



Lead City Journal of the Social Sciences (LCJSS)

Faculty of Management and Social Sciences
Lead City University, Ibadan

ISSN: 2449092X
Volume 11 (No. 1) / Feb. 2026

Teachers' Motivational Strategies and Productivity in Selected Secondary Schools in Akinyele Local Government, Oyo State, Nigeria

Abdulahi Abiola Olaniyi

Prospecting Digital HR for Sustainable Local Government Administration in Nigeria

Oluwatomisin Joy Popoola and Akeem Amodu, PhD

Digital Transformation and Operational Efficiency in Local Government Administration of Oyo State

Adenike Olufunmilayo Odunsi, PhD and Oladunni Ajoke Akinola, PhD

Exploring the Relationship between Work Expectations and Employee Retention among Generation Z in Selected Small and Medium Enterprises in Nigeria.

Aderounmu G.A, Oni K. A, Otegbade T.O and Shonola Olayinka Sakirat

Infertility-Related- Stress and Coping Strategies as Predictors of Mental Well-being among Individuals with Reproductive Health Challenges in Ibadan Oyo State Nigeria

Aderonke Abolusodun and Johnson T. Oyeleke PhD

Building Psychological Resilience and Mental Health Support Systems for a Sustainable Future of Work in Nigeria

Abiona, Olabisi Modupe & Bamidele, Motunrayo Oluwagbemisola

Human Capital Development and Organizational Performance in Selected Manufacturing Companies in Nigeria

Olusola James Oladejo, Mary Etigale Ochom & Opatotun Tunde Adewumi

Enhancing Crop Yields through Credit Access among Female Smallholder Farmers in Ogun State, Nigeria

Adeyemi Olaoluwa Bamigboye and Tina Akinbo (PhD)

Digital Banking and Financial Inclusion in Nigeria

Adewumi Moyosore Akingbade, Opatotun Tunde Adewumi, and Ibikunle Oladipupo Ibadapo

Editor-in-Chief: Prof. Omolara Campbell
Editor: Dr. Omoseni Adepoju

Associate Editors

Dr. Tosin Adesina
Dr. Tina Akinbo
Dr. Tunde Onamusi
Dr. Olufemi Badru
Dr. O. S. Falase
Dr. Olorunfemi Y. Alimi

Advisory Board

Prof. 'Jide Owwoeye	Lead City University, Ibadan, Nigeria
Prof. Kabiru A. Adeyemo	Lead City University, Ibadan, Nigeria
Prof. Toyin Falola	University of Texas, Houston
Prof. Uche Isiugo-Abanihe	Lead City University, Ibadan, Nigeria
Prof. Bola Akanji	University of Connecticut, United States
Prof. J. J. Asongu	St. Monica University, Buea, Cameroon
Prof. Olatundun Adelegan	UN Women Suomi, Helsinki, Finland
Prof. B. A. Folorunso	Obafemi Awolowo University, Ile-Ife, Nigeria
Prof. Phillip Alege	Covenant University, Ota, Ogun State, Nigeria
Dr. Folasade Ayorinde	Green Climate Fund Songolo, South Korea
Dr. Taiwo Ajilore	Central Bank of Nigeria
Dr. Michael Ogunseyin	University of Wolverhampton, United Kingdom

Correspondence

The Editor-in-Chief
Lead City Journal of the Social Sciences (LCJSS)
Faculty of Management and Social Sciences
Lead City University, Ibadan, Nigeria
www.lcu.edu.ng/index.php/lead-city-journal-of-the-social-sciences
e-mail: (i) editor.lcjss@gmail.com
(ii) campbell.omolara@lcu.edu.ng
(iii) omolaracampbell@yahoo.com
+2348033176177, +2348033234042

Published by
Lead City University, Press
Beside Methodist School, Toll-Gate Area, Lagos-Ibadan Express Way, Ibadan
07064671658, 08036694838
lcupress23@gmail.com

Lead City Journal of the Social Sciences (LCISS) ISSN: 2449092X

About the Journal

LCISS is intended for scholars who wish to report results of completed or on-going research, reviews of literature and discussions of theoretical issues or policy. Its primary objective is to provide a forum for the exchange of the ideas across disciplines and academic orientations in the social sciences.

The journal is an open access peer reviewed journal that provides bi-annual publication of articles in the social sciences. The editorial board is made up of reputable scholars from various universities around the world. All correspondence should be addressed to the Editor-in-Chief, Lead City Journal of Social Sciences (LCJSS), Lead City University, Ibadan, Nigeria.

Guidelines for Contributions

Authors should note that any article to be submitted for publication must comply with the following standard:

- The manuscript content must not be more than 15 pages. Any violation of this rule will be subjected to extra charges.
- Abstract (in italics) should be a maximum of 250 words with a minimum of 3-5 keywords.
- The title and author(s) details should be on the first page. This should include telephone numbers and e-mail contacts.
- Author's name should be written in the following order: first name, other name and surname.
- The body of text should be in Times New Roman, properly justified in 12 pt. with 1.5line spacing.
- Referencing style is APA, 7th edition. All references should be listed in alphabetical order at the end of the article.
- The format for the body of article is: Introduction, Literature Review, Methodology, Results and Discussion, Conclusion and References. Also, authors should know that they are responsible for ensuring that:
 - i. The manuscript had been submitted only to this journal, i.e. It is not under consideration or peer review or accepted for publication or in press or published elsewhere;
 - ii. The manuscript contains nothing that is abusive, defamatory, libelous, obscene, fraudulent or illegal.

