. This implies that all the variables are not moving together in one (positive) direction; meaning, while some of the variables are moving in positive direction, others were moving in the opposite direction, like the ATM, MOB and POS variables, which were negatively correlated with dependent variable of study. Let us examine the ADF test

statistics of the variables of study in order to ascertain the stationary properties of the variables under study.

Table 4.3: The ADF Unit Root Test Results

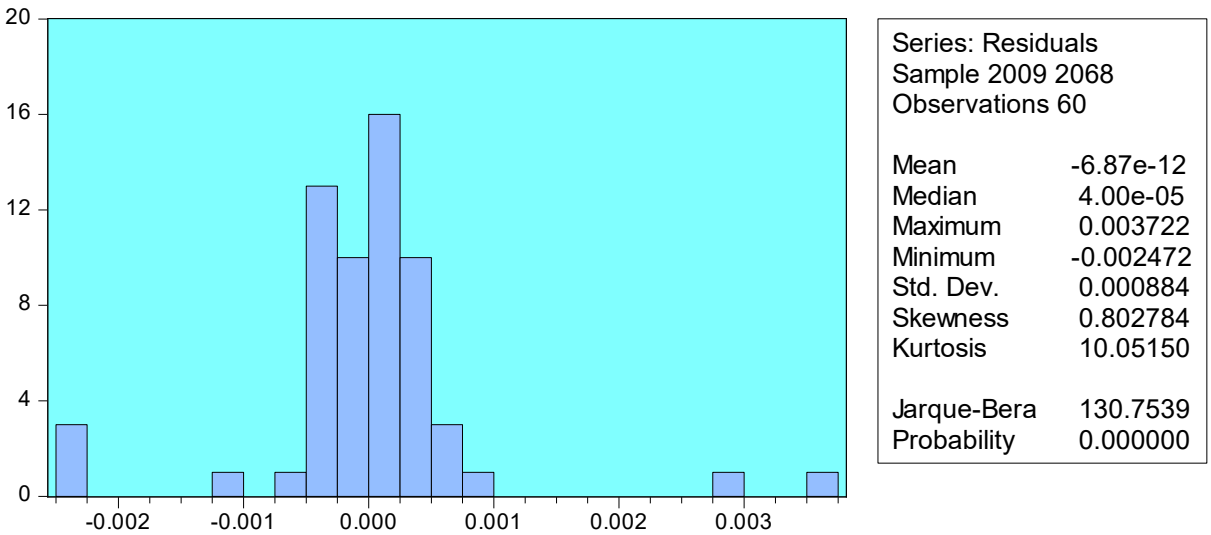
Varaible	Augmented Dickey fuller Intercept and Trend Levels	Augmented Dickey fuller Intercept and Trend 1st Difference	Order of Integration
GDP	1.645319	- 9.203911	**I(1)**
INTB	-3.636170	-6.732254	**I(0)**
ATM	-1.694571	-5.814765	**I(0)**
MOB	-1.138780	-6.100443	**I(0)**
POS		-6.219799	**1(0)**

Souce: Researcher's Computation using Eviews Software 9.0 for Windows.

Tables 4.3 represent the table for the ADF unit root test for stationarity and order of integration of variables of interest in the estimation process. From the results it is seen that all the variables of study, both the dependent and independent had a unit root and while the dependent variable of GDP is integrated of order 1, while all the others, which are the independent variables of the study, were integrated of order 0 (at levels) over the period. The whole essence of the test is to ensure the stationarity property of a good estimator and an estimation of best fit in the regression output. If variables of interest are integrated of a uniform order, say of order 1, we can introduce the error correction mechanism to correct for unexplained systematic variation of the dependent

variable being explained by all the independent variables put together. However, in the case of present study, we may not need to bother about that, because variables of study exhibited a rather non uniform stationary property in the estimation output.

