Volume and Value of e-Payment System: Nigeria Banks in Perspective

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Abstract

This research paper looks at the effect of e-payment transactions employing both volume and value of digital instruments currently applicable in the Nigerian financial market using the secondary data methodology. The study aims to highlight the quantum of use both in volume and value of new technological innovation, identify areas of deficiency and offer some solutions for improvement. The study's span based on data availability is six years from 2012 to 2017. To facilitate understanding of the issue under study, the Ordinary Least Square Regression methodology was employed. Finding of the study reveals that there exist a positive relationship between value of e-payment channels and a negative relationship between volumes of e-payment channels to the percentage of financial institutions in real gross domestic product respectively. The paper concludes with a call for cooperation between government and private sector in Nigeria in order to raise the literacy level of e-payment users.

Keywords: Volume, Value, e-Payment, Banks, Nigeria
 JEL Classification: E42, G21

1. Introduction

This digital payment system has revolutionalised developments in economic activities, in financial management and in the entire global corporate operations (Slozko & Pello, 2015) by enhancing organizational performance (Ali, 2010). In most advanced countries of the world, new digital payment transaction services are emerging and are increasingly improved upon as instant replacement for cash and cheques (Bech, Faruqui, Ougaard & Picillo, 2018). Both whole and retail transaction payments are continually embracing the e-payment services which are seen to be faster, more convenient and efficient (Kung, 2018). The European Central Bank (ECB) defines e-payments as transactions made over the internet using distant payment cards, online banking instruments or e-payment providers with which the consumer has established relationships (ECB, 2010). The Committee for Payments and Market Infrastructures (CPMI) observed that, innovations in information and telecommunication technology are exerting pressure on the earlier bank-based payment services both in and across geographies (CPMI, 2015). The urge to go digital by banks,

especially using smart phones in some developing countries for example, has allowed payment systems to leapfrog those in more advanced economies (CPMI, 2016). In Nigeria as in many other developing countries, lots of financial transactions are carried out using the mobile payments stream without any recourse to bank accounts.

These e-payment transactions in banks show a shift away from cash and cheques towards a digital payment system. In Nigeria, bank customers rely more and more on e-payments using various transaction instruments such as the electronic fund transfer (N-EFT), automated payment services (N-APS), instant payment services (N-IPS), point of sale (PoS), internet based services (WEB), the automated teller machine services (ATM) and the mobile money transfer services (MMO). This reliance is due to the collaborative effort of government and the private sector in raising awareness of people on the need to go cashless in order to boost the economic output of Nigeria (Amadeo, 2018; Kabir, Saidin, & Ahmi, 2015).

1.1 Problem Statement

Despite the wide acceptance of e-payment transactions in Nigeria, only few studies are yet to pinpoint how this innovation contributes to growth of the Nigerian economy. Since banks and other financial intermediaries in Nigeria continue to adopt and embrace e-payment, there is the need to find out how the volume and values of these transactions encourage the growth of the banking industry and the Nigerian economy at large.

This study measures Nigeria's economic growth hence development by employing real gross domestic product as dependent variable while volume and value of seven e-payment instruments are the independent variables. According to Amadeo (2018), real gross domestic product is a measurement of economic output that accounts for the effects of inflation or deflation.

RGDP provides a more realistic assessment of growth than nominal GDP. Without real GDP, it could seem like a country is producing more when it's only that prices have gone up. Real GDP is an inflation-adjusted measure that reflects the value of all goods and services produced by an economy in a given year (Kenton, 2018). In other words, the overall economic indicator for the economy is the Gross Domestic Product (Wolla, 2013).

1.2 Research Objectives

The objective of this study is to assess the impact of e-payment transaction on Nigerian banks in terms of value and volume and its effects on real gross domestic product.

The study is further driven by the African Development Bank's call for African countries to strengthen their economic flexibility and drive to lift their economies to a new growth equilibrium driven by technological innovation and productivity (ADB, 2018). Moreover, the call for digital revolution in the Nigerian banking system by the apex regulatory authority (the CBN) is in the right direction and provides the much needed motivation for this study (CBN, 2011).