Non-compliance with any of the latter three conditions will be considered misconduct and dealt with accordingly.

The author or lead author of an article is entitled to one copy of the LCJSS in which his/her article appears. Authors of the accepted papers shall pay a processing fee of N10,000 (Ten thousand naira only) and publication fee of N35,000 (thirty-five thousand naira only).

Any author who wishes to publish his/her article in the journal should contact:

The Editor-in-Chief

Contents

Teachers' Motivational Strategies and Productivity in Selected Secondary Schools in Akinyele Local Government, Oyo State, Nigeria

Abdulahi Abiola Olaniyi 5

Prospecting Digital HR for Sustainable Local Government Administration in Nigeria

Oluwatomisin Joy Popoola and Akeem Amodu, PhD 18

Digital Transformation and Operational Efficiency in Local Government Administration of Oyo State

Adenike Olufunmilayo Odunsi, PhD and Oladunni Ajoke Akinola, PhD 28

Exploring the Relationship between Work Expectations and Employee Retention among Generation Z in Selected Small and Medium Enterprises in Nigeria.

Aderounmu G.A, Oni K. A, Otegbade T.O and Shonola Olayinka Sakirat 43

Infertility-Related- Stress and Coping Strategies as Predictors of Mental Well-being among Individuals with Reproductive Health Challenges in Ibadan Oyo State Nigeria

Aderonke Abolusodun and Johnson T. Oyeleke PhD 59

Building Psychological Resilience and Mental Health Support Systems for a Sustainable Future of Work in Nigeria

Abiona, Olabisi Modupe & Bamidele, Motunrayo Oluwagbemisola 78

Human Capital Development and Organizational Performance in Selected Manufacturing Companies in Nigeria

Olusola James Oladejo, Mary Etigale Ochom & Opadotun Tunde Adewumi 89

Enhancing Crop Yields through Credit Access among Female Smallholder Farmers in Ogun State, Nigeria

Adeyemi Olaoluwa Bamigboye and Tina Akinbo (PhD) 105

Digital Banking and Financial Inclusion in Nigeria

Adewumi Moyosore Akingbade, Opadotun Tunde Adewumi, and Ibikunle Oladipupo Ibidapo 120

Digital Banking and Financial Inclusion in Nigeria

¹Adewumi, Moyosore Akingbade, ²Opadotun, Tunde Adewumi, ³Ibikunle, Oladipupo Ibidapo

^{1,3}*Department of Management and Accounting, Lead City University, Ibadan, Nigeria*

¹*Department of Accounting, Adeseun Ogundoyin Polytechnic, Eruwa².*

¹*adewumi.moyosore@lcu.edu.ng || +234 8080806179;*

²*tundeopadotun16@gmail.com || +2348022130589;*

³*ibikunle.oladipupo@lcu.edu.ng||+2348186425501*

Abstract

The study focuses on digital banking as a tool for financial inclusion, potentially overlooking other important factors that contribute to financial inclusion, such as traditional banking services, microfinance institutions, and government policies. The study used financial data from secondary sources, including the Central Bank of Nigeria data depository, the Statistical Bulletin, and the World Bank Data 2023. Thus, the study employs secondary data. Descriptive statistics and correlation analysis were carried out to provide an overview of the data's characteristics. The study found that while ATM, POS, and mobile banking had positive relationships with the human development index, none were statistically significant; however, Web Pay had a negative relationship and a significant impact on the human development index. Also, for the second model, only Web Pay showed a significant positive relationship with the poverty index, while ATM showed a negative relationship and had no significant impact. POS and mobile banking did not show significant effects, but they have a positive relationship with the poverty index. The study concluded that payment systems, particularly mobile banking and web payments, play an increasingly significant role in the economy.

Keywords: Digital Banking, Financial Inclusion, Automated Teller Machine, Point of Sales, Mobile Banking.

Introduction

Digital banking has revolutionized the global financial ecosystem, providing greater accessibility, efficiency, and inclusiveness in financial services. In developing countries like Nigeria, where a significant proportion of the population is financially excluded, digital banking has emerged as a promising tool to promote financial inclusion, a crucial aspect of sustainable economic development (Nnaomah et al., 2024). Financial inclusion is defined as the availability and accessibility of affordable financial products and services for all individuals, particularly the low-income and marginalized groups. Approximately 45% of Nigeria's adult population remains unbanked or underbanked, relying on informal financial systems or lacking access to financial services altogether (Ramos, and Olweny, 2021; Adbi, et al., 2022; Ene, et al., 2019). This exclusion disproportionately affects rural areas and disadvantaged demographics, exacerbating economic inequalities and limiting opportunities for growth. To address this, digital banking has become a cornerstone of Nigeria's financial

inclusion strategy. Mobile banking applications, agent banking networks, and fintech innovations are increasingly being utilized to bridge the gap between formal financial institutions and underserved populations. Iwedi *et al.*, (2022) asserted that digital banking has become a critical enabler of financial inclusion, significantly altering the dynamics of access to financial services. This transformation is driven by the proliferation of internet-based banking services, making them more accessible, efficient, and convenient than ever before. Also, Ekong and Ekong, (2023) opined that the impact of digital banking is profound, offering not just enhanced service delivery but also promising a pathway to integrate the underserved and unbanked populations into the formal financial ecosystem. The potential for digital banking to drive financial inclusion is particularly notable in developing countries, where traditional banking infrastructure is often limited. Financial inclusion stands as a vital goal in the global agenda for promoting equitable economic growth and alleviating poverty (Yunus *et al.*, 2023; Ubah *et al.*, 2023).

