

# **Impact of Electronic Payment Systems on Nigerian Economic Development**

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## **Abstract**

*The study examines the impact of electronic payment Systems on Nigeria development. The electronic payment system is a platform that settles financial transactions between the buyer and seller. Payment system are meant to ease the stress of both parties making an easy exchange or flow of money in a safe and secure environment. This study statistically estimated the relationship between electronic (e-payment) systems and economic growth in Nigeria. Monthly available Data for Nigeria on values of various payments systems were analyzed using Autoregressive Distributed Lagged regression (ARDL) method covering the period of (2009 - 2018). 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 significant impact on economic growth, based on a the table of regression showed the Autoregressive Distributed Lag (ADRL) results obtained from the empirical analysis of the relationship between electronics mode of payment and economic growth in Nigeria. The dependent variable used is Real Gross Domestic Product (RGDP), while the independent variables are automated teller machine (ATM), Mobile Payment (MOP), Point of Sale (POS), and Web Payments (WEP). All variables were estimated using their raw state as the use of natural logarithm, run into loss of data for some variable and estimation problem. But INTERBANK transactions, has an insignificant impact on GDP growth while MOP has a negative contribution to the impact on real GDP growth. Point of Sales (POS) transactions is also the most patronized electronic banking tool and this is seen from the descriptive analysis, followed by web base transaction (WBT). POS AND WBT are significantly part of the major determining factors influencing and contributing to the real GDP growth output in Nigeria, while other variables such INTERBANK transactions are although relevant but contributes minimally and drive real GDP output negatively down, as reflected in the results. Since the successful implementation of the e-payment systems which has much to do with internet connectivity and mobile banking, efforts should be made to design or improve the internet security framework to check online fraud. There should be adequate legislation on all aspects of the operations of the e-banking and cashless system so that both the operators of the system and the public can be adequately protected.*

Keywords: Electronic Payment, Nigerian Economy, GDP Outpt

## **1. INTRODUCTION**

Years ago, a number of consumers used cash or checks to buy goods and services, with cash predominately used for smaller purchases and checks for more costly transactions. While cash remains the predominate form of payment in some places in the world, it has become a less common method of transaction as the advent of general purpose payment cards has allowed consumers and businesses to buy and sell with greater convenience. Today, consumer can make electronic payments with credit, debit and prepaid cards and more recently, using all kinds of devices, from watches to mobile phones. Greater worldwide card use raises a number of questions. Foremost, do electronic payments bring macroeconomic benefits? Moody's analytics attempted to answer this question by analyzing macroeconomic data for 70 countries/regions between 2011 and 2015. By calculating the impact of card usage on per capita consumption, Moody's Analytics was able to extrapolate the effect that the increase in spending on goods and services had on consumption and thereby GDP. In the last decade, there has been explosion of different forms of remote access to financial services, i.e., beyond bank branches. These have been provided through a variety of different channels, including mobile phones, Automatic Teller Machines (ATMs), Point-of-Sale (PoS) devices and agent banking services. In many countries, these branchless channels have made an important contribution to enhancing financial inclusion by reaching people that traditionally, branch-based structures would have been unable to reach. One of the main obstacles to financial inclusion is cost: both the cost to banks involved in servicing low value accounts and extending

physical infrastructure to remote rural areas, and the cost (in money and time) incurred by customers in remote areas to reach bank branches.

Agent banking and Mobile Payments, especially in developing economies are rapidly evolving and having tremendous impact on the economies and lives of its citizenry. In addition to reducing costs, these new service offering channels help to encourage customers to use financial services more often, as the locations are close by and in places where the customers are familiar with. In light of the aforementioned, the CBN noted the rapid growth of mobile telephony and the need to leverage existing business network infrastructure as a practical and well thought-out strategy for driving financial inclusion at the unbanked in Nigeria. In climes where Agent banking and Mobile Payments are rooted, financial institutions have successfully expanded their outreach by engaging local agents to offer their outreach by engaging local agents to offer their services. These services include: cash in/cash out, electronic transfer, bill payments, pre-approved credit lines, accounts opening, international remittances, government and other micro credit payments and other banking transactions that may be permissible by the financial institution and CBN. Nigeria began the process as far back as 2007 with the development of the Payments System Vision 2020 document, which has charted the course for the recent developments in the Payments system. Despite being the most populous African nation, Nigeria is a middle-level player in the sub-saharan financial sector and trails some its peers in African with respect to financial inclusion. As such, the CBN designed a financial inclusion strategy that is executable and achievable. In setting out the financial inclusion agenda, the Bank identified Agent Network for banking as well as mobile payments services as channels with great potential to overcome the distribution challenges and increase the use of financial services to the unbanked and under-banked. Leverage mobile payment and agent banking networks will allow financial institutions to focus on product innovation and diversification. The document provides for agent banking and by so doing, enhances the linkage of rural cooperatives to microfinance banks like it was done in Kenya.