1.3 Research Hypothesis

H_{01}: Value of e-Payment has no significant effect on performance of the Nigerian banking industry.

H_{02}: Volume of E-Payment has no significant effect on the performance of the Nigerian banking industry.

2. Literature Review

2.1 The Evolution of Nigerian E-Payments System

According to Amudi (2015) the Nigerian payments system has evolved from manual transactions to online electronic digital system. The e-payment revolution started in Nigeria around 2007 as a response to growing internationalization of business and commercial activities using the cyber space/technology (Salawu & Salawu, 2007). Under the new arrangement, merchants do not require to display their products physically for assessment since an online store is just as efficient. Merchandise can be accessed around the world by consumers who may order goods and services by mobile technologies. New business development globally requires fast, effective, efficient, and secure settlement system (Meltzer & Marulanda, 2016). The hitherto traditional means of cash payment as medium of settlement has become almost impossible because it is ineffective and time wasting. Consequently, telecommunication companies saw an opportunity into this new profitable idea and began research to provide service solutions aimed at solving the problem. This new era in digital technology marked the beginning of Nigeria's e-payment system with the Central Bank of Nigeria ("CBN" or the "BANK"), empowered by law to serve as the overall regulator of the country's financial system.

2.2 Nigeria's e-payment Regulatory Regime

Baldwin, Cave and Lodge (2012) define regulation as formal legal rules aimed at controlling the behaviour of individual or corporate entities by state-appointed actors with the objective of benefiting the human race. Accordingly, the CBN is vested with powers to regulate matters concerning Nigeria's fiscal and monetary policies (Omotubora & Basu, 2018). Example, Section 47 (2) and (3) of the Central Bank of Nigeria (Establishment) Act (the "Act") empowers the CBN to facilitate, promote the development of effective and efficient settlement systems which include e-payment transactions (Tijjani & Ilugbemi, 2015). The Bank is also empowered to set rules and regulations for successful operations of all clearing and settlement systems. However, until quite recently, the CBN was not as technically equipped as it is today to regulate and manage electronic payment systems in Nigeria. Therefore, most of the activities in the sector were unregulated as the CBN only issued letters of authorization to companies wishing to operate payment systems in Nigeria. It was not until quite recently that the CBN began to issue circulars and guidelines on the operation of e-payment system in Nigeria. For instance, the guidelines on electronic payment of salaries; pensions, suppliers and taxes in Nigeria, guidelines on transactions switching services; guidelines on Point of Sale (PoS) card acceptance services; and regulatory framework for mobile payments services in Nigeria were all issued by the "BANK" in February, 2014 (Adu, 2016).

Furthermore, on 9th July, 2015, the CBN released an inprint titled 'sanctions on erring banks and e–payment service providers for infractions of payments rules and regulations. This guideline prescribes appropriate sanctions to e-payment operators in the Nigerian payment system for infringements. Moreover, the CBN through an exposure draft issued on 9th September, 2015, aimed to codify most of the CBN's existing guidelines on all electronic

payments system in Nigeria. This marked the beginning of Nigeria's regulatory regime on e-payment service providers in the Nigerian payments system industry such as, the card schemers, card holders, and merchant acquirers, card merchants, switching companies, payment solution system service providers ("PSSP"), issuing banks, internet service providers, Nigerian Central Switch (NCS), Nigerian Inter-bank Settlement System (NIBSS), Payments Terminal Service Aggregator (PTSA) and many others (CBN, 2012).