In Nigeria, successive governments since the 1970s have intervened by establishing policies to promote financial inclusion. One major policy was the adoption of the rural banking scheme in 1977, which was only partially successful. In the digital era, the focus has shifted to leveraging technology to drive financial inclusion. Notable initiatives under this strategy include promoting agent banking networks, mobile banking, and digital payment systems. A landmark development in digital banking was the introduction of the e-naira, Africa's first Central Bank Digital Currency (CBDC), in 2021. By 2024, the e-naira had achieved over 13 million wallet registrations and facilitated transactions exceeding ₦7 billion, demonstrating its growing impact on financial inclusion (CBN, 2024). However, significant barriers persist, including unreliable internet connectivity, limited digital literacy, and limited awareness of digital banking services, high transaction costs, cybersecurity concerns, and mistrust in financial institutions. Additionally, gender disparities, where women are less likely to own or use mobile banking services, continue to widen the financial inclusion gap. The interplay of these factors raises critical questions about the overall effectiveness of digital banking in driving financial inclusion across Nigeria's diverse population. Nigeria's financial system is characterized by stark disparities, with a large segment of the population excluded from formal financial services. Although digital banking is seen as a solution to these challenges, its effectiveness as a tool for achieving widespread financial inclusion remains uncertain, particularly in Nigeria's unique socio-economic and infrastructural context. Factors such as poor digital infrastructure, high transaction costs, digital literacy, and regulatory environment still pose challenges in addressing the complexities of digital financial services. Gender disparities also remain a critical issue, as women in Nigeria, especially those in rural areas, are less likely to own mobile phones or have access to mobile banking services compared to their male counterparts (Ene, *et al.*, 2019). While the growth of fintech companies and digital payment platforms has shown potential to improve financial access, there is limited empirical evidence on the extent to which these innovations have successfully addressed the root causes of financial exclusion in Nigeria. The lack of understanding of the actual impact of digital banking on financial inclusion necessitates further investigation (CBN, 2024; Enebeli-Uzor & Mukhtar, 2023; Nwafor, 2018). This study critically examines the effectiveness of digital banking as a tool for financial inclusion in

Nigeria, evaluating the successes and limitations of existing initiatives, identifying key barriers to adoption, and providing evidence-based recommendations to enhance the reach and impact of digital banking services.

Literature Review

Automated Teller Machine (ATM): An ATM is an electronic banking outlet that allows customers to perform basic banking functions without a bank teller. They have modernized the banking sector in Nigeria, increasing accessibility and reducing long queues. However, challenges such as limited coverage in rural areas, network downtime, cash shortages, and card fraud persist. ATMs attract and retain customers, increase cash, provide convenience, reduce bad cheques, and save costs, positively impacting the Nigerian economy (Nnaomah, *et al.*, 2024).

Point of Sale (POS): POS terminals are electronic devices used by businesses to accept debit or credit card payments at the point of sale. They process payments through card networks such as Visa, Mastercard, and Verve. In Nigeria, POS terminals are increasingly popular for small businesses to expand cashless transactions. The Central Bank of Nigeria and other regulatory bodies encourage their adoption as part of Nigeria's push towards a cashless economy. POS systems contribute to financial inclusion by providing a simple tool for businesses in remote or underserved areas. They facilitate basic banking and financial transactions, eliminating issues related to regular cash transactions. Benefits of POS services include increased income from transaction fees, increased market share, enhanced customer and merchant loyalty, competitive advantage, and mobile banking (Mesfin, *et al.*, 2023; Yunus, *et al.*, 2023; Ubah, *et al.*, 2023).

Mobile Banking: Mobile banking is a popular method of financial inclusion in Nigeria, particularly in rural areas with limited traditional banking infrastructure. It involves using mobile phones for transactions such as checking account history, transferring funds, and paying bills. However, challenges such as network connectivity, security concerns, and limited internet access in rural areas can undermine its effectiveness. Mobile banking products provide basic banking services via SMS-driven platforms, enabling customers to check balances, perform account transactions, and make payments. The services offered include mini statements, account activity alerts, term deposit monitoring, access to loan statements, pension plan management, and domestic and international funds transfers. A study by Ramos and Olweny (2021) in Nigeria suggests that the volume of mobile banking transactions positively impacts the Nigerian economy's economic growth.

Web Banking: Web pay is an online payment system that enables users to make payments for goods and services, particularly in Nigeria, as e-commerce and online businesses grow. It has been used for utility bills, shopping, and travel bookings. However, challenges like online fraud, internet access issues, and a lack of trust in online payment systems persist. Web pay allows customers to access their accounts, perform financial transactions, and use electronic card infrastructure for payment instructions and final settlement of goods and services over the internet (Mesfin, *et al.*, 2023; Ubah, *et al.*, 2023).

