



## FINANCIAL TECHNOLOGY AND AGRIBUSINESS DEVELOPMENT IN NIGERIA

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### ABSTRACT

This study examines the influence of financial technology on the development of agribusiness in Nigeria between 2001 and 2020. Using a retrospective design, the research analyzes data from the Central Bank Statistical Bulletin to explore the relationship between digital finance technologies and agribusiness growth. A model is developed based on a comprehensive review of existing literature, with agricultural sector credit serving as a proxy for agribusiness and various financial technology platforms representing digital finance technologies. The Auto-Regressive Distributed Lag (ARDL) model is employed for data analysis, and diagnostic tests confirm the model's validity and reliability. The findings reveal that point-of-sales and mobile money payment systems have a positive impact on agribusinesses in Nigeria, whereas automated teller machine payment systems have a negative effect. The study recommends promoting financial inclusiveness in rural and agricultural areas to sustain the positive effects of digital finance technologies on Nigerian agribusiness.

**Keywords:** Financial technology, agribusiness, technology, point of sales, automated teller machine, mobile money, payment system

**JEL:** C1, E6, E32

### INTRODUCTION

Nigeria's reliance on oil and gas revenue necessitates diversification and exploration of alternative revenue streams. Agriculture, with the right support and enabling environment, can be a viable option. Digital financing technologies can facilitate agribusiness development by providing access to financial services, enhancing financial inclusion, and addressing challenges in the agricultural value chain, particularly in rural areas.

Digital financial services (DFS) offer a range of benefits, including convenient access to credit facilities, savings, and other financial services via digital mediums like mobile phones and computers. Critical operators in the DFS ecosystem include mobile network operators, banks, regulators, and financial technology providers.



However, rural communities face challenges in accessing financial services due to high operational costs, lack of infrastructure, and limited financial inclusiveness. Digital finance technologies can bridge this gap by providing financial services without the need for physical bank visits.

Despite the benefits, digital finance providers may prioritize high- and middle-income customers, leaving low-income and rural communities with limited access to financial services. This highlights the need for a more inclusive approach to digital finance that addresses the unique needs of rural communities and promotes financial inclusion.

The study aims to evaluate the impact of digital finance on agribusinesses in Nigeria, identify challenges, and propose solutions to promote financial inclusion and agribusiness development.

This research has the primary objective of investigating the impact of digital finance technologies on agribusiness in Nigeria. The specific goals are:

1. To examine the impact of point-of-sale payment system (PPS) on credit to the agricultural sector in Nigeria.
2. To ascertain the impact of mobile money payment system (MPS) on credit to the agricultural sector in Nigeria.
3. To investigate the impact of automated teller machine payment system (APS) on credit to the agricultural sector in Nigeria.

Stemming from above, the study hypothesizes thus:

H01: Point of Sales Payment System has no significant impact on credit to Nigeria's agricultural sector.

H02: There is no significant impact of the Mobile Money Payment System on credit to Nigeria's agricultural sector.

H03: Automated Teller Machine Payment System has no significant impact on credit to the agricultural sector in Nigeria.

## **REVIEW OF RELATED LITERATURE**

Concepts of digital finance

Digital finance refers to financial services delivered through digital channels like computers, mobile phones, the internet, or bank cards. It enables individuals to access financial services, make payments, and manage finances digitally. Innovations in digital payments include:

1. Wrappers: linking traditional payment systems to digital platforms
2. Mobile money systems: enabling payments and transactions via mobile phones
3. Local digital currencies: promoting local spending and exchange
4. Digital currencies (cryptocurrencies): secure, decentralized payment mechanisms

The benefits of digital finance include:

1. Financial inclusion: increasing access to financial services for the unbanked
2. Cost reduction: efficient payment systems save time and money
3. Control: enabling senders to influence how recipients use funds
4. Savings: automatic deposits and reminders promote savings
5. Risk management: digital payments provide a safety net during income shocks
6. Speed: rapid delivery of funds, especially during emergencies



## 7. Security: digital payments reduce the risk of physical cash transactions

### Theoretical review

This study anchors on the financial innovations theory but still attempts to discuss a few approaches relevant to digital finance technologies.