2.3 Objectives of Nigeria's E-payment System

It was not until 2007 that the CBN launched the e-payment system code named Vision 2020. This vision was given series of objectives to increase the resilience of the digital payment infrastructure and to encourage the usage of electronic payment methods in Nigeria (CBN, 2018). The vision 2020 is also aimed at facilitating growth in economic activities by providing safe and efficient mechanisms for making and receiving payments with minimum risks to the CBN, firms and individuals. It is further aimed at extending e-payment availability and usage to both banked and unbanked jurisdictions through service providers to end users. Nigeria's e-payment system is finally envisaged to conform to internationally accept technical, operational and regulatory standards. In the light of above objectives, the CBN began to develop the technical skills to regulate the industry by putting in place the required regulatory framework to achieve these goals. Consequently, it is now practically impossible to do anything in the Nigerian payments industry without CBN approval (CBN, 2018). The bank currently issues a Payment Solution System Service Providers ("PSSP") licence to operators of web payment portals and gateways. With this idea, the CBN aimed at bringing all participating entities in the Nigerian e-payments system within its reach for ease of supervision and control.

2.4 Advantages of Electronic Payment Systems

In this age of technological evolution, more bank customers are showing preference for virtual wallets rather than cash (Acha, Kanu & Agu, 2017). According to an online exchange market global leader (unichange.me, 2018), it is clear, electronic payment systems have a range of advantages in comparison to old banking services. These include, time saving, convenience, expense control, reduced risk of losses, low commission charges and user friendly.

2.5 Dis-advantages of Electronic Payment Systems

Mamta, Tyagi and Shukla (2016) observed that, although there are lots of advantages of the e-payment system, it never-the-less has some drawbacks which include transaction restrictions, risk of hacking, transfer between different payments systems, lack of anonymity and lack of electricity to access the internet.

2.6 Conceptual Issues in Nigerian E-payment System

The global digital technology has come up with lots of innovations and with it comes different names to identify and enhance performance of this technology driven payment instruments and services (Omotubora & Basu, 2018). Nigeria is also not left behind in such innovative concepts some of which will be explained below.

2.6.1 The Nigeria Central Switch (NCS)

The Nigerian interbank settlement system (NIBSS) also known as Nigeria Central Switch is responsible for the inter connection between various players in the financial system. This system allows the various players such as banks, mobile payment operators, non-bank financial institutions, payment terminal providers, card acquirers, government institutions and all other customers to process, send and receive funds, instruments and other documents commonly and electronically. In order to create a level playing field for all players, these switches allow both old and new players in the financial industry to seamlessly plug into the financial services sector for easy interface with their customers.

2.6.2 Nigeria Instant Payment (NIP)

Nigeria instant payment is the first and only revolutionary point to point innovative e-payment solution transfer service that guarantees instant value to beneficiary in the banking industry. This e-service system is offered in both bank branch network and mobile internet banking platforms for corporate entities and individuals. This Nigeria's internet service solution is in fact the only one in Africa and indeed, the world over (Kabir, Saidin, & Ahmi, 2015).

2.6.3 Nigeria Automated Payment Services (NAPS)

This is an integrated multi-bank payroll and bulk e-payment and e-collection platform. NAPS is designed for pension personnel records, instant processing of payroll, schedule delivery and payment, fund transfer execution, proceeds collection, direct debit and other payment instructions. This is an inter bank transaction service which came about as a result of the desire by Nigeria inter-bank settlement system (NIBSS Plc.) to strengthen, improve and enhance its bulk payment processing and operational efficiencies to its customers.

2.6.4 National Electronic Funds Transfer (NEFT)

This is an electronic funds transfer system which facilitates transfer of funds to other bank accounts across the country. This is a simple, secure, safe, fast and cost effective way to transfer funds especially for retail banking remittances. This e-payment system was first used by the reserve bank of India in 2005 (CBN, 2012). The e-digital solution was designed, established and maintained by the Indian Institute for development and research in banking technology (IIDRBT). NEFT has gained popularity among the e-payment systems in Nigeria due to its time saving and ease of transactions. Although not all banks in Nigeria use the NEFT, one of Nigeria's old generation banks-the Union Bank of Nigeria currently offers this facility to customers across branches.