## **2. LITERATURE REVIEW**

### **2.1 Conceptual Clarifications**

#### **2.1.1 Concept of Banking**

The traditional concept of banking activity relates to the intermediary role of banks in the mobilization of deposits and channeling same to investors. In this context, a bank may be viewed as a lawful and legal institution that accept deposits from economic agents which is repayable on demand, and also make loans available to a broad spectrum of credit-constrained individuals that require it for investment and productive uses. Specially, Businessdictionary.com defines banking as “An establishment authorized by a government to accept deposits, pay interest, clear checks, make loans, acts as an intermediary in financial transactions, and provide other financial services to its customers” (Businessdictionary.com). The notion of banking originated from England in the seventeenth century through the activities of goldsmiths who kept gold and silver bars in safe custody and in turn, issued receipts to depositors to seal the transactions. By and large, the depositors became aware that further transactions with third parties can be effected through the endorsement of receipts issued by goldsmiths. Moreover, the goldsmiths realizing that the precious metal deposits in the vaults lie idle for long periods of time therefore began the practice of creating credits through the issuance of receipts whose values exceeded vault deposits. This activity metamorphosed into the modern banking practice of today, although the current banking system is highly differentiated into commercial and other categories of banks, yet, the basic banking activity remain broadly the same. In other words, banking institutions regardless of structure in liabilities, which constitute the sources of funds and create assets as uses of funds. Bank liabilities usually include deposits, equity capital, reserves, and borrowing (for on lending). Bank’s assets include loans to individuals and businesses as well as investment in securities with high liquidity, among others (Jhinghan, 2011).

### **2.1.2 Concept of Economic Development**

It is imperative to adopt a working definition of economic development in order to better appreciate the link to the banking system. However, it is difficult to precisely define economic development which frequent result in the synonymous usage of the terms “economic growth” and “economic development” (Jhingan 2011). Regardless of this conundrum, the emerging view as a sustained rise in the aggregate output of an economy over a long period of time. Growth is more of a near-term objective with greater focus on quantity, of output rather than quality and is usually measured in terms of changes in gross domestic product (GDP). On the other hand, development connotes a longer-term agenda and its meaning has continuously been upgraded over time. Todaro and Smith (2009) provide a somewhat historical evolution on the notion of economic development which traditionally occurs when a more or less static economy experiences a sustained rise in GOP at rates of 5% and above.

Consequently, for several decades, the development policies of underdeveloped countries hinged on rapid gains in aggregate and per capita income growth failed to trickle down to the masses of the population. This resulted in widespread and escalating problem of poverty, rising unemployment and unacceptable level of income inequality. National economies grew but prosperity and the quality of life plummeted, leading to the maxim of growth without development. Therefore, in order to capture the various development desiderata, economic development has been re-conceptualized as a multi-dimensional process involving major structural, institutional and qualitative changes that expand a country’s production capabilities (economic growth), reduce income inequality and eradicate poverty (Todaro and Smith 2009). Thus, development must necessarily take place within the context of a growing economy for there to be income redistribution.

