EFFECT OF ELECTRONIC PAYMENT ON THE NIGERIAN ECONOMY

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Abstract

The objective of this paper was to determine the effect of electronic payment system on the Nigerian economy. This study adopted the ex-post-facto research design to determine the cause-effect relationship of electronic payment and the Nigerian economy. The dependent and independent variables were observed over the period, 2009 to 2020. The same data were analyzed and tested using econometric analytical technique to determine the impact of the independent variable (electronic payment proxied by ATM payment, POS payment, Web payment and mobile money transfer payment) on the dependent variable (Nigerian economy proxied by Gross Domestic Product). Data were tested using the E-view statistical software adopting the Ordinary Least Square (OLS) method on the regression model adopted. The signs and significance of the regression coefficients were relied upon in explaining the nature and influence of the independent variable on the dependent variable as to determine both magnitude and direction of impact. The hypotheses were tested at 0.05 (5%) level of significance. Results from the study revealed that automated teller machine (ATM), point of sale (POS), web payment (WEBPAY) and mobile money (MBM) payment has positive and significant impact on the Nigerian economy. Thus, electronic payment has positive and significant impact on the Nigerian economy. The study therefore concludes that, an increase in electronic payment will lead to an increase in Gross Domestic Product (GDP) and by implication economic growth. Hence, it is recommended that the Federal Government of Nigeria, through the Central Bank of Nigeria should establish policies that ensure the enhancement and sustenance of efficient electronic payment channels.

Keywords: Electronic, Payment, Nigerian, Economy

1. INTRODUCTION

The remarkable progress achieved in Information and Communications Technology (ICT) has made it possible for information to be digitalized and transmitted faster and cheaper in mega or terra bytes. Taking advantage of rapid technological progress and financial market development, a number of innovative products for making payments have been developed in recent years. Payment involves the transfer of monetary value from one person to the other, thus, a payment system consists of mechanisms, which include institutions, people, rules and technologies that make the exchange of payments possible (Johnson, 2005).

Electronic payment (E-Payment) systems refer to the automated processes of exchanging monetary value among parties in business transactions and transmitting this value over the ICT networks (Ayo and Ukpere, 2010). They are the operating procedures, information, and communication systems employed to initiate and transmit payments from a payer to a payee and for settling payments that is, transfer money (Chiejina, 2021). The E-payments channels are the apparatus used to safely and efficiently transfer monetary value in exchange for goods and services as well as financial assets (Oloruntoyin & Olanloye, 2012). E-payment could be viewed from its functions as m-payment, e-banking, e-money, online banking, internet banking, e-finance, e-broking, etc. (Amadiokoro, Ozurumba, Nwaimo, Anyanwu & Ubah (2023).

Electronic payment systems are pivotal to the digitalization of the financial system here in Nigeria, with numerous advantages ranging from financial inclusion, convenience in carrying out financial transactions to security of these transactions in a digital platform which would culminate to economic development of the economy (Zwingina, Onoh & Ezechi, 2023). Electronic payment systems services provide 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). Electronic payment systems was adopted so as to improve service delivery, decongest queues during cash payment, enable customers withdraw cash at will, aid international payment and remittance, track personal cash transaction, request for online statement, or even transfer deposit to a third party account (Isamade, Udeh & Allison, 2022).

Despite the effort of telecommunication sectors to ensure that customers reap the benefits of e-payment systems, the sector is met with complaints from customers as regards, malfunctioning Automated Teller Machines (ATMs), network downtime, online theft and fraud, non- availability of financial service, payment of hidden cost of electronic payment (E-Payment) systems like Short Message Services (SMS), for sending alerts, mandatory acquisition of ATM cards, non-acceptability of Nigerian cards for international transaction amongst others (Isamade, Udeh & Allison, 2022). Since early 2000s, the telecommunication sector has been investing in payment cards for their customers as well as deployment of ATM cards. Usage however, has been low due to lack of interconnectivity i.e. switching platform to interconnect the ATMs for card holders. Therefore, this study on the effect of electronic payment on the Nigerian economy is designed to address these highlighted issues.

