

# Innovations

## Electronic Payment System and Economic Growth of Nigeria: 2012 – 2022

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### Abstract

*This study assessed the effect of electronic payment system on economic growth of Nigeria using secondary data sourced from Central Bank of Nigeria (CBN) Data and Statistics from 2012 to 2022. The data covered Automated Teller Machine Payments (ATMP), Point of Sale Payments (POSP) and Web Payments (WP) as the independent variables and Gross Domestic Product (GDP) as the dependent variable. Autoregressive Distributed Lag Model (ARDL) was the technique used to analyse the data collected. The result of the study indicated that long-run relationships exist between the dependent and the independent variables. The result further showed that ATMP has a significant positive effect on GDP, a variable representing economic growth. Also, POSP has a positive and significant effect on GDP. However, WP has a positive but not significant effect on GDP. Thus, the study concluded that electronic payment system has a significant positive effect on economic growth of Nigeria. The study recommended that banks should ensure that their ATM Machines are loaded with cash always to ensure that all customers desiring to withdraw funds for economic purposes succeed in making such withdrawals; Also, the Central Bank of Nigeria should regulate the charges obtained by POS operators to ensure that the costs of transactions are brought to the minimal level to encourage economic activities in the country; Finally, the network providers in Nigeria should improve the quality and coverage of their networks and also extend same to rural communities to facilitate web transactions.*

**Keywords:** E-payment System, Economic Growth, Nigeria

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## 1. Introduction

Electronic payment (e-payment) refers to the digital settlement of financial transactions. It allows individuals and institutions to carry out variety of financial transactions among themselves and with banks using automated processes and electronic devices such as personal computers, telephones, facsimiles, internet, card payments and other electronic channels. Amin, Onyeukwu and Osuagwu (2018) as cited in Andrea, Udeh and Allison (2022) defined e-payment system as an automated process of exchanging monetary value between parties involved in a business transaction and transmitting the value through the Information and Communication Technology (ICT) network. E-payment system otherwise called electronic banking (e-banking) consists of Automated Teller Machine (ATM), Point of Sale (POS), Web Payment, internet banking, mobile banking and Unstructured Supplementary Service Data (USSD). The services rendered by the system include viewing account balances, obtaining statements, checking recent transaction and making payments (Dennis & Frances, 2010). Therefore, e-banking facilitates easy and safe access to one's bank account twenty four (24) hours a day, and seven (7) days a week (Tan & Teo, 2000). In case of any complain, the customer can call customer care via the designated phone number or send email to the bank directly.

Also, e-banking enables customers to save, manage, and transact businesses that are not otherwise available to them in their locations (Karnouskos & Fokus, 2004). These services facilitated by e-banking have direct and indirect effect on the workings and growth of an economy. Apart from the advantage of decrease in expenditure, banks record increase in income due to e-banking as a result of improved account sales, wider market coverage, new fee-based income, and improved customer satisfaction (Singh, 2004). These practical advantages culminated in the adoption of e-banking in Nigeria (Odumeru, 2013).

The e-payment system, a means of achieving a cashless economy, was introduced in Nigeria by the Central Bank of Nigeria (CBN) to minimize or eliminate money laundering and terrorist financing activities including other economic and financial crimes affecting the country, improve financial service delivery, decongest banking halls, ensure 24 hours service delivery every day, facilitate tracking of transactions and online generation of account statement at will, ensure seamless international transactions and reduce the amount of cash in circulation.

Notwithstanding the advantages of e-payment system, there are some issues threatening the functioning of the system and the benefit that should be derived from the system in Nigeria, especially between 2022 and 2023 where the Central Bank of Nigeria (CBN) redesigned some of the Naira denominations, including ₦1000, ₦500 and ₦200. One of such problems is non-loading of cash in ATM machines by banks. In this case, banks refuse to load their ATM machines with cash making it difficult for customers to withdraw cash, thereby causing artificial cash scarcity. Also, the POS operators capitalised on the erroneous information of

scarcity of cash to increase charges on transactions by customers. Consequently, most traders/individuals and shop/supermarket operators prefer cash payments as against e-payments, including mobile transfer and POS. Moreover, the network for carrying out web transactions and mobile transfers using mobile banking applications is very poor in the rural areas of the country, thereby discouraging the rural dwellers from using the e-payment channels for settlement of transactions. These problems question the effect of e-payment system on economic growth of Nigeria, thereby necessitating this study. Thus, the main objective of this study is to examine the effect of electronic payment system on economic growth of Nigeria, while the specific objectives are to:

- i. Examine the effect of Automated Teller Machine Payments (ATMP) on economic growth of Nigeria.
- ii. Assess the effect of Point of Sale Payments (POSP) on economic growth of Nigeria.
- iii. Determine the effect of Web Payments (WP) on economic growth of Nigeria.

The following research questions will be answered in the course of the study:

- i. What is the extent of the effect of Automated Teller Machine Payments on economic growth of Nigeria?
- ii. To what extent is the effect of Point of Sale Payments on economic growth of Nigeria?
- iii. What is the effect of Web Payments on economic growth of Nigeria?