Financial Inclusion in Nigeria

Nigeria, a developing nation with a population of over 200 million, faces challenges in financial inclusion. With 70 million people living in rural areas, 19% lack formal education and have limited financial literacy. The country has implemented policies to ensure access to modern banking systems, such as the 2005 bank consolidation program, which forced deposit money banks to operate branches in rural areas (Mesfin, *et. al.*, 2023; Yunus, *et. al.*, 2023; Ubah, *et. al.*, 2023). This increased bank access, enabling rural dwellers to use basic banking services such as savings accounts, credit, and remittances. This stimulated rural entrepreneurship and economic growth. The consolidation program also led to the establishment of microfinance banks, providing loans to micro, small, and medium enterprises. The Nigerian Government has committed to enhancing financial inclusion through its national financial inclusion strategic plan, aiming to reduce the number of adults who cannot access financial services from 46.3% to 20% and increase the formal sector's share of financial inclusion from 30% to 70% by 2020. The plan includes a simplified, risk-based, tiered framework, an agent banking regulatory framework, and a national financial literacy framework. Measures such as mobile payment systems and cashless policies aim to remove barriers to accessing financial services and ensure that adult Nigerians can obtain essential financial services regardless of their social status (CBN 2018; EFINA 2018).

The Nexus between Digital Banking and Financial Inclusion and Economic Development in Nigeria.

The emerging field of digital banking strategies, including mobile banking, online platforms, and digital wallets, has significantly enhanced financial inclusion worldwide. The advent of mobile banking has been a cornerstone in the democratization of financial services, enabling access in the most remote and rural areas. The significance of mobile banking lies in its ability to transcend geographical barriers and infrastructural deficiencies, thereby broadening the spectrum of financial inclusion. Studies have shown that mobile banking platforms offer a wide range of services, from simple account operations to more complex financial transactions, which have been instrumental in fostering an inclusive financial culture among previously excluded segments of the population. Online platforms, as an extension of digital banking, have revolutionized the delivery and consumption of financial services (Uchenna *et. al.*, 2024; Ozili, 2018). They have not only facilitated access to banking operations from virtually anywhere but have also been vital in promoting financial literacy. The interactive nature of online platforms, coupled with the wealth of resources they offer, provides users with invaluable insights into financial management practices. This, in turn, empowers individuals with the knowledge and confidence to make informed financial decisions, further embedding the principles of financial inclusion into the fabric of society. Digital wallets represent a significant leap forward in the evolution of digital banking strategies, offering a secure and efficient mechanism for conducting financial transactions. Digital banking has significantly impacted financial inclusion in Nigeria, bridging the gap between the unbanked and the financial system. It allows individuals to access banking services without visiting a branch, transfer money and make payments using mobile devices, and access microloans and other financial services through mobile banking platforms and digital wallets. The Central

Bank of Nigeria (CBN) set an ambitious goal to increase the financial inclusion rate from 36.3% to 70% by 2020 through initiatives such as agent banking, mobile payments, and a tiered Know Your Customer (KYC) framework. A more inclusive financial system directly contributes to economic growth by increasing access to capital, enhancing economic participation, improving efficiency in financial transactions, boosting government programs and subsidies, and promoting digital literacy and economic resilience. However, Nigeria still faces challenges such as low internet penetration, cybersecurity threats, limited financial literacy, and a lack of a robust regulatory framework.

Schumpeter's Theory of Economic Growth and Development

Joseph A. Schumpeter's economic growth and development theory, introduced in his 1911 work "The Theory of Economic Development," focuses on four key features: the circular flow, the role of the entrepreneur, the cyclical process, and the end of capitalism. Schumpeter argues that economic activity produces itself continuously, with costs equal to receipts and prices to average costs. Entrepreneurship is a key figure in the development process, initiating it and advancing it. In Nigeria, the development of a robust financial sector can enhance the availability of funds for entrepreneurs and innovators, facilitating economic transformation and growth. Technological advancements in the financial sector, such as digital banking and mobile payments, improve access to finance for entrepreneurs and small businesses, particularly in underserved areas. This increased access can spur innovation and economic growth in Nigeria. Schumpeter's theory also suggests that the creation of bank credit accelerates money incomes and prices, leading to a boom or prosperity period. The Schumpeterian Growth model mitigates diminishing returns through creative destruction, underscoring the importance of health and education as drivers of economic development.

Innovation and Technology Adoption Theories

Innovation and technology adoption theories focus on how new technologies are developed, spread, and utilized within economies. Key frameworks include Everett Rogers's Diffusion of Innovations Theory and the Technology Acceptance Model (TAM). The DIT theory, proposed by Rogers, identifies five innovative characteristics: relative advantage, compatibility, complexity, trialability, and observability. It also emphasizes the importance of communication channels and social systems in spreading innovation. In Nigeria, communication campaigns and social media platforms play a significant role in increasing awareness of digital banking. The study can explore the time dimension of adoption, the financial inclusion of adoption, factors that delay or accelerate adoption, and the long-term impact of increased adoption on financial inclusion and economic development. The TAM framework, focusing on perceived usefulness, ease of use, and attitude toward use, determines a user's behavioural intention to adopt a technology. Factors such as financial literacy programs, government policies, and the accessibility of digital infrastructure significantly influence the adoption of digital banking technologies. Institutional support and government policies also play a crucial role in fostering an environment conducive to innovation and technology adoption. Social norms, cultural attitudes, and trust in technology also influence the diffusion of financial innovations. Understanding these factors is critical

for policymakers and financial institutions seeking to bridge the gap between technological innovations and inclusive growth.