### Theory of financial innovations

The theory of financial innovations proposed by Silber (1983), suggests that financial innovations arise from the expansion benefits of money-related businesses. The theory identifies factors driving innovations, including weaknesses in the financial sector, high operational costs, and exchange costs. Financial innovations can lead to better economic performance, increased liquidity, and improved competitiveness.

### Technology Acceptance Model (TAM)

The TAM, proposed by Davis (1986), explains the attitude needed to drive the adoption of new technology. The model focuses on two factors:

1. Perceived Ease of Use (PEOU): the level of difficulty in using a new system
2. Perceived Usefulness (PU): the utility of a new system

TAM suggests that a system's actual use is influenced by users' behavioral intentions, which are shaped by their perceptions of the system's ease of use and usefulness. The theory is essential for understanding consumer behavior variations, especially in digital financial services.

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### Empirical review

This section examines various studies on digital finance, financial inclusion, and economic growth. Ugwuanyi et al. (2020) investigated the impact of digital finance on money supply in Nigeria from 2008 to 2019. The study used descriptive statistics, correlation analysis, and ARDL Model, finding a positive influence of digital finance on money supply.

Dabla-Norris et al. (2015) explored three measures of financial inclusion - access, depth, and intermediation productivity - across six countries. The study revealed varying effects of financial inclusion on economic growth across countries.

Akhisar et al. (2015) analyzed the efficiency of electronic banking services in 23 developed and developing countries. The study found that bank efficiency was influenced by the ratio of branches to ATMs and was critical for successful electronic banking adoption.

Ranjani and Bapat (2015) examined whether individuals with access to credit sources use financial services effectively. The study found that having a bank account did not necessarily lead to



financial inclusion. Monyoncho (2015) on the other hand, investigated the relationship between E-Banking advances and business performance in Kenya. The study revealed that ATM developments, Mastercards, mobile banking, and web banking improved business performance.

Terfa (2015) probed the impact of innovative financial procedures on poverty reduction in rural Nigeria. The study found that conventional product protection benefited wealthy farmers, while poor farmers lost out.

Njenga et al. (2015) examined the impact of financial developments on SACCOs' financial performance in Kenya. The study found a positive relationship between mobile banking, web banking, and SACCOs' financial performance while Bakang (2015), in a study, analyzed the effects of financial deepening on economic growth in Kenya's banking sector confirming a positive impact of financial deepening on economic growth.

Muiruri and Ngari (2014) investigated the impact of monetary advancements on Kenyan businesses. The study found that financial innovations improved business performance then Mbutor and Uba (2013) analyzed the effect of financial inclusion on fiscal policy in Nigeria and found that financial inclusion enhanced the effectiveness of monetary policy.

## METHODOLOGY

This study employed an ex-post facto research design, utilizing secondary data from the Central Bank of Nigeria Statistical Bulletin of 2020. Annualized time-series data from 2001 to 2020 were gathered, ensuring the data set was free from unit root issues by testing for stationarity using the Augmented Dickey-Fuller (ADF) test. Data was collected from the Central Bank of Nigeria Statistical Bulletin of 2020 under payment systems.

The study employed descriptive statistics, correlation analysis, and the Auto-Regressive Distributed Lag (ARDL) Model to test the hypothesis. E-view 9.0 econometric software was used for analysis.

### Model specification

The study adopted the economic model used by Ugwuanyi et al. (2020), which investigated the impact of digital finance on Nigeria's money supply. The specified econometric model is:

$$\Delta MSP_t = \beta_0 + \beta_1 \Delta MSP_{t-1} + \beta_2 \Delta APS_{t-1} + \beta_3 \Delta PPS_{t-1} + \beta_4 \Delta WPS_{t-1} + \epsilon_t + ECM_{t-1} \dots \text{equ...}(1)$$

Where:

MSP= Money Supply

APS = Automated Teller Machine Payment System

PPS = Point of Sales Payment System

WPS = Web Payment System

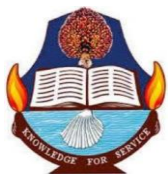
$\epsilon_t$  = Stochastic Error Term;

$\beta_0$  = Intercept for Estimation.