The following research hypotheses were stated to guide this study:

H<sub>01</sub>: There is no significant positive effect of Automated Teller Machine Payments on economic growth of Nigeria.

H<sub>02</sub>: There is no significant positive effect of Point of Sale Payments on economic growth of Nigeria.

H<sub>03</sub>: There is no significant effect of Web Payments on economic growth of Nigeria.

This study covered 2012 – 2022. The independent variables used include Automated Teller Machine Payments, Point of Sale Payments and Web Payments, while Gross Domestic Product was employed as the dependent variable representing economic growth.

The outcome of this study would benefit the following parties

- i. The CBN: The outcome of this study would enable the CBN appraise the benefits or otherwise of the e-payment system.
- ii. Researchers: This work would serve as a reference material for further studies on issues of e-payments and the growth of Nigerian economy.

- iii. Lecturers/Students: The outcome of this research work would be a good study material for both staff and students of Banking and Finance, Economics, Business Administration and other related courses.

## **2. Literature Review**

### **2.1 Conceptual Review**

#### **2.1.1 Overview of Electronic Payment System**

Electronic payment system refers to financial services delivered via digital infrastructure platform including mobile phones and internet with little or no use of cash and traditional bank branches (Zwingina, Onoh & Ezechi, 2023). The payment system comprises of institutions, instruments, rules, procedures, standards and technical means designed to make possible the transfer of financial value between parties involved in a transaction. Electronic payment system guarantees the security of cash and the safety of the owners (bank customers) as it does not involve the handling of physical cash. It involves the participation of different players such as banks/financial institutions, financial technology (FinTech) providers, mobile network providers, regulators, agents/financial retailers and clients. E-payment system requires improved internet network to work smoothly. It provides the means to overcome obstacles associated with payments and other financial transactions executed outside the banking hall through electronic platforms, and can contribute to national economic growth and financial inclusion (Asian Development Bank, 2016).

The rapid growth in Information and Communication Technology (ICT) across the world has caused a change in the payment system for business transactions as the narrative has changed from the traditional payment system to electronic payment system. E-payment system is used in place of cash in settlement of transactions and it makes it easier for both the buyer and the seller to trade in a safe and secure environment (Afaha, 2019). Also, the e-payment system ensures that most of the money in circulation in the country are with banks; It facilitates tracking of transactions/spending and makes it easy to generate data for research and policy/decision making.

As a disadvantage, the e-payment system facilitates Advance Fee Fraud (419 or scam). Despite the establishment of the Economic and Financial Crimes Commission (EFCC), Independent Corrupt Practices and other Related Offences Commission (ICPC) and even the Cyber Crime Unit (CCU) of the Nigeria Police Force (NPF), the incidences of fraudsters using e-payment channels for their activities are increasing. Another disadvantage of the e-payment system is the overdependence on network availability and strength. For the e-payment system to be effective, there must be a good/quality network.

For a person to use the e-payment channels, such a person must be a customer of a bank who has an active account (savings, current or fixed deposit account) with a bank or FinTech providers and the account must be adequately funded. In the case of banks (with branches), the customer has to sign up for e-payment system

to be able to make transactions electronically. However, in the case of FinTechs (without branches), all the procedures from opening of account, funding the account, making payments and even borrowing money are done online using personal computers or mobile phones.

Government has instituted a number of systems to facilitate secure interbank settlement and fund dispensation to individuals. The structure put in place to ensure smooth e-transactions include the Nigerian Interbank Settlements System (NIBSS); the Society of Worldwide Interbank Financial Telecommunication (SWIFT), of which Nigeria is a member; Nigeria Interbank Settlement System Instant Payment (NIP); Automated Teller Machine (ATM); Point of Sale terminals (POS); and Unstructured Supplementary Service Data (USSD), amongst others.

FinTech companies facilitate financial transactions 24 hours a day 7 days a week (24/7). All FinTech services are provided online and most of them have mobile applications through which customers can have access to their services. Their services include: opening of account, acceptance of deposits via transfer from other bank accounts, making payments, facilitating savings and investments, checking account balance and generating account statement, monitoring transactions and lots more. Examples of FinTech companies include OPay, MoniPoint, FairMony, OKash, JumiaPay, Palmpay, Paga, etc. Also, there are switching companies such as Paystack, Interswitch, Remita, eTranzact, etc. Also involved in the e-payment process are the card companies including MasterCard, Visa, Verve, etc

The growth in electronic payments has triggered online fraud. The e-payment channels such as computer/web, mobile and Point of Sale (POS) have been targeted by fraudsters. For instance, between the second quarter of 2022 and the second quarter of 2023, over 10,098 fraud cases involving ₦1.95 billion were recorded on POS channels. Also, 34,772 computer based fraud cases involving ₦18.97 billion were recorded in the time under review. Concerning mobile payment channel, 33,714 cases involving ₦6.48 billion were recorded (Jaiyeola, 2023).