Empirical Literature Review

Nnaomah *et. al.*, (2024) examined the role of digital banking in advancing financial inclusion in the United States and Nigeria, aiming to identify and compare practices and outcomes in these two distinct economic contexts. Through a comprehensive review of existing literature and analysis of case studies, the study explores how digital banking platforms and services have been implemented and their impact on underserved populations. The research methodology includes a comparative analysis of secondary data, policy documents, and interviews with key stakeholders in the banking sector of both countries. The key findings revealed that digital banking has significantly contributed to financial inclusion by providing accessible, affordable, and convenient financial services. In the USA, technological advancements and a robust regulatory framework have fostered a competitive digital banking environment, leading to innovative solutions to reduce barriers to financial access.

Conversely, in Nigeria, despite facing infrastructural and regulatory challenges, mobile banking and digital payment services have seen rapid growth, driven by the necessity to reach unbanked populations in remote areas. The paper concluded that while both countries have made strides in leveraging digital banking for financial inclusion, the success and scale of implementation vary due to differences in economic development, regulatory environments, and technological infrastructure. Mesfin *et. al.*, (2024) investigated the effect of financial technology (Fintech) for financial inclusion in Ethiopia during this digital economic era. Secondary data were collected from nine commercial banks (panel units) from 2015 to 2020. The random-effect model was applied to estimate the effects of explanatory variables on the variable of interest, based on the Hausman test results and after testing all model assumptions. Accordingly, the findings revealed that ATM, mobile banking, POS, and agent banking had a statistically significant positive effect on financial inclusion. Iwedi (2023) empirically tested the effect of the digital banking model on financial inclusion in Nigeria. The study adopted the financial time series methodology in collecting quarterly data, and these secondary data were extracted from the Central Bank of Nigeria Statistical Bulletin (2021) for a period of twelve (12) years, ranging from 2009 to 2021. Quarterly time-series data on the volume of transactions on automatic teller machines (ATMs), point-of-sale (POS), web banking technology (WBT), and mobile banking technology (MBT) in Nigeria serve as the independent variables. At the same time, the ratio of total deposit to gross domestic product was used as a proxy for financial inclusion in Nigeria. The estimation technique of the pairwise Granger causality test was used to analyze the data. The pairwise Granger causality test was used because it has proven useful for determining whether one time series is useful for forecasting another. The paper found that the digital banking model significantly and critically influences Nigeria's financial inclusion. Therefore, we conclude that, despite the challenges faced by banks in Nigeria, there remains significant potential to expand mobile and internet-based banking services to improve financial inclusion in the country. Ogunrinde (2023) investigated the impact of the Central Bank Digital Currency (CBDC) on digital financial inclusion using a quantitative research design and data collected from Nigerians.

This was a correlational quantitative research study that used a survey questionnaire distributed to 500 members of the Nigerian public who used the e-naira. The results indicate that CBDC has a positive impact on digital financial inclusion: it facilitates improved access to financial services, reduces transaction costs, increases the number of banked individuals, and enhances the efficiency of digital payments. Also, Ubah, *et. Al.*, (2023) examined the effect of digital banking on financial inclusion in Nigeria. The delay in the actualization of CBN's financial inclusion vision, despite the introduction and proliferation of digital banking instruments, serves as the motivation for this study. The specific purpose of this study was to examine the effect of agency banking, web banking and USSD banking on financial inclusion in Nigeria. The study was anchored in the theory of technological acceptance. POS values were used as a proxy for agency banking; financial deepening values were used as a proxy for measuring financial inclusion, while web banking and USSD banking values were also upheld. Relevant data covering 2010 to 2021 were obtained from the CBN payment system database. The data obtained were analyzed using the ordinary least squares regression of EViews (version 12, University edition). The result showed that POS and USSD banking have a significant effect on financial inclusion, while there is no significant relationship between web banking and financial inclusion.

Gap of the Study

Digital banking has significantly improved financial inclusion and economic development globally, but there is a significant gap in understanding its impact in developing economies like Nigeria. The country faces challenges, including limited digital infrastructure, low financial literacy, limited trust in technology, socioeconomic and cultural factors, and policy and regulatory gaps. Nigeria's lack of reliable internet connectivity and digital banking services leads to unequal access to financial inclusion. Trust in technology is also a concern, with concerns about fraud, cybersecurity, and system reliability. Socioeconomic and cultural factors, such as gender disparities and economic status, have not been adequately explored in Nigeria. Policy and regulatory gaps in Nigeria are also significant, with insufficient analysis of their effectiveness in bridging the inclusion gap through digital banking. This study aims to fill these gaps by exploring the impact of digital banking innovations on financial inclusion and economic development in Nigeria.

Methodology

An ex post facto research design was utilized in the current study because it is considered appropriate for the study on digital banking and financial inclusion in Nigeria. Since the current research study focuses on the Nigerian economy, which is aggregated across all sectors, the study's population is taken to be the Nigerian economy. However, aggregating data on the Nigerian economy for analysis purposes makes sampling impractical in this context. Hence, the entire population was considered for the study analysis over the 15-year period from 2009 to 2023. The study uses financial data from secondary sources, including the Central Bank of Nigeria data depository, the Statistical Bulletin for various years, and the World Bank Data 2023. Thus, the study employs secondary data. These data include statistical information on Automated Teller Machine (ATM), Point of Sale (POS), Mobile

banking (MOB), and Web pay (WEP) for Digital banking, as well as the Human Development Index and the Poverty Index for Financial Inclusion.