Table 4.4 The Normality Test Graph



The Histogram above represents the normality graph, to test for the normality of data set. That is to test if data set were normally distributed to allow for the estimation of good fit in the regression estimation as it were. As such from the standardized residuals and Jarque-bera statistics, it shows significance at the 1 percent significant level, which implied that variable / data were normally distributed over the period**.**

Table 4.5: Method: OLS Regression Technique

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTB	795.3198	173.8374	4.575079	0.0000
ATM	17.29286	4.756310	3.635772	0.0006
MOB	-188.8110	74.69920	-2.527617	0.0143
POS	3.133587	61.55135	0.050910	0.9596
R-squared	-1.422523	Mean dependent var	18580.69	
Adjusted R-squared	-1.552301	S.D. dependent var	6851.799	
S.E. of regression	10946.38	Akaike info criterion	21.50375	
Sum squared resid	6.71E+09	Schwarz criterion	21.64337	
Log likelihood	-641.1124	Hannan-Quinn criter.	21.55836	
Durbin-Watson stat	1.083286			

Author's computation, Using EVIEWS software for regression output, 2025

The table 4.5 above is the regression output for the dependent and all the independent variables of study. It captures the coefficient of determination: which is represented by the R Squared and the adjusted, over the period. It also captures the coefficient of the respective independent variable of study, as well their probability values, t statistics and the standard error of estimation. It also captures the test of overall relationship between the dependent variable and the

independent variables of study. The overall test of goodness of fit, measured by the F statistics, is also being captured in the regression output. As such, in the results, the estimated output shows variables need must be subjected to further analysis as the error correction mechanism for a better estimation output results.

The R- Squared and the adjusted, which represents the extent to which the independent variables of study can explain systematic variation or changes overtime observed in the dependent variable, shows values of 1.42 and 1.55, percent respectively. This means that all the independent variables put together in the estimation, can best explain about 14 or 15 percent of the systematic variation in the dependent variable of GDP, within the period.

The individual coefficient, which measures individual explanation of the extent of variation of the dependent variable, shows that INTB has 795.3198 coefficient, and highly significant by the probability value. This means that for about 1percent variation in INTB, it will cause GDP to increase by 795.3198 percent overtime. It follows from the regression output; the probability value shows positive and significant impact on GDP within the period. For ATM (numbers of Automated teller machines per 100,000), there tend to be positive and highly significant impact on GDP (proxy variable for economic growth) by 5 percent probability value, which implies a 95 percent confidence level of existence of relationship between them. The coefficient stood at 17.29286, and that implies that a 1 percent increase in ATM will yield about 17.29286, rise in GDP (economic growth variable) during the period. The same goes for MOB, with a coefficient of -188.8110, which implies negative but significant relationship with MCAP, by the probability

value of 0.05 percent. For POS, variable exerted a positive but not significant relationship with GDP, having a probability value of 0.95 percent which indicates a 5 percent confidence level of existing relationship with GDP, with a coefficient of about 3.133587, means that a percentage rise in the variable will yield about 3.133587 decrease in GDP over the period and vice versa.

Furthermore, the hypotheses of study, which are stated in their null form, imply non existence of relationship amongst independent variables and the dependent variable (GDP) of study. From the results, that is with the probability values, is rejected for all the others except for the POS variables of study, and while the alternative is then accepted for the others of INTB, ATM and MOB variables of estimation. The F statistics, the overall test for the goodness of best fit, shows an equation of line of best fit by the f value and the probability which stood at 30.149 and at 1 percent significance. Also, the Durbin Watson statistics stood at 1.8 shows presence of autocorrelation in the regressors during the estimation period. As a result of the analysis of model of estimation, an improved technique of the Error correction mechanism is being employed to account for the unexplained variation or changes in the dependent variables by the independent variables of study.