### **2.1.2 The Concept of Economic Growth**

Economic growth is an increase in economic goods and services produced by a country in one period of time (usually a year) compared to a preceding period. Economic growth can be measured in nominal or real terms. The nominal measure takes into account the current price of goods and services while the real measure is adjusted to remove inflation. Usually, economic growth is measured with Gross Domestic Product (GDP) or Gross National Product (GNP).

Gross domestic product (GDP) is the total monetary or market value of all the finished goods and services produced within the territory of a country in a specific time period (Azeez, 2011). As a true measure of the general domestic production, it shows the health of a country's economy. The calculation of a

country's GDP includes all private and public consumption, government expenditure, investments, additions to private inventories, paid-in construction costs, and the foreign balance of trade (Isibar, 2018).  $GDP = C + I + G + X$  where C = Consumption (private consumption expenditures by households and non-profit organisations), I = Investment (business expenditures by business organisations and home purchases by households), G = Government Spending (expenditures on goods and services by the government) and X = Net Exports (the nation's exports minus imports). The equation is known as expenditure approach as all the three variables on the right hand side of the equation indicate expenditures by different groups in the economy.

Gross National Product (GNP) is the total value of all finished goods and services produced by the citizens of a country either resident at home or abroad, or a country's businesses/investments whether located in the domestic economy or overseas. While GDP is limited to the geographical borders of a country, GNP takes into account the net economic activities performed by its citizens and entities irrespective of the location (home and abroad). In the computation of GNP, government expenditure, personal consumption expenditure, private domestic investments, net exports and income earned by nationals overseas are added, while the income earned by foreign nationals resident in the domestic economy is subtracted. Furthermore, GNP does not capture the value of intermediary goods to avoid double counting as the values of such goods are included in the value of final products and services. Thus,  $GNP = C + I + G + X + Z$ , where C is Consumption, I is Investment, G is Government, X is net export and Z is net income earned by domestic residents from overseas investments minus net income earned by foreign residents from domestic investments.

## **2.2 Theoretical Framework**

### **2.2.1. Theory of Financial Innovations**

The theory of financial innovations which anchors this work was proposed by Silber in 1983. The theory is premised on the idea that benefit expansion of money related foundations is the key reason of financial inclusion (Li and Zeng, 2010). The theory affirms that the main thoughts behind the new innovations are the defects of the money related business sector, mostly the deviated data, office expenses and exchange costs (Błach, 2011). The theory further explained that financial innovation is an important motivating factor for the financial system, which results in better economic productivity and enhanced economic benefit derived from the new and frequent changes (Sekhar, 2013).

Financial innovations imply new techniques of production, technological solutions, resulting in a higher rate of return, therefore enhancing the growth of the economy as a whole. The theory maintains that the innovativeness improves the firms' competitive advantage and generates more earnings to the investors (Błach, 2011). Sekhar (2013) opined that the application of innovations promotes growth of financial institutions through improved allocation, efficiency and a

reduction of financial and administration costs. Blach (2011) added that financial innovations boost financial markets liquidity and ensure the allocation of resources to areas of need as well as improve accessibility to emerging prospects, hence deepening financial inclusion.

### **2.2.2 Financial Intermediation Theory**

The financial intermediation theory was propounded by Gurley and Shawin 1967. The theory explains the process of mobilising funds from the surplus unit of the economy to the deficit unit of the economy for business and investment purposes. It underscores the responsibility of bank credit in an economy. According to the theory, the business of financial intermediation in any modern economy is to provide a mechanism to draw financial flows from financially exceeding agents to those having a financial need in the economy. This means that a financial institution can affect private sector growth by efficiently carrying out its functions, among which is the provision of credit.

Intermediation is the process whereby potential borrowers are brought together with potential lenders by a third party, the intermediary. Financial institutions, in intermediating between the surplus and the deficit units bring sustained economic development. The role of financial intermediaries includes risk reduction, aggregation, maturity transformation and financial intermediation. By lending to a wide variety of individuals and businesses, financial intermediaries reduce the risk of a single default resulting in total loss of assets. By pooling many small deposits, financial intermediaries are able to make much larger advances than would be possible for most individuals. Most borrowers wish to borrow on long-term whilst most savers are unwilling to lock up their money for the long-term. Financial intermediaries, by developing a floating pool of deposits, are able to satisfy both the needs of lenders and borrowers.

### **2.3 Empirical Review**

Ehiedu, Onuorah and Chiejina (2023) studied the effect of e-payment system (EPS) on the efficiency of banks in Nigeria. The specific objectives of the study include: to determine the implication of mobile payment, Automated Teller Machine (ATM) and POS on the efficiency of Nigerian banks. The data for the study were sourced from Central Bank of Nigeria (CBN) covering 2012 – 2016 and a linear regression technique was employed in analysing the data using Statistical Package for Social Sciences (SPSS). The result of the analysis showed a P-value of 0.333 which connotes that there is no significant effect of EPS on the efficiency of banking in Nigeria. The study recommended that Banks and other financial institutions should intensify efforts in mounting other e-payment channels to promote trade and commerce in Nigeria and the CBN should embark on intensive campaign for complete adoption of e-payments products especially at the grassroots.