Model specification

The study employs the econometric model for Ordinary Least Squares Regression; the functional relationship of the model is:

$$Y_t = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \varepsilon_t \dots\dots\dots 1$$

Where:

Y_t = Dependent Variable

$X_1 - X_n$ = Independent variables

$\beta_1 - \beta_n$ = co-efficient of the independent variables

β_0 = constant that measures Y_t at zero level of the independent variables

$$FINICL = f(ATM, POS, MOB, WEP) \dots\dots\dots 2$$

The econometric relationship is specified as follows:

Model 1

$$HDI = \beta_0 + \beta_1 ATM_t + \beta_2 POS_t + \beta_3 MOB_t + \beta_4 WEP_t + \varepsilon_t \dots\dots\dots 3$$

Model 2

$$POVI = \beta_0 + \beta_1 ATM_t + \beta_2 POS_t + \beta_3 MOB_t + \beta_4 WEP_t + \varepsilon_t \dots\dots\dots 4$$

Where:

HDI = Human Development Index

POVI = Poverty Index

ATM = Automated Teller Machine

POS = Point of Sale

MOB = Mobile Banking

WEP = Web Pay

$\beta_0 - \beta_4$ = Regressions Parameters

ε_t = error term

The study will make use of computer software 'E-views' version to analyze the data.

Analysis and Interpretation of Data

Descriptive Statistic for Model 1

	LATM	LPOS	LMOB	LWEBPAY	LHDI
Mean	8.463059	6.647436	6.639986	6.948693	-0.658233
Median	8.514816	6.632002	6.629231	4.885525	-0.652005
Maximum	10.39354	11.61139	12.30047	13.90821	-0.601480
Minimum	5.990739	2.400619	0.239017	3.220874	-0.729811
Std. Dev.	1.319564	2.876280	3.579326	4.121457	0.042498
Skewness	-0.274406	0.099199	-0.068320	0.919573	-0.344769
Kurtosis	2.360681	2.010536	2.117386	2.041131	1.913241
Jarque-Bera	0.443702	0.636500	0.498549	2.688681	1.035318
Probability	0.801035	0.727421	0.779366	0.260712	0.595914
Sum	126.9459	99.71154	99.59980	104.2304	-9.873491
Sum Sq. Dev.	24.37750	115.8219	179.3621	237.8097	0.025286
Observations	15	15	15	15	15

Source: E View's Output, 2025

The descriptive statistics of Model 2 reveal the central tendency, dispersion, and shape of the distributions of the independent variables (LATM, LPOS, LMOB, LWEBPAY) and the dependent variable (LHDI - Human Development Index). The mean values for these variables are 8.46, 8.46, 6.65, 6.64, 6.64, 6.64, 6.64, 6.95, and -6.95 respectively. The median values are close to their means, indicating symmetrical distributions. The maximum and minimum values show variability in ATM usage over time, with LATM having the lowest variability. LPOS and LWEBPAY have higher variability, especially for Web Pay, while LHDI has a low standard deviation, indicating consistency across observations. Skewness values indicate symmetrical distributions, with LATM, LPOS, LMOB, and LWEBPAY showing near-zero values. LWEBPAY indicates a moderate positive skew, with higher values of Web Pay more frequent, and LHDI suggests a slight negative skew. Kurtosis values are near 2, indicating distributions close to normal. All variables have Jarque-Bera probabilities above 0.05, confirming that the data are normally distributed. Each variable is based on 15 observations, ensuring consistency in data availability. The results provide valuable insights into the distribution of data and the factors influencing it.

Regression Analysis for Model 1

Dependent Variable: LHDI
 Method: Least Squares
 Date: 12/29/24 Time: 16:43
 Sample: 2009 2023
 Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.818652	0.048275	-16.95809	0.0000
LATM	0.011180	0.007809	1.431751	0.1827
LPOS	0.012552	0.005989	2.095933	0.0625
LMOB	0.000473	0.005454	0.086788	0.9326
LWEBPAY	-0.002990	0.001055	-2.834922	0.0177
R-squared	0.974543	Mean dependent var		-0.658233
Adjusted R-squared	0.964360	S.D. dependent var		0.042498
S.E. of regression	0.008023	Akaike info criterion		-6.551778
Sum squared resid	0.000644	Schwarz criterion		-6.315762
Log likelihood	54.13834	Hannan-Quinn criter.		-6.554293
F-statistic	95.70340	Durbin-Watson stat		1.527786
Prob(F-statistic)	0.000000			

Source: E View's Output, 2025

Regression results for Digital Banking Channels and the Human Development Index (LHDI) show that ATM, POS, and mobile banking have a positive relationship with the Human Development Index, meaning that for every unit increase in these variables, the Human Development Index increases. However, only Web Pay showed a negative relationship with HDI, with a coefficient value of -0.002990. The p-values for ATM, POS, and mobile banking (0.1827, 0.0625, and 0.9326, respectively) indicate that none of these variables have a statistically significant effect on HDI. However, only web pay has a significant impact human development index. The model fit well, explaining 97.45% of the variation in the human development index. The adjusted R-squared value of 0.9644 suggests a good model fit, and the S.E. of regression value of 0.0080 indicates that the residuals are small, meaning that the predictions are close to the observed values. The F-statistic of 0.000, with its corresponding p-value, confirms the model's overall significance. However, the Durbin-Watson statistic indicated negative autocorrelation in the residuals.