2.7 Empirical Review of Literature

Prior studies in the context of e-payment system by scholars dwelled on a number of topics. For instance, Ogbeide (2019) researched on the effects of cashless policy on financial inclusion in the Nigerian emerging economy. Ailemen, Enobong, Osuma, Evbuomwan and Ndigwe (2018) wrote on electronic banking and cashless policy in Nigeria. The study by Uchechukwu, Chubuzor, Donatus and Gloria (2017) studied the effect of cashless policy on the performance of Nigerian banks from 2008 to 2015. However, Igudia in 2017 examined e-payment adoption while Shuaibu and Muhammad (2016) wrote on its challenges. Other studies by Acha *et al.* (2017); Joseph and Richard (2015); Yaqub *et al.* (2013) studied the

benefits and challenges of the e-payment system. The benefits of cashless policy to Nigerian economic development were specifically studied by Adu (2016). Further studies by Okoro (2014) examined the impact of selected e-payment instruments on the intermediation efficiency of the Nigerian economy using time series data from 2006 to 2011 and employing the multiple regression technique. Using intermediation efficiency indicators the author discovered that there was a significant relationship between ATM, PoS, Internet service values and the intermediation efficiency of the Nigerian economy. However, the study also reveals that there was no significant relationship between mobile service value and intermediation efficiency of the Nigerian economy within the period under study. However, Mago and Chitokwindo (2014) opined that the e-payment strategy has significantly affected the growth of online businesses, thereby creating diversification in the commercial industry. Moreover, Kujur and Shah (2015) considered the impediments some developing countries might face while adopting the new payment system. The authors found the likelihood of processing errors, system disruptions, fraud or other unanticipated events if such good policy was not well implemented and managed.

Chemtai (2016) posits that, the transition to electronic banking offers major opportunities in terms of innovation and competitive advantage. This initiative created an opportunity for Nigerian banks to develop a stronger business relationship with their customers. On their part, Ugwueze & Nwezeaku (2016) studied the relationship between electronic banking and the performance of Nigerian commercial banks from 2009-2013 proxy by value of Point-of-Sale transactions and customers deposits respectively. The results show that POS was not co-integrated with both the savings and time deposits but was co-integrated with demand deposits. In a study of 70 countries around the world between 2011 to 2015, Zandt (2016) reports that, Moody's analytics found electronic transactions contributing about $296 billion to global GDP and about 206 million jobs created within the same period. The study by Adesanya (2017) investigated the critical areas that could facilitate the increase in financial inclusion to all stakeholders and relative importance and the possible implications of promoting financial inclusion for monetary policy and financial stability in terms of regulation of the Nigerian banking industry and its payment system. The study found that only those who have relationship with the regulated financial players (such as commercial banks, microfinance banks and mobile money operators) are recognized as financially included. A most recent study by Mustapha (2018) relates market risk exposure of Nigerian banks due to electronic payment technology by employing the panel least square autoregressive model. Findings of the study reveled that bank performance have increased due to the adoption of the electronic payment technology.

This current study is unique in the sense that, to the best of the researcher's knowledge, it is one of the first to document e-payment system using value and volume of transactions in banks of developing economy to boost Real Gross Domestic Product (RGDP) of Nigeria.

2.8 Theoretical Underpinning
This study employs the Diffusion of Innovation Theory of Everett Rogers to explain the relationships. According to this scholar, technology adoption as an innovation involves the spontaneous spread of modern thinking (Rogers, 1995). In this theory, the existence of an innovation is seen to cause uncertainty by potential users which may imply lack of

predictability of useful information. Dearing (2009) posits that diffusion does not necessarily mean that, a new product or practice must succeed or even reach the poorest people, this study ably captures the three distinct processes of presentation, acceptance and integration needed by every new cultural element such as the e-payment system in Nigeria. This current study considers the diffusion theory as being able to explain whether or not the current innovation in the banking industry is able to give a positive push for growth in such a developing country as Nigeria.