Zwingina, Onoh and Ezechi (2023) examined the impact of electronic payment systems on economic growth in Nigeria using data spanning 2009 – 2018. Descriptive statistics, Unit Root test, correlation analysis and Autoregressive Distributed Lag (ARDL) Model were used for the analysis. The result of the unit root test (diagnostic test) suggested that the variables were a mixture of 'I0' and 'I1'; as such, ARDL model was used. This study employed automated teller machine (ATM) payment system, point of sales (POS) and web payment system as proxies for electronic payment systems (independent variables), while real gross domestic product (RGDP) was employed as a measure of economic growth (dependent variable). Data were collected from Central Bank of Nigeria (CBN) Statistical Bulletin of 2018, under payment system statistics. The result of the ARDL model revealed that ATM, POS and Web Pay have a positive but not significant impact on RGDP. The study concluded that electronic payment system impacted positively on economic growth in Nigeria.

Andrea, Udeh and Allison (2022) examined the effect of e-payment systems on gross domestic product of Nigeria. Specifically, the study was set to determine the effect of Automated Teller Machine (ATM) payment system, Point of Sale (POS) payment system and mobile applications payment system on gross domestic product in Nigeria. The study adopted ex-post facto research design. The population comprised of all the quoted telecommunication companies listed on Nigeria Stock Market as at 2020 while the sample size comprised of MTN Nigeria, eTranzact, Chams Plc, Courteville Business Solutions Plc and Omatek Plc. Judgmental sampling technique was used in selection of the sample. Autoregressive Distributed Lag Model (ARDL) was used as the analytical technique. The study revealed that ATM payment system, Point of Sales (POS) payment system and mobile applications payment system have significant effect on economic growth in Nigeria. The study recommended that banks should constantly upgrade their hardware and software whenever a new feature of enhancing security becomes available.

Mohammed and Salihu (2021) investigated the impact of electronic money transaction on private sector credit growth in Nigeria using annual data from 2009 to 2020 sourced from CBN Statistical Bulletin. Johansen co-integration, causality test and Ordinary Least Squares (OLS) regression techniques were employed to test the long-run causality between electronic money transaction, automated teller machine (ATM), point of sale (POS), internet banking (INT) and value of cheques (VOC) in relation to electronic money transaction. The result shows that ATM, POS and INT have a positive and significant impact on electronic money transaction which in turn translates to economic growth. However, the result of VOC is not statistically significant at 5%. The study reveals that all the variables are stationary at first difference  $I(1)$  of conducting a unit root test. Therefore, the study found a positive and significant impact of electronic money transaction on private sector growth in Nigeria. This study concludes that electronic money transaction contributes immensely to private sector growth in Nigeria. Based on

this finding, it was suggested that policy measures should focus more on stimulating the services of point of sale, internet banking, enhancing automated teller machines, improve on the value of cheques and other monetary policies for rapid private credit growth in Nigeria.

Chiejina (2021) examined the effect of the e-payment system on the efficiency of banks in Nigeria. The specific objective of the study is to examine the impact of e-payment systems on economic growth in Nigeria; to determine the implication of mobile payment on the efficiency of Nigerian banks; to identify the significance of Automated Teller Machine on the efficiency of Nigeria banks; and to determine the effect of POS on the efficiency Nigerian banks. The data were sourced from Central Bank of Nigeria E-payment Statistics spanning 2012 - 2016. A linear regression analysis was adopted for this study using SPSS. The result of the analysis obtained a P-value of 0.333 which connotes that there is no significant effect of e-payment system on the efficiency of banking in Nigeria. The study recommended that banks and other financial institutions should intensify efforts in mounting other e-payment channels to promote trade and commerce in Nigeria and the Central Bank of Nigeria should embark on an intensive campaign for complete adoption of e-payment products especially at the grassroots.

Oyelami, Adebisi and Adekunle (2020) investigated the determinants of electronic payment adoption and the role of electronic payment on consumers' purchase decisions as well as its effects on consumers' spending growth in Nigeria. Both primary and secondary data were deployed. The primary data were collected through a cross-sectional survey of banks' customers who have experienced the e-payment modes in Lagos state, Nigeria. The questionnaire was designed in-line with Likert scale and validated. Fifty copies of the questionnaire were piloted. The copies retrieved were subjected to Cronbach Alpha test of reliability. All the six variables were found to be reliable ranging between 0.725 and 0.828 Cronbach alpha values, which are within the acceptable limit. The sample size for this study, as determined through Cochran formulae is 384. In like manner, the instrument of data collection was administered on 420 respondents by using the multistage sampling technique to sample respondents across five divisions (locations) of Lagos. The data retrieved were analysed using descriptive (frequency and percentage) and inferential statistics (Pearson correlation, hierarchical regression analysis and analysis of variance). The results revealed that there is a positive and significant relationship between electronic payment systems determinants (convenience, security and safety, trust, social influence) and e-payment adoption in Nigeria. These variables accounted for more than half (3/5) of what influences consumers' adoption of e-payment mode of transaction in Nigeria. The results from the estimations show that factors such as educational attainment, financial inclusion, income level, internet service availability and other financial infrastructures such as point-of-sale machines and mobile banking services are critical determinants of e-payment adoption in Nigeria. The results

also indicate that electronic payment influences consumers' purchase decisions and thus increasing consumers' spending growth in Nigeria. The policy implication advanced by this study is that the Nigerian government can leverage on electronic payment to increase consumers' spending and thus improve aggregate demand which will consequently stimulate investment and economic growth in the country.