### **2.1.3 Banking System and Economic Development**

The banking system is usually the largest segment of the financial system which mobilizes domestic resources and channels it to productive investment. The vicious cycle of poverty thesis brings out clearly the potential role the banking sector could play in the process of capital accumulation and economic development. According to Nurkse (cited in Jhingan, 2011), the vicious cycle of poverty “implies a circular constellation of forces tending to act and react upon one another in such a way as to keep a poor country in a state of poverty (and underdevelopment). “For instance, low level of real income in a country results in low aggregate demand and low rate of investment which – in – turn cascades to capital deficiency, low productivity and back to low level of real income thereby completing the demand side of the vicious cycle. Similarly, the supply side of the poverty cycle in backward countries may be construed as trending from low productivity to low real income and low saving which inhibits investment and leads to deficiency of capital and ultimately back to low productivity. It is evident from the vicious cycle of poverty hypothesis that the most debilitating impediment to economic emancipation is the shortage of capital Levine (1997) and Marwa and Zhanje (2015) provide a good survey of literature on the finance (bank) growth nexus as summarized below: Bagehot (1873) shows that capital spillovers from the financial system accelerated the pace of the industrial revolution in Britain as resources were not only pooled together, but allocated to entrepreneurs with the most profitable opportunities. Schumpeter’s theory (1912) indicates that a sound credit or banking system will engender technological innovations through an efficient-allocation of resources from unproductive industrial enterprises. Inter alia, the innovative entrepreneur must have access to requisite technical knowledge and be able to implement new methods of production that will reduce cost and improves profit. To attain this goal, credit and capital from the banking system becomes imperative in providing the purchasing power to acquire new techniques, equipment and machinery which enhances capital accumulation, growth and economic development other notable works in the supply leading financial paradigm include Patrick (1966), Shaw (1973) and Mckinnon (1973).

The finance-led growth hypothesis may be further streamlines to account for the school of thought, which believes that, the importance of banking and credit system in a country depends on its stage of

development. It is believed that financial system development plays significant role in different stages of development. For instance, Schumpeter distinguished between loans that are crucial in the early stages of creating new innovations from what would be required at an advanced stage, when the excess of revenue over can comfortably finance new projects or innovations. Thus, the role of finance may become auxiliary in nature at later stages of development in the same vein, Gerschenkron (1962) avers that the degree to which financial impact on economic growth is a function of its state of development with finance playing substantial role in economically backward countries and much less in more developed nations (Marwa and Zbanje, 2015).

Claus, Lacobsen and Jera (2004) noted that the impact of the financial system and economic growth involves at least two channels capital accumulation and technical innovation. Growth is promoted via the capital accumulation channels because the banking system (BS) lowers the cost of financial intermediation, BS affect the saving decision of economic agents by making longer term investment more attractive; and by re-allocating resources to the most productive use thereby increasing the rate or return to savings which enhances capital accumulation. With regard to the innovation channel, Claus et al maintained that the financial system through diversification and specialization can promote economic growth by incentivizing small savers to invest in new, novel and innovation business ventures with high risk and returns. The second approach to examining the nexus between banking system and economic development is the demand following finance paradigm (Blum et al 2002). A useful statement in this regard is that of Robinson 1952 (cited 1997), “finance follows where enterprise leads” and this indicates that economic growth precedes financial sector development. Thus, the growth of manufacturing and other productive enterprises generates demand for expansive and new financial services that act as catalyst for banking and financial development.

The third type of casual relationship between finance and growth is captured by the interdependence paradigm (bidirectional causality). The idea is that a mutually reinforcing relationship between finance and growth exist. A well-functioning financial or banking system is expected to spur investment and boost aggregate real output while a booming economy will engender demand for more financial services (Blum et al. 2002). Furthermore, Blum et al. identified two other possible scenarios between finance and economic growth. First is that, the finance-growth link tend to be anti-developmental in times of financial crises occasioned by the activities of speculative portfolio investors who move their funds in droves at the slightest sign of down turns in developing and emerging market economies. The second scenario is that there is no link between finance and growth in the neo-classical context of zero transaction cost and perfect information (Blum et al.)

### **3. METHODOLOGY**

The study uses the National Bureau of Statistics (NBS) and the Central Bank of Nigeria as sources of information in the pursuit to emphasize the impact of electronic payment system on Nigeria economic development. Data used in the form of secondary data and in particular the following data was used; cheques, ATM, PoS, web page, Mobile pay, NIP, NEFT, M-cash, E-bill pay, Remitta, NAPS, and central pay between 2009 – 2019. The secondary data was collected from Central Bank and National Bureau of Statistics. The data collected helped answer the research. In order to measure the relationship between the adoption of e-payment systems and economic Growth, the following mathematical ARDL construct were developed:

$$RGDP = F(E\text{-payment}) \quad (1)$$

$$RGDP = F(ATM, POS, MOP, WEP) \quad (2)$$

Using equation (2) the general ARDL representation is specified as:

$$\begin{aligned} \Delta RGDP_t = & \alpha_0 + \sum_{i=1}^n \phi_i \Delta RGDP_{t-i} \\ & + \sum_{i=0}^p \vartheta_i \Delta ATM_{t-i} \\ & + \sum_{i=0}^q \sigma_i \Delta POS_{t-i} \\ & + \sum_{i=0}^k \gamma_i \Delta MOP_{t-i} \\ & + \sum_{i=0}^s \omega_i \Delta WEP_{t-i} + \pi_2 ATM_{t-1} + \pi_3 POS_{t-1} + \pi_4 MOP_{t-1} + \pi_5 WEP_{t-1} + \varepsilon_t \end{aligned}$$

Where all variables are as previously defined,  $\Delta$  is the difference operator and  $\varepsilon_t$  is the error term. To trace the existence of cointegration, F-statistic is computed from OLS regression of equation (3). The null hypothesis of no cointegration is tested by restricting the lagged level variables equal to zero i.e.  $\pi_1 = \pi_2 = \pi_3 = \pi_4 = 0 \dots$  against the alternative hypotheses that  $\pi_1 = \pi_2 = \pi_3 = \pi_4 = 0$ . The bounds tests provided two asymptotic critical value bounds. The lower bound assumes variables are  $I(0)$  whilst the upper bound  $I(1)$  variables. The null hypothesis of no cointegration is rejected if the computed F-statistic is greater than the upper critical value bound; otherwise the null hypothesis is not rejected. Based on equation (3) the following ARDL based error correction model required for the short run result is specified as follows:

$$\begin{aligned} \Delta RGDP_t = & \alpha_0 + \sum_{i=1}^n \phi_i \Delta ATM_{t-i} \\ & + \sum_{i=0}^p \vartheta_i \Delta ATM_{t-i} + \sum_{i=0}^q \sigma_i \Delta POS_{t-i} + \sum_{i=0}^k \gamma_i \Delta MOP_{t-i} + \sum_{i=0}^s \omega_i \Delta WEP_{t-i} \end{aligned}$$

Variable definitions: RGDP = Real Gross Domestic Product; ATM = Automated Teller Machine; POS = Point of Sales; MOP = Mobile Payment; WEP = Web Payments.

In order to make the data stationary, the series was differenced once.

**Descriptive Statistics**

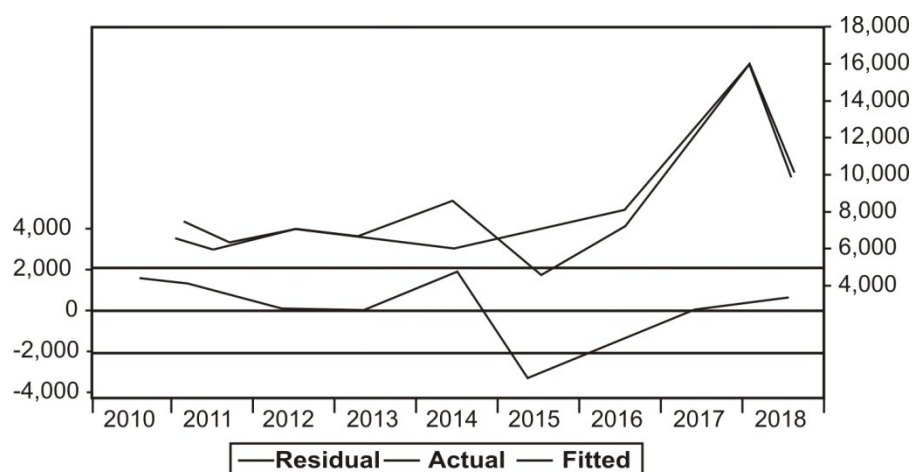
	DATM	DPOS	DMOP	DWEP	DRGDP
Mean	659.0544	263.5644	203.2700	35.60556	9275.217
Median	844.2800	236.4400	111.2900	26.72000	8733.540
Maximum	1449.460	973.3000	728.7000	220.0000	5101.340
Minimum	-148.8900	1.690000	5.380000	-59.10000	5101.340
Std. Dev.	536.4479	334.8328	234.6724	77.56074	3024.187
Skewness	-1.124013	1.275316	1.288753	1.464191	1.225245
Jarque-Bera	0.554569	2.460421	2.709945	4.527387	3.049836
Probability	0.757839	0.292231	0.257954	0.103966	0.217639
Sum	5931.490	2372.080	1829.430	320.4500	83476.95
Sum Sq. Dev	2302211	896904.3	440569.0	48125.34	73165670
Observations	9	9	9	9	9