Furthermore, the test for granger casualty shows a one way directional causation between the dependent variable of GDP as against the respective independent variables of the study. The results shows that GDP does not granger cause INTB, ATM, MOB and POS, and vice versa. See appendix for the results output

Table 4.5: Method: Error Correction Technique

Variable	Coefficient	Std. Error	t-Statistic
INTB	-431.5075	2.28E-05	-18958546
MOB	19.08676	9.95E-06	1918877.
POS	-38.42535	7.58E-06	-5070745.
ATM	21.65278	7.65E-07	28312439
ECM1	1.000000	1.75E-08	57191242
C	336318.5	0.000370	9.08E+08
R-squared	1.000000	Mean dependent var	343315.9
Adjusted R-squared	1.000000	S.D. dependent var	12157.70
S.E. of regression	0.001344	Akaike info criterion	-10.29119
Sum squared resid	9.76E-05	Schwarz criterion	-10.08175
Log likelihood	314.7356	Hannan-Quinn criter.	-10.20927
F-statistic	9.65E+14	Durbin-Watson stat	1.518676
Prob(F-statistic)	0.000000		

Author→s computation, Using EVIEWS software for regression output, 2025

The result is the error correction technique for the short run equilibrium. This no doubt is an improvement on the long run estimation output. Here, all the independent variables became significant at the 1 percent degree of statistical significance, and at the 99 percent confidence level. Also, the Durbin Watson statistic is indicative of absence of autocorrelation, as well as multi co linearity, which is often the case with times series data analysis.

4.3 Discussion of Findings

That internet banking has positive and significant impact on economic growth in Nigeria within the period of study; and that ATM variable, which stands for the numbers of automated teller machine transactions, has positive and strong relationship with the growth of the Nigerian economy and GDP, as seen also in mobile banking opreations in the regression output. The implications are that if when these variables are engaged productively, it will not only increase gdp overtime, but also it will increase growth of the Nigeria economy

Consequently, that the POS (which stands for the point of sale variable), exerted a rather a not significant impact on GDP, Proxy variable for economic growth within the period; and that POS variables had positive but not significant relationship with GDP variable over the estimation period; is a pointer that Financial inclusion variables (some, if not all), play a crucial role in the development and growth of the Nigerian economy, especially in the areas of the capital market. This implies that the more of financial inclusion indicators as internet banking, automated teller machine transactions, and volume of mobile transactions, increases overtime, the more the gross domestic and economic grows overtime, and vice versa. There might be some policy implications attached to these findings.

CHAPTER FIVE

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1 Summary of Findings

The findings from this work are summarised below:

That numbers of internet banking operations (INTB), has positive and significant impact on the growth of the Nigeria economy by impacting greatly on GDP, within the period;

That numbers of automated teller machine transactions (ATM) has positive and significant impact on economic growth and GDP within the period;

That volume of mobile banking transactions (MOB), has positive and strong relationship with economic growth, as Seen in the regression output; and

That the POS variable has insignificant relationship with GDP, at least on the short run, while the long run analysis shows a rather non-significant relationship with economic growth variable within the estimation period.

5.2 Recommendations

Commercial Banks should amongst other things increase their number of internet banking operations, in a particular area per time, as this will boost the growth of the economy by increasing the gross domestic product within the period.

The Nigeria government through the central bank should by way of regulating the operations of the commercial banking operations, encourage more coverage of the ATM transactions

especially to the rural areas. This will not only include the activities in the villages in the GDP but also boost economic growth overytime.

The CBN, through their instruments of regulation should ensure more mobile banking transactions via the wallets and other mediums; this also will boost the market capitalization over time, and increase growth of the economy.

For the non-significant impact on the GDP by the POS variable, commercial Banks should generate more number of banks POS services in their outlets, to make transactions faster with less interest rate, so as to ensure it contributes significantly on the long run to the growth of the Nigeria economy.

5.3 Conclusion

The topic of study has been financial inclusion and economic growth in Nigeria and the main objective of the study was to determine the impact of financial inclusion indicators on GDP, which represents the growth variable of the Nigeria economy. The research design employed in the work was the causal or expost- facto research design and data estimation technique was the OLS regression technique and the ECM. The data analysis software was the Eviews 9.0 for windos. The findings suggested a significant relationship between financial inclusion variables and Economic growth variable of GDP, except for the POS variable which was not significantly impacting on the growth variable, at least on the long run.