Njoku, Nwadike and Azuama (2020) examined the impact of electronic banking on economic growth in Nigeria over the period of 2009 – 2018 using quarterly data. Secondary data were collected from the CBN Statistical Bulletin and the Nigerian Bureau of Statistics so as to establish the relationship between the dependent variable (Real GDP) and the independent variables (Automated Teller Machine, Point-of-Sale, Internet Banking and Mobile Banking). The research adopted the Vector Error Correction Model (VECM) and the results of the analysis showed that electronic banking has significantly impacted on economic growth of Nigeria. The VECM result showed that R-square( $R^2$ ) is 0.5897, which shows that the independent variables in the model used explain 58.97 percent of the total variations in economic growth during the period of the study, while 41.03 percent is explained by variables not included in the model. The result of the analysis shows that Electronic Banking has a significant relationship with Nigeria's economic growth, while Point of Sales, Internet Banking and Mobile Banking, individually have no significant effect on Nigeria's economic growth, except Automated Teller Machine which has a significant effect on economic growth in Nigeria for the period under consideration. The research recommended that the government should reduce the charges on the use of electronic means of transactions so as to encourage people to use them more often.

Nelson (2020) examined the effect of payment system on economic growth of Nigeria from 2014-2019. Quarterly secondary data sourced from CBN Statistical Bulletin were used in the study and GDP was employed as the proxy for economic growth while the value of transactions for Cheque, Automated Teller Machine, NIBSS Instant Payment (NIP) and Remita were used to represent payment system. The study adopted ex post facto research design. Analysis of the data were carried out using regression and ANOVA techniques with the aid of Statistical Package for Social Sciences (SPSS). Findings from the study revealed that there is a significant relationship between gross domestic product (GDP) and all the four selected payment systems (Cheque, ATM, NIP and Remita) with a p-value of 0.000 respectively. Conclusively, the study posits the payment system has a positive effect on economic growth of Nigeria. Thus, it was recommended that a nationwide rural enlightenment and awareness programme on the use of the various payment systems should be organised if the CBN wish to eradicate the patronage of the cash-based system. It is also recommended that there should an upgrade in the security pass required for online transactions to curtail the increase in fraudulent activities popularly known as "Yahoo – Yahoo".

John (2019) assessed the relationship between electronic payment (e-payment) systems and economic growth in Nigeria. Monthly data for Nigeria covering the period 2012-2017 on values of various payments systems were sourced and analyzed using Autoregressive Distributed Lagged (ARDL) regression method. The result indicates a significant positive relationship between the electronic payment system and economic growth in terms of real gross domestic product (GDP) growth. Automated teller machines have a positive and significant impact on economic growth, based on a probability of (0.06), but its contribution to the real GDP growth is negative (-5.0 percent). This means the ATM based transaction encourages more cash, possessions and may not yield the required goal of low cash based transactions within Nigeria's banking populace. POS contributes 17 percent growth to the real GDP growth in Nigeria, web based transactions (WBT) contributes 2.3 percent to the real GDP growth, but INTERBANK transactions has an insignificant impact on GDP growth.

Andabai and Bina (2019) assessed the impact of e-banking on economic growth in Nigeria for the period 2000-2018. Secondary data were used and collected from Central Bank of Nigeria Statistical Bulletin. The study used Gross Domestic Product as proxy for economic growth, the dependent variable; while electronic mobile payment (EMP) and automated teller machine (ATM) were used to measure e-banking. Hypotheses were formulated and tested using Ordinary Least Square (OLS). The study shows a significant impact of automated teller machine transaction on Gross Domestic Product in Nigeria. Electronic mobile payment has a significant impact on Gross Domestic Product in Nigeria. The coefficient of determination indicates that about 47% of the variations in economic growth can be explained by changes in e-banking variables (ATM, EMP) in Nigeria. The study concludes that e-banking has a significant impact on economic growth in Nigeria. The study recommends that the banking industry should adjust to full and effective deployment of information technology due to its perceived advantage. That bank should be able to provide security physically and electronically to check the incidence of hacking by fraudsters. That banks' management should from time to time train customers with regard to electronic banking, its benefits, risk exposure, physical and electronic security to avoid financial loss in the hands of hackers. It is also recommended that the monetary authorities and commercial banks enlighten their customers on the convenience and importance of adopting mobile banking channel in completing their transactions.