$\beta_1 - \beta_3$  = Coefficient of Independent Variables

$\Delta$  = change

$\sum$  = summation



P = Optimal lag

However, this study adapted the earlier model by replacing Money Supply (MSP) with Credit to Agric Sector (CAS) in Nigeria as the regressand. Additionally, the Web Payment System (WPS) was replaced with Mobile Money Payment System (MPS). Also, this study adopted a double log model. These were done to give this model variation from its adapted replica and make this study more original.

The econometric model for this study is specified as:

$$\text{LOGCAS} = \beta_0 + \beta_1 \text{LOGPPS} + \beta_2 \text{LOGMPS} + \beta_3 \text{LOGAPS} + \epsilon_i \dots \dots \dots (2)$$

Where; CAS = Credit to Agric Sector  
MPS = Mobile Money Payment System  
LOG = Logarithm  
Other acronyms in the model remain as explained above.

The apriori expectation follows that all the independent variables are expected to have a positive relationship with the independent variables in the model.

### DATA ANALYSIS AND INTERPRETATION OF RESULTS

Inferential result

Table 1: Results of ARDL model

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG(CAS(-1))	0.419651	0.204459	2.052491	0.0647
LOG(PPS(-1))	0.646562	0.254569	2.539832	0.0275
LOG(MPS)	0.093630	0.174069	0.537889	0.6014
LOG(APS(-1))	-0.622924	0.294090	-2.118143	0.0578
C	5.189335	2.294719	2.261425	0.0450
R-squared	0.948864	Mean dependent var		5.244844
Adjusted R-squared	0.920972	S.D. dependent var		0.940754
S.E. of regression	0.264464	Akaike info criterion		0.463074
Sum squared resid	0.769350	Schwarz criterion		0.809330
Log likelihood	2.832331	Hannan-Quinn criter.		0.510818
F-statistic	34.01909	Durbin-Watson stat		2.980441
Prob(F-statistic)	0.000002			

Source: Authors' analysis using E-views 9 output (2022)

The results in Table 1 indicate that the independent variables explain approximately 95% of the variations in the dependent variable (credit to agric. sector), with the remaining 5% attributed to excluded variables.

Digital finance indicators account for about 95% of the changes in Credit to Agric Sector in Nigeria.



The independent variables have the following effects on Credit to Agric Sector:

Point of Sales Payment System (PPS): a 1% increase leads to a 64% increase in Credit to Agric Sector.

Mobile Money Payment System (MPS): a 1% increase leads to a 9% increase in Credit to Agric Sector.

Automated Teller Machine Payment System (APS): a 1% increase leads to a 62% decrease in Credit to Agric Sector.

The overall model is a good fit, with:

F-statistic: 34.01909 (p-value: 0.000), indicating significance at a 5% level.

Durbin-Watson Statistic: 2.9, indicating minimized auto-correlation.

#### Discussion of findings

This study investigated the impact of digital finance technologies on agribusiness in Nigeria from 2001 to 2019. The findings show:

- i. Point of Sales Payment System positively and significantly impacted credit to the agric sector.
- ii. Mobile Money Payment System had a positive but insignificant impact.
- iii. Automated Teller Machine Payment System had a negative and insignificant impact.

#### CONCLUSION

This study examined the impact of digital finance technologies on agribusiness in Nigeria between 2001 and 2020. The results show that:

Point of Sales Payment System had a significant and positive impact on agribusiness.

Mobile Money Payment System had a positive but insignificant impact on agribusiness.

Automated Teller Machine Payment System had a negative and insignificant impact on agribusiness in Nigeria.

#### Recommendations

From the study forgone and attendant conclusion, it is recommended that:

1. Increase point of sales vendors in rural and urban areas to enhance financial inclusiveness and bring banking services closer to the people.
2. Create awareness and offer incentives for mobile money payment system transactions to significantly impact agribusiness in the long run.
3. Promote financial inclusiveness in rural and agricultural-dominated regions to increase the use of Automated Teller Machine Payment System.

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