It was however recommended that the CBN, through their instruments of regulation should ensure more mobile banking transactions via the ATM machines and wallets; internet banking

operations as well as point of sales; as this will create a boost in the GDP and thus, economic growth over time.

5.4 Suggestion for further studies

Our suggestions for further studies hails from the fact that, not all financial inclusion variables were captured in our study, further studies can capture all the others not captured in the present study.. Also, further studies can use numbers of commercial bank branches, credit to private sector and growth of GDP as proxy for economic growth. However, present study serves as a platform for further research and has contributed to the body of extant literature.

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APPENDICES

DATA PRESENTATION

YEAR	GDPPC	GDP	ATM	POS	INTB	MOB
2009Q1	312029.8	43012.51	137.72	3.51	4.38	0.06
Q2	315952.4	43012.51	145.57	2.75	5.19	0.11
Q3	319875.1	43012.51	126.12	2.48	52.27	0.52
Q4	323797.7	43012.51	139.19	2.29	22.31	0.58
2010Q1	327720.3	12,583.48	62.59	2.77	3.37	0.87
Q2	329684.4	12,934.53	80.72	2.67	4.26	1.37
Q3	331648.6	14,304.44	114.9	2.8	9.94	1.84
Q4	333612.8	14,789.82	141.5	4.48	7.48	2.57
2011Q1	335576.9	13,450.72	333.51	6.28	24.13	3.32
Q2	336733.2	13,757.73	364.67	6.45	22.01	3.72
Q3	337889.4	14,819.62	387.48	8.64	6.36	5.01
Q4	339045.7	15,482.97	476.08	9.65	7.11	6.93
2012Q1	340201.9	13,915.51	454.79	1.87	6.38	1.08
Q2	343446.2	14,323.05	483.25	8.74	6.93	4.93
Q3	346690.4	15,645.43	499.71	14.75	7.53	7.26
Q4	349934.7	16,045.90	546.91	22.66	10.72	18.24
2013Q1	353178.9	14,535.42	611.26	26.28	11.37	22.88
Q2	356302.4	15,096.76	675.09	30.94	9.36	28.92
Q3	359425.9	16,454.37	729.23	43.15	12.3	33.92
Q4	362549.4	17,132.16	813.36	60.64	14.29	57.08
2014Q1	365672.9	15,438.68	784.05	67.47	16.6	66.36
Q2	365747.9	16,084.62	852.36	70.25	14.13	74.16

Q3	365822.8	17,479.13	1,027.92	78	18.94	86.48
Q4	365897.8	18,150.36	1,015.55	96.35	24.37	119.47
2015Q1	365972.7	16,050.60	675.09	30.94	9.36	28.92
Q2	362295.7	16,463.34	729.23	43.15	12.3	33.92
Q3	358618.6	17,976.23	813.36	60.64	14.29	57.08
Q4	354941.6	18,533.75	3,970.25	448.51	91.58	442.35
2016Q1	351264.5	15,943.71	1,069.99	144.76	31.69	135.24
Q2	349845.5	16,218.54	1,134.50	163.71	26.28	168.28
Q3	348426.6	17,555.44	1,246.80	189.95	30.76	223.06
Q4	347007.6	18,213.54	1,536.85	260.58	43.63	230.31
2017Q1	345588.6	15,797.97	1,502.06	285.98	46.57	260.59
Q2	345237.1	16,334.72	1,544.23	324.13	37.09	295.24
Q3	344885.6	17,760.23	1,558.76	364.55	45.58	239.36
Q4	344534.1	18,598.07	1,832.55	435.15	55.35	306.82
2018Q1	344182.6	16,096.65	483.25	8.74	6.93	4.93
Q2	344174	16,580.51	499.71	14.75	7.53	7.26
Q3	344165.3	18,081.34	1,134.50	163.71	26.28	168.28
Q4	344156.7	19,041.44	1,246.80	189.95	30.76	223.06
2019Q1	344148.1	16,434.55	675.09	30.94	9.36	28.92
Q2	340823.5	16,931.43	729.23	43.15	12.3	33.92
Q3	337498.8	18,494.11	813.36	60.64	14.29	57.08
Q4	334174.2	19,527.72	813.36	60.64	14.29	57.08
2020Q1	330849.6	16,741.81	345.04	45.42	9.36	28.92
Q2	332087.9	15,897.93	587.33	49.37	12.3	33.92
Q3	333326.3	17,824.48	824.62	52.45	14.29	57.08
Q4	334564.6	19,550.15	948.7	75.44	14.29	57.08