Objective of the Study

The main objective of this study is to examine the impact of electronic payment systems on the Nigerian economy. The specific objectives are to:

1. Examine the effect of automated teller machine (ATM) on the Nigerian economy.
2. Determine the effect of point of sales (POS) on the Nigerian economy.
3. Assess the effect of web payment (WEBPAY) on the Nigerian economy.
4. Analyze the effect of mobile money transfer (MBM) on the Nigerian economy.

Hypotheses of the study

In line with the objectives, the hypotheses of the study are:

1. Automated teller machine (ATM) has no positive and significant impact on the Nigerian economy.
2. Point of sales (POS) has no positive and significant impact on the Nigerian economy.
3. Web payment (WEBPAY) has no positive and significant impact on the Nigerian economy.
4. Mobile money transfer (MBM) has no positive and significant impact on the Nigerian economy.

2. LITERATURE REVIEW

A number of studies have been done on electronic payment in Nigeria and outside Nigeria. Zwingina, Onoh & Ezechi (2023) investigated the impact of electronic payment systems on economic growth in Nigeria between 2009 and 2018. The study employed descriptive statistics, correlation analysis and Auto Regressive Distributed Lag (ARDL) Model to draw inference. Unit root test (diagnostic test) was carried out on the data and the results suggested that the variables were a mixture of (IO) and (I1), as such; the appropriate estimation technique to be employed was the (ARDL) Model. 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 elicited from Central Bank of Nigeria (CBN) Statistical Bulletin of 2018, under payment system statistics. The result of the ARDL Model revealed that electronic payment systems had a positive impact on economic growth in Nigeria within the period under review.

(Amadiokoro, Ozurumba, Nwaimo, Anyanwu & Ubah (2023) examined the effect of electronic payments system on the economic prosperity of Nigeria, covering a period of 12 years (48 quarters: 2009 – 2019). This was in answer to quest in some quarters on the economic implications of the electronic payment system that have garnered high popularity and massive adoption in the financial service delivery over the traditional payment system in the recent times. The study made use of secondary data with four explanatory variables (mobile payment, web payment, point of sale and automated teller machine) and one explained variable (real gross

domestic product), and the data for the study was sourced from Central Bank of Nigeria Statistical Bulletin of 2021. The Augmented Dickey-Fuller Unit Root and the Johansen Cointegration techniques were employed to test the presence of unit root and long-term cointegration in the series, while the Granger Causality technique was used to determine the presence of causal relationship among the variables. The Ordinary Least Square Regression was used to estimate the model. Findings of the study revealed that Mobile Payment and Point of Sale Service have significant relationship with economic growth of Nigeria. On the other hand, Mobile Payment has positive coefficient, Point of Sale Service and Web Pay are inversely related to the economic growth of Nigeria. In view of these findings, the study therefore recommends among others things, that the electronic payment systems should be further strengthened having shown relevance in advancing the fortunes of economic growth. The use of POS system has led to several failed and uncompleted transactions, incessantly debiting customers; hence the operational system should be strengthened for positive and efficient service delivery.

Nwankwo, Uguru & Chukwu (2022) evaluated the effect of electronic payment systems on tax revenue generation. The study specifically sought to determine the effect of automated teller machine payment, mobile banking payment, point of sales and web-transfer payment on tax revenue generation in Nigeria. Ex-post facto research design was adopted in the study and secondary data obtained from Federal Inland Revenue Service (FIRS) annual publications and National Bureau of Statistics for the years (2013-2021) was used. Analysis of data was done using descriptive statistics, unit root tests and ordinary least square regression at 5% level of significance. The outcome of the analytical tests revealed that automated teller machine payment, mobile banking payment and web-transfer payment had both positive and significant influence on tax revenue; while point of sales had positive and insignificant effect on tax revenue generation in Nigeria within the period reviewed. The implication of these findings is that the adoption of electronic payment in Nigeria has significantly influenced tax revenue generation. It was then recommended among other things that the government should invest in its internet security framework to create a firewall against fraud and instill confidence in the citizens to adopt the use of POS which would contribute to aggregate consumption and improvement in tax revenue.