**Regression Results**

Variable	Coefficient	Std. Error	t-statistic	Prob.
C	6940.977	1590.989	4.362681	0.0120
DATM	1.310968	1.449098	0.904678	0.4168
DPOS	21.51783	8.761801	2.455869	0.0700
DMOP	-14.24076	15.05755	-0.945755	0.3978
DWEP	-36.69025	25.67831	-1.428842	0.2263
R-squared		0.750047	Mean dependent var	9275.217
Adjusted R-squared		0.500094	S.D. dependent var	3024.187
S.E. of regression		2138.222	Akaike info criterion	18.47352
Sum squared resid		18287974	Schwarz criterion	18.58309
Log likelihood		-78.13083	Hannan-QUin criter	18.23707
F-statistic		3.000753	Durbin-Watson stat	1.689786
Prob(F-statistic)		0.156197		

**Table of Stationary**



**Correlation**

	DATM	DPOS	DMOP	DWEP	DRGDP
DATM	1	0.0203	-0.0401	-0.0192	0.3433
DPOS	0.0203	1	0.9644	0.8885	0.4854
DMOP	-0.0401	0.9644	1	0.9248	0.3129
DWEP	-0.0192	0.8885	0.9248	1	0.1493
DRGDP	0.3433	0.4854	0.3129	0.1493	1

**4. Results and Discussion**

In this study, data was collected for five years (2009 - 2018) from National Bureau of Statistics (NBS) and the Central Bank of Nigeria (CBN) to establish the impact of electronic payment systems on Nigerian economic development. The data used was collected and statistically annualized. The table of regression showed the Autoregressive Distributed Lag (ADRL) results obtained from the empirical analysis of the relationship between electronics mode of payment and economic growth in Nigeria. The dependent variable used is Real Gross Domestic Product (RGDP), while the independent variables are automated teller machine (ATM), Mobile Payment (MOP), Point of Sale (POS), and Web Payments (WEP). All variables were estimated using their raw state as the use of natural logarithm, run into loss of data for some variable and estimation problem.

The results of the ADRL regression show that at all levels of significance, the coefficients of the first and third years real GDP (lagged), POS (lagged first and third years), WEP (first and third lagged years), mobile banking payment (MOP), current and third year, and ATM lagged second period shows that they are statistically significant. This implies that point of sales transaction (POS), web pay (WEP), mobile banking system (MOP), and automated teller machine (ATM) transactions are part of the major determinant factor influencing real GDP growth output in Nigeria, while other lagged years especially the second period are not statistically significant and are less important in driving real GDP output, as reflected in our results. The R-squared shows that all the independent variables in our model explain approximately 75% of the variations in output growth per capita (dependent variable) in the period under consideration.

## **5. CONCLUSION AND RECOMMENDATION**

The analysis investigated the impact of electronic payment Systems on Nigeria economic development, taking into consideration, the PoS, ATM, MOP, Web and the GDP data available between 2009 and 2018. The study finally concluded that there is a great impact of electronic payment Systems in Nigeria economic development. However, from the foregoing the following recommendations are made:

- i. Despite the availability of electronic payment Systems solutions, cash remains dominant. This is because there are not enough POS terminals deployed.
- ii. To get people to use credit or debit cards you must get local merchants to accept it. POS terminals are now available at super markets, shops, restaurants, fast food joints, filling stations, hotels and other such places. However, a large proportion of retailers and service provided are yet to upgrade to POS.
- iii. There is also a need to educate the citizens (merchants and card holders) on the benefits of electronic payment Systems. There is also a need to educate them on how to use ATM, debit and credit cards to reduce the phobia for such technologies. Electronic transaction security education should be intensified to protect card holders.

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