2021Q1	335802.9	16,826.89	345.04	45.42	9.36	28.92
Q2	336737.5	16,694.67	587.33	49.37	12.3	33.92
Q3	337672.1	18,543.05	824.62	52.45	14.29	57.08
Q4	338606.7	20,329.06	948.7	75.44	14.29	57.08
2022Q1	339541.3	17,349.38	541.02	58.61	15.52	35.81
Q2	340156.1	17,285.88	787.33	45.37	12.3	54.92
Q3	340770.9	18,959.95	724.62	62.45	14.29	64.07
Q4	341385.8	21,044.25	763.7	68.44	14.29	65.04
2023Q1	342000.6	17,750.06	345.04	45.42	9.36	28.92
Q2	345178.9	17,719.34	587.33	49.37	12.3	33.92
Q3	348357.2	19,442.28	824.62	52.45	14.29	57.08
Q4	351535.5	21,773.26	948.7	75.44	14.29	57.08
CBN Statistical Bulletin (2023) and the World Bank Data						

Financial Inclusion and Economic Growth in Nigeria

	GDP	ATM	INTB	MOB	POS
Mean	18580.69	765.7707	18.25117	71.67033	80.05583
Median	16879.16	726.9250	14.29000	33.92000	49.37000
Maximum	43012.51	3970.250	91.58000	442.3500	448.5100
Minimum	12583.48	62.59000	3.370000	0.060000	1.870000
Std. Dev.	6851.799	581.8524	15.45020	93.09879	104.4264
Skewness	3.027079	2.912390	2.450053	1.970394	2.145174
Kurtosis	11.19609	16.53602	10.38235	6.609584	6.996179

Jarque-Bera	259.5717	542.8799	196.2753	71.39728	85.94134
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	1114841.	45946.24	1095.070	4300.220	4803.350
Sum Sq. Dev.	2.77E+09	19974578	14083.81	511375.7	643388.1
Observations	60	60	60	60	60

Group unit root test: Summary

Series: GDP, ATM, INTB, MOB, POS

Date: 10/25/25 Time: 09:42

Sample: 2009 2068

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 4

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.62129	0.0044	5	291
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W--	-6.74159	0.0000	5	291

stat

ADF - Fisher Chi-square	65.1714	0.0000	5	291
PP - Fisher Chi-square	82.6451	0.0000	5	295

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Null Hypothesis: GDP has a unit root

Exogenous: Constant

Lag Length: 4 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.943968	0.0468
Test critical values:	1% level	-3.555023	
	5% level	-2.915522	
	10% level	-2.595565	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GDP)

Method: Least Squares

Date: 10/25/25 Time: 09:45

Sample (adjusted): 2014 2068

Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.332026	0.112782	-2.943968	0.0049
D(GDP(-1))	0.045016	0.045004	1.000283	0.3221
D(GDP(-2))	-0.052161	0.043608	-1.196110	0.2374
D(GDP(-3))	-0.012384	0.040076	-0.309023	0.7586
D(GDP(-4))	0.152672	0.039904	3.826006	0.0004
C	5777.715	1918.741	3.011202	0.0041

R-squared	0.397177	Mean dependent var	167.0870
Adjusted R-squared	0.335664	S.D. dependent var	1545.678
S.E. of regression	1259.833	Akaike info criterion	17.21801
Sum squared resid	77771726	Schwarz criterion	17.43700
Log likelihood	-467.4954	Hannan-Quinn criter.	17.30270
F-statistic	6.456841	Durbin-Watson stat	1.982818
Prob(F-statistic)	0.000111		