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- payments 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, collating data of e-payment statistics from Central Bank of Nigeria from the year 2012 to 2016. A linear regression analysis was adopted for this study using SPSS to carry out the analysis, to obtain the P-Value significance which is given at a significance level of 0.05. The result of the analysis obtained a P-Value significance of 0.333 which connotes that there is no significant effect of the e-payment system on the efficiency of banking in Nigeria. The study recommended that banks and other financial institutions should intensity 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- payments products especially at the grassroots.

Oyelami, Adebiyi & 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. To achieve this, 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 analyzed 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 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.

Andabai & Bina (2019) investigated the impact of e-banking on economic growth in Nigeria for the period 2000-2018. Secondary data are used and collected from Central Bank of Nigeria Statistical Bulletin. The study used Gross Domestic Product as proxy for economic growth and employ as the dependent variable; while, electronic mobile payment (EMP) and automated teller machine (ATM) to measure e-banking. Hypotheses are 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 sophistication since the technology with relative perceived advantage. That bank should be able to provide security by 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, its 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.

Okifo & Igbunu (2015) studied the economic benefits and challenges of the adoption of E-payment system in Nigeria. The arrival of the internet has taken electronic payments and transactions to an exponential growth level. Consumers could purchase goods and services from 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 benefits of e-payment are unquantifiable in that it would galvanize Nigeria into a cashless society and elimination of fear of the unknown. Though e-payment is faced with challenges, like public acceptability, lack of uniform platform, being operated by the banks, lack of adequate infrastructure and issues of security; with the proper use of e-payment system, corruption which is a cancer in government arena will be holistically addressed.

Fenuga & Kolade (2010) investigated the effect of electronic payment on customer service delivery, as brought about by problem of satisfying customers need in Nigerian banks. To achieve this, four commercial banks (United Bank for Africa, First bank, Zenith bank and Intercontinental bank) in Nigeria were studied. The study design is a survey, which focused on the population of the four selected commercial banks in Nigeria. One hundred respondents were stratified proportionately amongst customers of the selected banks with the aid of questionnaire randomly administered. Chi-square and regression analysis were employed in testing whether there is significant relationship between the level of automation banking services and improvement in delivery of services to their numerous customers in Nigeria. The study concludes that electronic payment has significant impact on the services rendered by the banking industry in Nigeria thereby improves customer service delivery, better management efficiency, increased profit, customer satisfaction and sustainability in Nigeria.

3. METHODOLOGY

This study adopted the ex-post-facto research design to determine the cause-effect relationship of electronic payment and the Nigerian economy. The dependent and independent variables were observed over the period, 2009 to 2020. The same data were analyzed and tested using econometric analytical technique to determine the impact of the independent variable – electronic payment proxied by ATM payment, POS payment, Web payment and mobile money transfer payment on the dependent variable - Nigerian economy proxied by Gross Domestic Product (GDP). In line with the models adopted by Isamade, Udeh & Allison (2022) and Nwankwo, Uguru & Chukwu (2022), this study adopted multiple regression model (MRM). Consequently, the model for this study is represented as:

$$GDP = f(ATM, POS, WEBPAY, MBM) \quad - \quad - \quad - \quad - \quad - \quad 1$$

The model can thus be expressed linearly as:

$$GDP_t = \beta_0 + \beta_1 ATM_t + \beta_2 POS_t + \beta_3 WEBPAY_t + \beta_2 MBM_t + \mu_t$$

Where:

GDP_t = Gross Domestic Product

ATM = Automated Teller Machine

POS = Point of Sale

WEBPAY = Web Payment

MBM = Mobile Money Payment

μ = error term

β_0 = constant

β_1, β_2 and β_3 are coefficients

In achieving the objectives of the study, the data are tested using the E-view statistical software adopting the Ordinary Least Square (OLS) method on the regression model adopted. The signs and significance of the regression coefficients is relied upon in explaining the nature and influence of the independent variable on the dependent variable as to determine both magnitude and direction of impact. In the analysis the study relied on the following statistical tools; Correlation Coefficient (R), Coefficient of Determination (R^2), probability and the student (t) test. The a prior expectation is that electronic payment sysetm positively and significantly affects the Nigerian economy. The hypotheses were tested at 0.05 (5%) level of significance.