Ene, Abba and Fatokun (2019) assessed the impact of electronic banking on financial inclusion in Nigeria. The study used the total number of automated teller machines and point-of-sale devices in Nigeria as proxies for electronic banking and the proportion of banked adult population to total bankable adult population in Nigeria as proxy for financial inclusion. The study adopted ex-post facto research design and multiple regression analysis. It was observed that automated

teller machines do not significantly impact financial inclusion while point-of-sale devices significantly impact financial inclusion in Nigeria. In line with the findings of the study, it was recommended that deposit money banks should remove the bottlenecks associated with the use of their automated teller machines and strive to meet international best practice. Also, more point-of-sale devices should be readily available and easily accessible by customers.

Ekechukwu and Mbah (2019) investigated the impact of e-banking on Nigeria's economic growth between 2008 and 2018. The study examined the impact of mobile transfer; Point of Sale (POS); and Automated Teller Machine (ATM) on economic growth. Expostfac to research design was adopted and the data was generated from Central Bank of Nigeria's Statistical Bulletin from 2008 to 2018. Augmented Dickey-Fuller nit Root test statistic, Error Correction Model, Heteroscedasticity test, and Durbin-watson tests were used to analyse the data. The result of the analyses reveals that both Mobile Transfer and Point of Sales (POS) have a negative impact on the Real Gross Domestic Product (RGDP); while the Automated Teller Machine (ATM) exhibited strong positive impact on Real Gross Domestic Product (RGDP).

Oniore and Okoli (2019) assessed the impact of electronic banking on the performance of money deposit banks in Nigeria from 2006 to 2017 using time series quarterly data. The study adopted Ordinary Least Squares as main tool of analysis. The estimated regression equation showed that in the long-run, all the variables are correctly signed, except inter-bank transfer that is negatively signed. The policy implication of the findings is that e-banking has gradual positive impacts on performance of banks in Nigeria and hence could contribute to the process of economic growth. The research therefore suggested that banks must be focused in terms of their needs and using the right technology to achieve goals and objectives.

Isibor, Omarkhanlen, Okoye, Achugamonu, Adebayo, Afolabi and Ayodeji (2018) studied the impact on both customers' satisfaction and economic growth. The methodology employed for testing the hypotheses is a statistical parametric test called Pair Sample t-test through the use of SPSS statistical package. The study rejects both null hypotheses which mean that e-banking has improved both customers' satisfaction and caused economic growth in Nigeria. The study recommended adequate legislation on all aspects of e-banking so that both the operators of the system and the public can be adequately protected. Also, banks should charge low or no fees for e-banking services in order to motivate their customers to take advantage of their e-banking services.

Oluma, Abdullahi and Madu (2016) evaluated the implications of electronic banking on selected businesses in Nasarawa state, Nigeria. The objective of the study is to examine the extent to which e-banking operations affect the service delivery of selected businesses in Nasarawa state. This study adopted Chi-square statistical technique in the analysis of data. The test of hypothesis has shown a

significant relationship between electronic banking platform and the performance of businesses in the state. It was concluded that most of the respondents agreed that the e-banking system adopted by deposit money banks in Nigeria have improved tremendously the performance of their businesses in terms of efficiency in conducting business activities. We recommended that the deposit money banks should expand on the number of Automated Teller Machine (ATM) to improve the quality of services rendered to allow the customers offset their bills and enhance business transactions.

Joseph and Richard (2015) evaluated the adoption of e-payment system in Nigeria: its economic benefits and challenges. Qualitative research design was adopted and the study explained that the internet has really facilitated the growth of electronic transactions. Consumers could purchase goods and services through the internet and send unencrypted credit card numbers across the network, which did not provide much security and privacy. But a wide variety of new secure network payment schemes have been developed as consumers became more aware of their privacy and security. The study affirmed that the benefits of e-payment are unquantifiable in that it would galvanize Nigeria into a cashless society and eliminate fear of the unknown. Though e-payment is faced with challenges, like public acceptability, lack of uniform platform operated by the banks, lack of adequate infrastructure and issues of security, with proper use of e-payment system, corruption which is a cancer in government arena will be holistically addressed.

Oyewole, El-Maude, Abba and Onuh (2013) explored the relationship between e-payment system and economic growth as a means of reviewing current transition to cashless economy in Nigeria. Data were analysed using OLS and TSLS methods covering period of 7 years (2005-2012). The result indicates a significant positive relationship between e-payment system and economic growth in term of real GDP per capita and trade per capita. Only ATM payment channel was found to positively contribute to economic growth while other e-payment channels contribute negatively. Hence, current cashless policy should be tailored towards effective e-payment system and other factors which bear much relevance on successful transition to cashless economy should be prioritized.