Descriptive Statistics for Model 2

	LATM	LPOS	LMOB	LWEBPAY	LPOVI
Mean	8.463059	6.647436	6.639986	6.948693	4.417550
Median	8.514816	6.632002	6.629231	4.885525	4.388009
Maximum	10.39354	11.61139	12.30047	13.90821	4.630643
Minimum	5.990739	2.400619	0.239017	3.220874	4.261129
Std. Dev.	1.319564	2.876280	3.579326	4.121457	0.110630
Skewness	-0.274406	0.099199	-0.068320	0.919573	0.433511
Kurtosis	2.360681	2.010536	2.117386	2.041131	2.072126
Jarque-Bera	0.443702	0.636500	0.498549	2.688681	1.007922
Probability	0.801035	0.727421	0.779366	0.260712	0.604133
Sum	126.9459	99.71154	99.59980	104.2304	66.26325
Sum Sq. Dev.	24.37750	115.8219	179.3621	237.8097	0.171345
Observations	15	15	15	15	15

Source: E View's Output, 2025

The study focuses on the distributions and spread of variables in a dataset, including LATM (Log of ATM usage), LPOS (Log of POS usage), LMOB (Log of Mobile Banking usage), LWEBPAY (Log of Web Payment usage), and LPOVI (Log of Overall Payment Volume Index). The variables show relatively high variability, with LMOB having the highest standard deviation, indicating a wider spread in mobile banking usage. LWEBPAY has the highest maximum value, showing that web payment usage can spike much higher than the other variables, but also has a larger standard deviation. LPOVI shows lower variability than the other variables, as indicated by its smaller standard deviation and a relatively narrow range between the maximum and minimum values. Skewness and Kurtosis values for most variables are close to normal, suggesting distributions are fairly symmetric, though LATM and LWEBPAY show slight skewness. These descriptive statistics provide insights into the distributions and spreads of the variables in the dataset, which will be helpful for interpreting the regression analysis results.

Regression Analysis for Model 2

Dependent Variable: LPOVI

Method: Least Squares

Date: 12/29/24 Time: 16:53

Sample: 2009 2023

Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.325855	0.106901	40.46585	0.0000
LATM	-0.021801	0.017292	-1.260755	0.2360
LPOS	0.015411	0.013261	1.162076	0.2722
LMOB	0.018018	0.012077	1.491976	0.1666
LWEBPAY	0.007788	0.002336	3.334043	0.0076
R-squared	0.981578	Mean dependent var		4.417550
Adjusted R-squared	0.974209	S.D. dependent var		0.110630
S.E. of regression	0.017767	Akaike info criterion		-4.961793
Sum squared resid	0.003157	Schwarz criterion		-4.725776
Log likelihood	42.21345	Hannan-Quinn criter.		-4.964307
F-statistic	133.2075	Durbin-Watson stat		1.518239
Prob(F-statistic)	0.000000			

Source: E View's Output, 2025

The regression analysis reveals a strong relationship between the Poverty index and automated teller machines, point-of-sale systems, mobile banking, and web pay from 2009 to 2023. The model has high explanatory power, accounting for approximately 98.16% of the variation in LPOVI. After adjusting for the number of variables, the model still explains about 97.42% of the variation in the poverty index. The results indicate that only the automated teller machine has a negative relationship with the poverty index, with a coefficient value of -0.021801, while point of sale, mobile banking, and Web pay all have a positive relationship with the poverty index, with coefficient values of 0.015411, 0.018018, and 0.007788, respectively. However, the result also shows that only Web pay has a significant effect on the poverty index with a p-value of 0.0076, which is less than the 0.05 level of significance. Automated teller machines, point-of-sale, and mobile banking do not have a significant effect on the poverty index, with p-values of 0.2360, 0.2722, and 0.1666, respectively. The adjusted R-squared value of 0.9742 indicates that the model still explains about 97.42% of the variation in LPOVI after adjusting for the number of variables. The F-statistic of 0.000 indicate that the model is statistically significant at the 5% level.

Discussion of Findings

The study's findings highlight the impact of digital banking channels on human development and poverty reduction. The correlation matrices for both models reveal strong positive relationships between the dependent variables (Human Development Index and Poverty Index) and independent variables (ATM, POS, Mobile Banking, and Web Pay usage). This demonstrates that digital banking channels contribute significantly to financial inclusion, which supports human development and poverty alleviation. However, the evaluation of the relationship between digital banking and the human development index revealed that

automated teller machine usage has a positive but statistically insignificant relationship with the human development index, implying that while ATMs contribute to human development, the effect is not significant at the observed levels. Point-of-sale usage also positively correlates with the human development index, approaching statistical significance, indicating its growing role in expanding access to financial services. Also, mobile banking shows a positive but insignificant relationship, suggesting that mobile banking has potential for human development but requires further adoption or efficiency improvements. Lastly, Web Pay usage has a statistically significant negative relationship with human development index, possibly reflecting challenges such as limited accessibility or higher transaction costs, reducing its utility for financial inclusion. Also, analysis on the relationship between digital banking and poverty index revealed that ATM, POS, Mobile Banking, and Web Pay exhibit strong positive correlations with the poverty index. This highlights their importance in reducing poverty by improving access to financial services.