4. DATA ANALYSIS AND DISCUSSION

TABLE 1: Descriptive Statistics of Annual Data Series (2009 – 2020)

	GDP	ATM	POS	WEBPAY	MBM
Mean	95668.46	4283.025	965.6125	19791.85	1611.054
Median	92657.36	3825.065	380.2900	87.86500	394.4100
Maximum	154252.3	12004.10	3204.750	235617.8	9428.510
Minimum	43461.46	399.7100	11.03000	25.05000	1.270000
Std. Dev.	35167.14	3286.921	1188.113	67967.85	2853.857
Skewness	0.251343	0.925344	0.913060	3.015066	2.025219
Kurtosis	1.997989	3.511603	2.214489	10.09074	5.853870
Jarque-Bera	0.628360	1.843391	1.975869	43.32053	12.27531
Probability	0.730388	0.397844	0.372345	0.000000	0.002160
Sum	1148022.	51396.30	11587.35	237502.2	19332.65

Sum Sq. Dev.	1.36E+10	1.19E+08	15527738	5.08E+10	89589479
Observations	12	12	12	12	12

Source: Authors' E-View Computation, 2023

Table 1 presents the results of the descriptive statistics of the estimated variables of interest. GDP had 43461.46 and 154252.3 as minimum and maximum values respectively. The mean value is 95668.46 and the standard deviation is 35167.14. The implication of this is that the GDP data is moderately dispersed from its mean because the standard deviation is less than its mean value. In the same vein, the skewness of the dataset is positive and had a Kurtosis value of 1.997989; this makes the data not to satisfy a symmetrical distribution assumption because a kurtosis of less than 3 indicates that the dataset has a lighter tails than a normal distribution.

Again, ATM payment has a minimum and maximum value of 399.7100 and 12004.10 respectively. The mean value is 4283.025 which are greater than its standard deviation at 3286.921. This implies that the data is moderately dispersed from its mean. The variable data is positively skewed and with the Kurtosis value of 3.511603; this makes the data to satisfy a symmetrical distribution assumption because a kurtosis of about 3, indicates that the dataset has tails with normal distribution. This attests to the fact that ATM payment data satisfies a symmetrical distribution assumption.

Again, POS payment has a minimum and maximum value of 11.03000 and 3204.750 respectively. The mean value is 965.6125 which are less than its standard deviation at 1188.113. This implies that the data is widely dispersed from its mean. The variable data is positively skewed and with the Kurtosis value of 2.214489; this makes the data not to satisfy a symmetrical distribution assumption because a kurtosis of less than 3 indicates that the dataset has a lighter tails than a normal distribution.

More so, WEBPAY has a minimum and maximum value of 25.05000 and 235617.8 respectively. The mean value is 19791.85 which are less than its standard deviation at 67967. This implies that the data is widely dispersed from its mean. The variable data is positively skewed and had a Kurtosis value of 10.09074; this makes the data not to satisfy a symmetrical distribution assumption because a kurtosis of above 3 indicates that the dataset has heavier tails than normal distribution.

Furthermore, Mobile money (MBM) payment has a minimum and maximum value of 1.270000 and 9428.510 respectively. The mean value is 1611.054 which are less than its standard deviation at 2853.857. This implies that the data is widely dispersed from its mean. The variable data is positively skewed and with the Kurtosis value of 5.853870; this makes the data not to satisfy a symmetrical distribution assumption because a kurtosis of above 3 indicates that the dataset has heavier tails than normal distribution.