### **3. Methodology**

This research work adopted Ex Post Facto research design. This research design is a method in which independent variables that already exist are compared on some independent variable. The design became suitable as the variables and data used in this study already existed and not under the control of the researcher to manipulate. The data for the study were sourced from Central Bank of Nigeria Statistical Bulletin 2022. The data were sourced on Automated Teller Machine payments, Point of sale payments, Web Payments and Gross Domestic Product from 2012 to 2022.

The population of the study consists of all ATM payments, Point of Sale transactions and Web payments in Nigeria between 2012 and 2022. The Autoregressive Distributed Lag Model (ARDL) was adopted to estimate the effect of the independent variables on the dependent variable. This study used a modified version of the model of Oniore and Okoli (2019). The model of Oniore and Okoli (2019) is stated as follows:

$$ROA = f(ATM, IBT, POS)$$

Where:

ATM = total transactions carried out on the automated teller machines

IBT = Inter-bank transfer is regarded as the transfer between two banks.

POS = Total number of POS transactions.

ROA = Return on Assets of Banks.

Thus, the model for this study is specified as follows:

$$GDP = f(ATMP, POSP, WP) \quad - \quad - \quad - \quad - \quad - \quad - \quad (i)$$

$$GDP = a_0 + a_1ATMP + a_2POSP + a_3WP + e \quad - \quad - \quad - \quad - \quad (ii)$$

Where:

GDP = Gross Domestic Product

ATMP = Automated Teller Machine payments

POSP = Point of Sale payments

WP = Web Payments

$a_0$  = Constant

$a_1 - a_3$  = Regression Coefficients

$e$  = Error Term.

#### 4. Results of Data Analysis and Discussion

##### 4.1 Results of Data Analysis

**Table 4.1: Unit Root Test Results**

| Variable | ADF Test Statistic | Test Critical Values at 5% Level | Prob. (5%) | Stationarity |
|----------|--------------------|----------------------------------|------------|--------------|
| ATMP     | -3.996225          | -3.986225                        | 0.0535     | I(1)         |
| POSP     | -7.684738          | -2.960411                        | 0.0507     | I(0)         |
| WP       | -2.960411          | -2.960411                        | 0.0541     | I(I)         |
| GDP      | -5.583570          | -2.960411                        | 0.0001     | I(I)         |

Source: Computed by the Researcher using E-Views 9

The unit root test result presented in Table 4.1 shows mixed stationarity levels as ATMP WP and GDP are stationary at first difference while POSP is stationary at level. As such, the study employed Autoregressive Distributed Lag Model (ARDL) as the technique of estimation.

**Table 4.2: Autoregressive Distributed Lag Model (ARDL) Bounds Test Results**

|  |              |           |
|--|--------------|-----------|
| Null Hypothesis: No long-run relationships exist |              |           |
| <b>Test Statistic</b>                            | <b>Value</b> | <b>K</b>  |
| F-statistic                                      | 3.55961      | 3         |
| Critical Value Bounds                            |              |           |
| <b>Significance</b>                              | <b>I0</b>    | <b>I1</b> |
| 10%  | 2.72         | 3.77      |
| 5%   | 3.23         | 4.35      |
| 2.5%   | 3.69         | 4.89      |
| 1%   | 4.29         | 5.61      |

Source: Computed by the Researcher using E-Views 9

The ARDL result presented in Table 4.2 indicates that F-statistic of 3.55961 is higher than the lower bound at 5% level, thus signalling the existence of long-run relationships between the independent and the dependent variables.

**Table 4.3: ARDL Long-run and Short-run Coefficients**

|  |                    |                               |                    |              |
|--|--------------------|-------------------------------|--------------------|--------------|
| Dependent variable: GDP                                  |                    |                               |                    |              |
| Long-run Coefficients                                    |                    |                               |                    |              |
| <b>Variable</b>  | <b>Coefficient</b> | <b>Std Error</b>              | <b>t-Statistic</b> | <b>Prob.</b> |
| ATMP   | 0.000239           | 0.004649                      | 0.051447           | 0.0503       |
| POSP   | 0.002450           | 0.004079                      | 0.600718           | 0.0530       |
| WP   | 0.024297           | 0.029804                      | 0.026349           | 0.8305       |
| C  | 29.622944          | 15.126591                     | 1.958336           | 0.0006       |
| Short-run Coefficients                                   |                    |                               |                    |              |
| <b>Variable</b>  | <b>Coefficient</b> | <b>Std Error</b>              | <b>t-Statistic</b> | <b>Prob.</b> |
| ATMP   | 0.001846           | 0.002945                      | 0.626754           | 0.9595       |
| POSP   | 0.057285           | 0.082636                      | 0.693223           | 0.4941       |
| WP   | 0.018301           | 0.695691                      | 0.026306           | 0.9792       |
| CointEq(-1)  | -0.753206          | 0.183450                      | -4.105789          | 0.0003       |
| <b>The short-run regression dynamics are as follows:</b> |                    |                               |                    |              |
| R-squared = 0.609982                                     |                    | Adjusted R-squared = 0.528867 |                    |              |
| F-statistic = 3.126883 Prob(F-statistic) = 0.018542      |                    |                               |                    |              |

Source: Computed by Researcher using E-Views 9

Table 4.3 shows the ARDL long-run and short-run regression results. In the long-run, ATMP has a positive and significant effect on GDP. Also, POSP has a positive and significant effect on GDP in the long-run. However, WP has a positive but not significant effect on GDP. However, the short-run results indicate that all the independent variables considered in this study, including ATMP, POSP and WP have a positive but not significant effect on GDP.