Null Hypothesis: ATM has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=10)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.876519	0.0002

Test critical values:	1% level	-3.546099
	5% level	-2.911730
	10% level	-2.593551

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ATM)

Method: Least Squares

Date: 10/25/25 Time: 09:46

Sample (adjusted): 2010 2068

Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ATM(-1)	-0.579414	0.118817	-4.876519	0.0000
C	455.6469	113.9431	3.998899	0.0002

R-squared	0.294384	Mean dependent var	13.74542
Adjusted R-squared	0.282004	S.D. dependent var	626.1616
S.E. of regression	530.5757	Akaike info criterion	15.41911
Sum squared resid	16046103	Schwarz criterion	15.48954
Log likelihood	-452.8638	Hannan-Quinn criter.	15.44660
F-statistic	23.78043	Durbin-Watson stat	2.181401
Prob(F-statistic)	0.000009		

Null Hypothesis: INTB has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.195678	0.0001
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INTB)

Method: Least Squares

Date: 10/25/25 Time: 09:47

Sample (adjusted): 2010 2068

Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTB(-1)	-0.636325	0.122472	-5.195678	0.0000
C	11.82437	2.934218	4.029819	0.0002

R-squared	0.321389	Mean dependent var	0.167966
Adjusted R-squared	0.309483	S.D. dependent var	17.48090
S.E. of regression	14.52616	Akaike info criterion	8.223090

Sum squared resid	12027.54	Schwarz criterion	8.293515
Log likelihood	-240.5812	Hannan-Quinn criter.	8.250581
F-statistic	26.99507	Durbin-Watson stat	2.012784
Prob(F-statistic)	0.000003		

Null Hypothesis: MOB has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.961655	0.0030
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(MOB)

Method: Least Squares

Date: 10/25/25 Time: 09:48

Sample (adjusted): 2010 2068

Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

MOB(-1)	-0.426852	0.107746	-3.961655	0.0002
C	31.66461	12.67371	2.498449	0.0154

R-squared	0.215899	Mean dependent var	0.966441
Adjusted R-squared	0.202143	S.D. dependent var	86.24144
S.E. of regression	77.03332	Akaike info criterion	11.55966
Sum squared resid	338245.5	Schwarz criterion	11.63009
Log likelihood	-339.0101	Hannan-Quinn criter.	11.58715
F-statistic	15.69471	Durbin-Watson stat	2.195445
Prob(F-statistic)	0.000209		

Null Hypothesis: POS has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.752478	0.0056
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(POS)

Method: Least Squares

Date: 10/25/25 Time: 09:49

Sample (adjusted): 2010 2068

Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POS(-1)	-0.391529	0.104339	-3.752478	0.0004
C	32.59397	13.73393	2.373244	0.0210

R-squared	0.198099	Mean dependent var	1.219153
Adjusted R-squared	0.184031	S.D. dependent var	92.64842
S.E. of regression	83.69027	Akaike info criterion	11.72543
Sum squared resid	399231.5	Schwarz criterion	11.79586
Log likelihood	-343.9003	Hannan-Quinn criter.	11.75292
F-statistic	14.08109	Durbin-Watson stat	2.145391
Prob(F-statistic)	0.000412		

CORRELATION MATRIX

	GDP	ATM	INTB	MOB	POS
GDP	1.000000	-0.163669	0.116955	-0.103152	-0.098602
ATM	-0.163669	1.000000	0.822146	0.914822	0.880084
INTB	0.116955	0.822146	1.000000	0.859439	0.851823
MOB	-0.103152	0.914822	0.859439	1.000000	0.974259
POS	-0.098602	0.880084	0.851823	0.974259	1.000000