Several studies revealed findings that align with our study's results; these studies include those by Nnaomah et al. (2024), Mesfin et al. (2024), Iwedi (2023), Ekong and Ekong (2022), Ubah et al. (2023), Kalu and Jeremiah (2021), and Enebeli-Uzor and Mukhtar (2023). These studies highlight the critical role of digital banking technologies in expanding access to financial services and reducing the number of unbanked individuals. However, some studies present divergent findings. Ubah et al. (2023) found mixed results: POS and USSD banking showed a significant positive effect on financial inclusion, whereas web banking showed no significant relationship. Kalu and Jeremiah (2021) found a positive, but non-significant, relationship between mobile banking and POS transactions among the banking adult population. Enebeli-Uzor and Mukhtar (2023) suggested that digital credit and lending rates hinder financial inclusion, while our study found that digital banking generally facilitates greater inclusion through improved accessibility and affordability.

Conclusion and Recommendations

The study concludes that digital banking channels play a vital role in human development and poverty alleviation by fostering financial inclusion. However, the effectiveness of each channel varies, including ATM, POS, and Mobile Banking, which have positive impacts on human development and poverty reduction, although their individual effects were not consistently significant. While web pay usage requires targeted interventions to improve its accessibility and affordability, ensuring its contribution to financial inclusion. Prior to these findings, the study recommends the following:

- a) Policymakers should improve infrastructure for digital banking, particularly mobile banking and Web Pay, to boost adoption rates.
- b) Targeted interventions should reduce transaction costs and improve accessibility, especially in rural areas.
- c) Banks and fintech companies should expand POS terminals and mobile banking solutions to underserved areas, addressing network reliability and digital literacy barriers.
- d) Financial literacy campaigns should be organized to educate users about the benefits and efficient use of digital banking channels.

Contribution to Knowledge

This study highlights the significant impact of digital banking channels on human development and poverty alleviation, providing empirical evidence for policymakers and financial institutions to prioritize investments in digital banking infrastructure to enhance socio-economic outcomes.

References

- Abdi, A. A., Hussein, F. M., & Kadir, H. B., (2022). Effect of Electronic Banking on Financial Inclusion Among Deposit Money Banks in Somalia. *International Journal of Finance and Accounting*, 7(2), 43-54
- CBN. (2013). National financial inclusion strategy. Retrieved August 26, 2024 from <https://www.cbn.gov.ng/out/2013/ccd/nfis.pdf>.
- Central Bank of Nigeria (2022). "Adoption of the eNaira: Issues and the Way Forward." *CBN Economic and Financial Review*, 60(4), 171-180. Retrieved from google
- EFinA. (2022). Access to Financial Services in Nigeria Survey; 2020. Available:<https://efina.org.ng/wpcontent/uploads/2021/10/A2F-2020-Final-Report.pdf>
- Ekong, U. M., & Ekong, C. N., (2022). Digital currency and financial inclusion in Nigeria: lessons for development. *Journal of Internet and Digital Economics*, 2(1), 46-67
- Ene, E.E., Abba, G.O. and Fatokun, G.F. (2019) The Impact of Electronic Banking on Financial Inclusion in Nigeria. *American Journal of Industrial and Business Management*, 9, 1409-1422. <https://doi.org/10.4236/ajibm.2019.96092>
- Enebeli-Uzor, S. & Mukhtar, A. (2023). Efficacy of Digital Finance on Financial Inclusion: Evidence from the Nigerian Banking Industry. *Journal of Economics, Management and Trade*, 29(11); 140-152. DOI:10.9734/JEMT/2023/v29i111169
- Iwedi, M., Kocha, C. N., & Wike, C., (2022). Effect of Digitalization of Banking Services on the Nigeria Economy. *Banking and Insurance Academic Journal*, 2(1), 1-9
- Kalu I. A. & Jeremiah J. O. (2021). An analytical study of financial inclusion through electronic banking in Nigeria, *Fuoye Journal of Accounting and Management*.1(4). 139 – 161
- Mesfin, M., Wondwossen, J. & Mubarek, O. (2024) The effect of financial technology on financial inclusion in Ethiopia during the digital economy era, *Cogent Social Sciences*, 10:1, 2309000, DOI: 10.1080/23311886.2024.2309000
- Nnaomah, U. I., Aderemi, S., Olutimehin, D. O., Orieno, O. H., & Ogundipe, D. O., (2024). Digital Banking and Financial Inclusion: A Review of Practices in the USA and Nigeria. *Finance & Accounting Research Journal*, 6(3), 463-490. DOI:10.51594/farj.v6i3.971
- Nwafor, M. C., (2018). Nexus between Internet Penetration and Financial Inclusion in Nigeria. *International Journal of Research and Innovation in Social Science*, 2(10), 220-226
- Ozili, P. K. (2018). *Impact of digital finance on financial inclusion and stability*. Borsa Istanbul Review, 329-340.
- Ramos, P.K. & Olweny, T. (2021). The influence of digital money on economic growth in Kenya. *Account and Financial Management Journal*, 6(11), 2538 –2556.

- Ubah, J. C., Adigwe, P. K., Okaro, C. S., & Okoye, N. J., (2023). Effect of Digital Banking on Financial Inclusion in Nigeria. *African Banking and Finance Review Journal*, 2(2), 256-272
- Yinusa, O.G., Olowofela, O.E., Yunusa, A.L. & Folami, R.A. (2021). Effect of financial innovation on economic growth: Evidence from African countries. *International Journal of Commerce and Finance*, 7(1), 130 – 140.
- Yunus, A. B., Abdulrafiu, D., Abdulmumin, B. A., Opefolu, F. O., & Hanafi, M. O., (2023). Impact of Financial Inclusion on Banks Performance in Nigeria. *Nigerian Journal of Banking and Financial Issues*, 9(1), 101-115.