The R-squared value of 0.609982 indicates that 60% of the changes in GDP are explained by the independent variables in the study. Similarly, the Adjusted R-squared shows approximately 53%. The F-statistic with a probability of 0.018542 shows that the overall regression result is significant and therefore valid.

**Table 4.4:** Breusch-Godfrey Serial Correlation LM Test Results

|             |          |              |        |
|-------------|----------|--------------|--------|
| F-statistic | 0.035025 | Prob. F(1,1) | 0.9656 |
|-------------|----------|--------------|--------|

Source: Computed by Researcher using E-Views 9

The serial correlation result presented in Table 4.4 shows that the probability of F-statistic is higher than 0.05, implying that there is no presence of autocorrelation in the analysis. This means that the results of the analysis are reliable.

**Table 4.5:** Breusch-Pagan-Godfrey Heteroskedasticity Test Results

|               |          |                     |        |
|---------------|----------|---------------------|--------|
| F-statistic   | 1.092857 | Prob. F(1,1)        | 0.3918 |
| Obs*R-squared | 6.643676 | Prob. Chi-Square(6) | 0.3551 |

Source: Computed by Researcher using E-Views 9

Table 4.5 presents the Heteroskedasticity Test Results. The results indicate that the Probability of both the F-statistic and Chi-square are higher than 0.05, meaning that the residuals have a constant variance and are therefore homoskedastic. Thus, the possibility of having porous results is eliminated.

## 4.2 Test of Hypotheses

### Hypothesis 1

Ho: There is no significant effect of Automated Teller Machine Payments on economic growth in Nigeria.

H<sub>1</sub>: There is a significant effect of Automated Teller Machine Payments on economic growth in Nigeria.

The long-run ARDL result showed that Automated Teller Machine Payments has a significant positive effect on Gross Domestic Product (GDP). As such, the null hypothesis is rejected while the alternative hypothesis is accepted.

### Hypothesis 2

Ho: There is no significant effect of Point of Sale Payments on economic growth in Nigeria.

H<sub>1</sub>: There is a significant effect of Point of Sale Payments on economic growth in Nigeria.

From the result of the study, Point of Sale Payments has a significant positive effect on GDP in the long-run. Therefore, the null hypothesis is rejected, whereas the alternative hypothesis which states that there is a significant effect of Point of Sale Payment system on economic growth in Nigeria is accepted.

**Hypothesis 3**

Ho: There is no significant effect of Web Payments on economic growth in Nigeria.

H1: There is a significant effect of Web Payments on economic growth in Nigeria.

The result of the study indicated that Web Payments has a positive but not significant effect on GDP in both long-run and short-run. As such, the null hypothesis is accepted whereas the alternative hypothesis is rejected.

**4.3 Discussion of Findings**

The findings of the study showed that Automated Teller Machine Payments has a significant positive effect on Gross Domestic Product (GDP) in the long-run. The result of this study is in-line with the findings of John (2019) and Andabai and Bina (2019) who found that Automated Teller Machine Payments have a positive and significant impact on economic growth. However, this finding is contrary to the result of Zwingina, Onoh and Ezechi (2023) who found a positive but not significant impact of ATM on RGDP.

The results of this study also found out that Point of Sale Payments has a positive and significant effect on GDP. The result of this study agrees with the results of Mohammed and Salihu (2021) who found that ATM has a significant positive impact on economic growth. However, Njoku, Nwadike and Azuama (2020) found that POS has no significant effect on economic growth in Nigeria.

This research work also found that Web Payments has a positive but not significant effect on Gross Domestic Product. The result agrees with the findings of Njoku, Nwadike and Azuama (2020) who found no significant effect of Internet and Mobile Banking on economic growth.

**5. Conclusion and Recommendations**

The study therefore concluded that electronic payment system has a significant positive effect on economic growth of Nigeria. The variables of electronic payment system considered in this study, including Automated Teller Machine Payments, Point of Sale Payments and Web Payments, exert a positive effect on economic growth. This implies that the e-payment system adopted in Nigeria promotes economic activities, encourage commerce and expansion of industries in the economy.

The study recommended as follows:

- i. Banks should ensure that their ATM Machines are loaded with cash always to ensure that all customers desiring to withdraw funds for economic purposes succeed in making such withdrawals. This would encourage the growth of the economy.
- ii. The Central Bank of Nigeria should regulate the charges obtained by POS operators to ensure that the costs of transactions are reduced to the minimal level to encourage economic activities in the country.

- iii. Network providers in Nigeria should improve the quality and coverage of their networks and also extend same to rural communities to facilitate web transactions.

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