Pairwise Granger Causality Tests

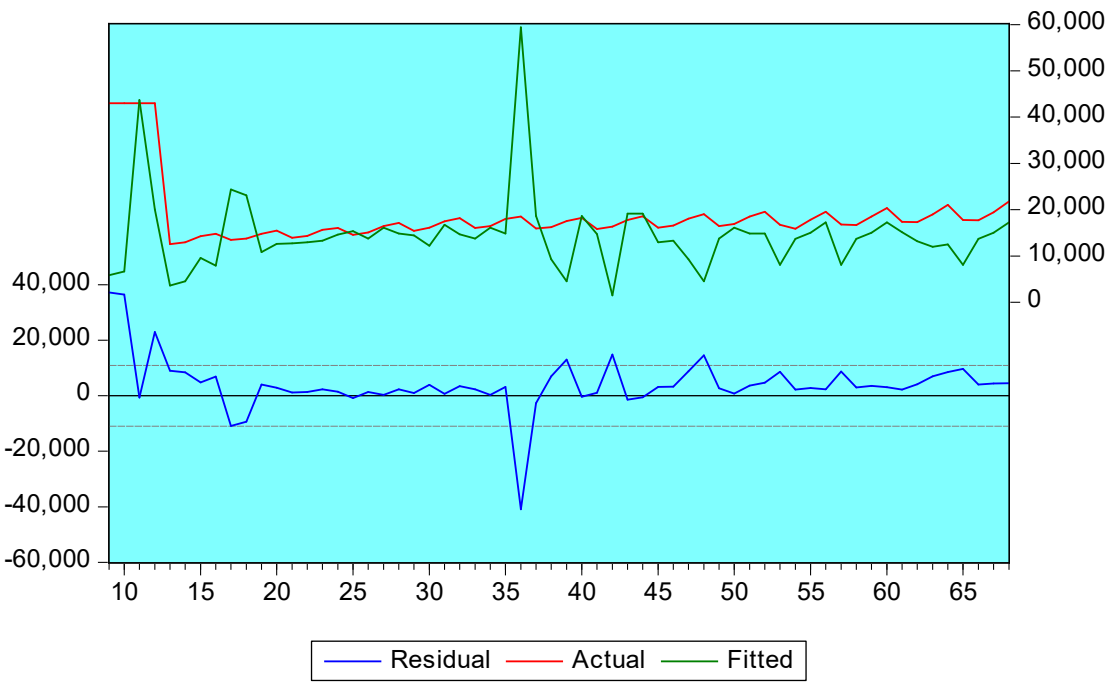
Date: 10/25/25 Time: 09:54

Sample: 2009 2068

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
ATM does not Granger Cause GDP	58	0.08272	0.9207
GDP does not Granger Cause ATM		1.24698	0.2957
INTB does not Granger Cause GDP	58	3.33599	0.0432
GDP does not Granger Cause INTB		0.59790	0.5536
MOB does not Granger Cause GDP	58	0.08382	0.9197
GDP does not Granger Cause MOB		0.42427	0.6564
POS does not Granger Cause GDP	58	0.10791	0.8979
GDP does not Granger Cause POS		0.40824	0.6669
INTB does not Granger Cause ATM	58	0.94026	0.3969
ATM does not Granger Cause INTB		0.78644	0.4607
MOB does not Granger Cause ATM	58	0.22931	0.7959
ATM does not Granger Cause MOB		0.45824	0.6349
POS does not Granger Cause ATM	58	0.35917	0.6999
ATM does not Granger Cause POS		1.11881	0.3343
MOB does not Granger Cause INTB	58	2.95633	0.0606
INTB does not Granger Cause MOB		0.78101	0.4631

POS does not Granger Cause INTB	58	1.81337	0.1731
INTB does not Granger Cause POS		0.77656	0.4651
POS does not Granger Cause MOB	58	1.51595	0.2290
MOB does not Granger Cause POS		3.20772	0.0484



Dependent Variable: GDPPC

Method: Least Squares

Date: 10/25/25 Time: 10:15

Sample: 2009 2068

Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTB	-431.5075	175.5220	-2.458424	0.0171
MOB	19.08677	76.70670	0.248828	0.8044
POS	-38.42535	58.43785	-0.657542	0.5136
ATM	21.65278	5.897725	3.671378	0.0005
C	336318.5	2856.033	117.7572	0.0000