Table 2: Correlation Matrix

	GDP	ATM	POS	WEBPAY	MBM
GDP	1.000000	0.943229	0.933510	0.526581	0.808673
ATM	0.943229	1.000000	0.856042	0.741204	0.878646
POS	0.933510	0.856042	1.000000	0.490223	0.837564
WEBPAY	0.526581	0.741204	0.490223	1.000000	0.863786
MBM	0.808673	0.878646	0.837564	0.863786	1.000000

Source: Authors' E-View Computation, 2023

The correlation matrix revealed that all the independent variables (ATM, POS, WEBPAY and MBM) had a positive relationship with the dependent variable (gross domestic product). Automated teller machine payment had about 94.3% correlation with gross domestic product, point of sale payment was about 93.4% correlation with gross domestic product, web payment was correlated with gross domestic product at 52.7% and mobile money payment was about 80.9%.

TABLE 4.3: Regression Result of the effect of electronic payment on the Nigerian economy

Dependent Variable: GDP
Method: Least Squares
Date: 03/17/23 Time: 12:02
Sample: 2009 2020
Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ATM	10.78693	1.556667	6.929503	0.0002
POS	2.262421	7.067838	0.320101	0.0082
WEBPAY	0.350270	0.119244	2.937432	0.0118
MBM	7.043528	3.870235	1.819923	0.0016
C	47237.38	3699.732	12.76779	0.0000

R-squared	0.985369	Mean dependent var	95668.46
Adjusted R-squared	0.977009	S.D. dependent var	35167.14
S.E. of regression	5332.356	Akaike info criterion	20.29531
Sum squared resid	1.99E+08	Schwarz criterion	20.49736
Log likelihood	-116.7719	Hannan-Quinn criter.	20.22051
F-statistic	117.8603	Durbin-Watson stat	1.930185
Prob(F-statistic)	0.000002		

Source: Authors' E-View Computation, 2023

Table 4.3 shows that, ATM payment has positive and significant impact on the Nigerian economy (coefficient of ATM = 10.78693, t-value = 6.929503) using 2009-2020 data. The probability value of 0.0002 < 0.05 further indicates that, this is positive and significant. More so, POS has positive and significant impact on the Nigerian economy (coefficient of POS = 2.262421, t-value = 0.320101) using 2009-2020 data. The probability value of 0.00082 < 0.05 further indicates that, this is positive and significant. In the same vein, WEBPAY has positive and significant impact on the Nigerian economy (coefficient of WEBPAY = 0.350270, t-value = 2.937432) using 2009-2020 data. The probability value of 0.0118 < 0.05 further indicates that, this is positive and significant. Similarly, MBM has positive and significant impact on the Nigerian economy (coefficient of MBM = 7.043528, t-value = 1.819923) using 2009-2020 data. The probability value of 0.0016 < 0.05 further indicates that, this is positive and significant.

On the whole the coefficient of determination which measures goodness of fit as revealed by R squared (R^2) indicates that 98.54% of the variations observed in the dependent variable (Nigerian economy) were explained by variations in the independent variable (electronic payment). The test of goodness of fit of the model as indicated by R^2 was properly adjusted by the Adjusted R-Square of 97.70%. Hence, increase in electronic payment will lead to an increase in Gross Domestic Product (GDP) and by implication economic growth.

5. CONCLUSION AND RECOMMENDATION

The objective of this paper is to determine the effect of electronic payment system on the Nigerian economy. Electronic payment systems are pivotal to the digitalization of the financial system here in Nigeria, with numerous advantages ranging from financial inclusion, convenience in carrying out financial transactions to security of these transactions in a digital platform which would culminate to economic development of the economy. Electronic payment systems services provide 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.

Results from this study shows that automated teller machine (ATM), point of sale (POS), web payment (WEBPAY) and mobile money (MBM) payment has positive and significant impact on the Nigerian economy. Thus, electronic payment has positive and significant impact on the Nigerian economy. The study therefore concludes that, an increase in electronic payment will lead to an increase in Gross Domestic Product (GDP) and by implication economic growth. Hence, it is recommended that the Federal Government of Nigeria, through the Central Bank of Nigeria should establish policies that ensure the enhancement and sustenance of efficient electronic payment channels.

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