R-squared	0.322166	Mean dependent var	343315.9
Adjusted R-squared	0.272869	S.D. dependent var	12157.70
S.E. of regression	10367.11	Akaike info criterion	21.41032
Sum squared resid	5.91E+09	Schwarz criterion	21.58485
Log likelihood	-637.3096	Hannan-Quinn criter.	21.47859
F-statistic	6.535211	Durbin-Watson stat	0.541650
Prob(F-statistic)	0.000224		

Dependent Variable: GDPPC

Method: Least Squares

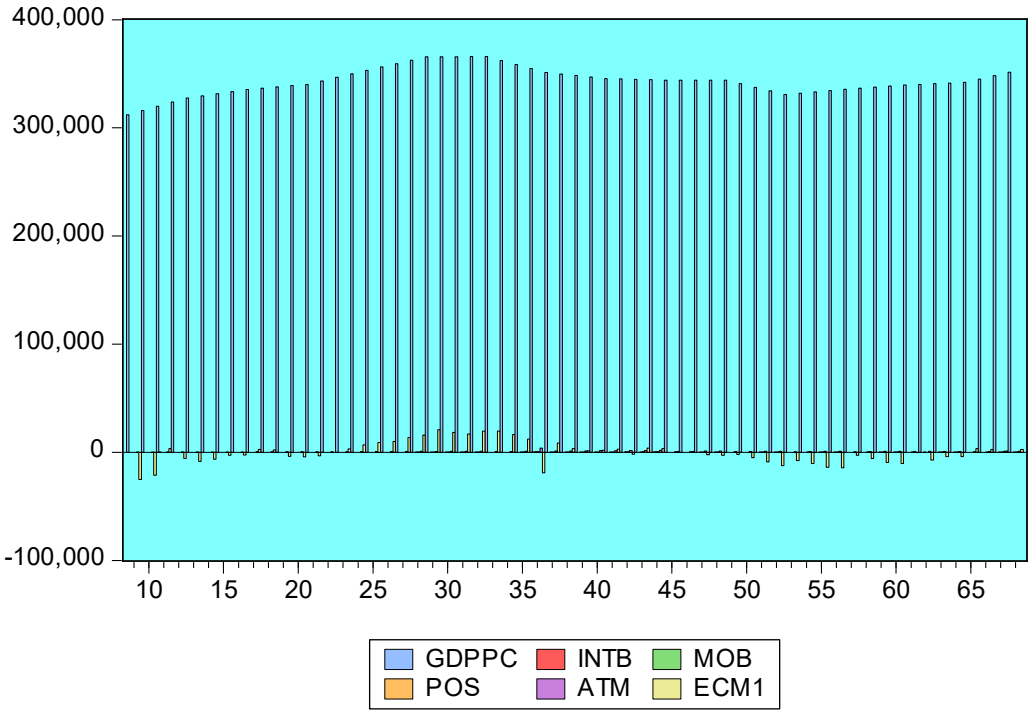
Date: 10/25/25 Time: 10:28

Sample: 2009 2068

Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTB	-431.5075	2.28E-05	-18958546	0.0000
MOB	19.08676	9.95E-06	1918877.	0.0000
POS	-38.42535	7.58E-06	-5070745.	0.0000
ATM	21.65278	7.65E-07	28312439	0.0000
ECM1	1.000000	1.75E-08	57191242	0.0000
C	336318.5	0.000370	9.08E+08	0.0000

R-squared	1.000000	Mean dependent var	343315.9
Adjusted R-squared	1.000000	S.D. dependent var	12157.70
S.E. of regression	0.001344	Akaike info criterion	-10.29119
Sum squared resid	9.76E-05	Schwarz criterion	-10.08175
Log likelihood	314.7356	Hannan-Quinn criter.	-10.20927
F-statistic	9.65E+14	Durbin-Watson stat	1.518676
Prob(F-statistic)	0.000000		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ECM1