3. Research Methodology

The methodology used in any research work is very important as it provides bedrock for the research study. This study employed published secondary data sourced from various publications of the CBN bulletin, reports published by the CBN and those of various research scholars on related topics for the period of six years from 2012 to 2017. The study further employed the filtration process to extract seven e-payment instruments out of the 12 payment systems currently used in Nigeria for the stated period (Kantudu, 2006). This is because according to the Central Bank of Nigeria (CBN) statistical bulletin, these seven e-transaction instruments are the ones in frequent use since the beginning of Nigeria's financial inclusion effort (CBN, 2011). They are hence the ones which data are readily available for this research. The population of the study which is also the study's sample size is made up of all the 21 commercial banks listed on the floor of the Nigerian Stock Exchange.

3.1 Model Specification

The Ordinary Least Square (OLS) method of regression analysis was used to specify the model for this study. The model in its structural form is stated as follows:

$$RGDP_{FI} = f(VOL_{E\text{-}PAYMENT}, VAL_{E\text{-}PAYMENT}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..\ldots 1$$

Where;

$RGDP_{FI}$ = Percentage of Financial Institutions in the Real Gross Domestic Product
$VOL_{E\text{-}PAYMENT}$ = Volume of e-payment within the period under study
$VAL_{E\text{-}PAYMENT}$ = Value of e-payment within the period under study

4. Results and discussion of Findings

This research study followed the recommendations by Zango and Idris (2018) and Jelilov and Musa (2016) in the use of ordinary least squares (OLS) regression analysis. These authors posit that the use of OLS is very common because of its peculiar properties of efficiency, minimum variance, consistency and non-biasness under the panel data estimation technique. Besides, Kilmer and Rodriguez (2016) posit that OLS is a generalized linear modelling technique for estimating relationships that may be used in both single and multiple explanatory variables because of its low measurement error.

Table 4.1: Descriptive Statistics

	Mean	Std. Dev.	Skewness	Jarque-Bera (Prob)	Observations
$RGDP_{FI}$	1700.137	147.9562	-0.633061	0.618036 (0.734168)	6
$VOL_{E\text{-}payment}$	7.22E+08	3.97E+08	1.054903	1.129202 (0.568587)	6
$VAL_{E\text{-}Payment}$	5.17E+13	2.10E+13	0.543252	0.460051	6

(0.794513)

The above Table presents the descriptive statistics for the studied variables. There is an exhibition of positive mean return for all the variables of the study. Also the sum squared deviation row which represents the net change over within the sample period of the study is positive. In terms of skewness, volume of e-payment channels and value of e-payment channels have return distribution that are positively skewed, whereas the percentage financial institutions in the real gross domestic product shows a negative skewness which implies that it has a long left tail. Finally, all the variables are relatively normally distributed as indicated by their respective *p-* values as shown by the Jarque-Bera statistics.

Table 4.2: Regression Analysis

R^2	F-Test (Prob.)	Variable	t-Test (Prob.)	Coefficient
0.7873	5.5527 (0.0980)	$VOL_{E\text{-}Payment}$	-1.6832 (0.1909)	-6.77E-07
		$VAL_{E\text{-}Payment}$	2.3409 (0.1011)	1.78E-11
		C	9.2836 (0.0026)	1270.494

Dependent Variable: RGDP$_{FI}$

The coefficient of determination with an R^2 of 0.787317 indicates that, the model is strong. This is because the analysis result shows that 79 percent of the variations noted in the contributions of financial institutions in real gross domestic product were caused by the independent variables employed in this study whereas the remaining 21 percent of the changes occurred due to other variables that were not included in this study.

Further analysis shows that the F-statistic of 5.552734and its corresponding probability value of 0.098085 of the independent variables employed in this study were not statistically significant in explaining the workings of the percentage financial institutions in real gross domestic product. These facts are explained from the *p*-values of 0.098085which is slightly greater than the 5% confidence interval. In this regard therefore, the null hypothesis is accepted. From the above analysis, the estimated form of the specified model is as below:

$RGDP_{FI} = 1270.494\text{-}6.77E\text{-}07VOL_{E\text{-}PAYMENT}+1.78E\text{-}11VAL_{E\text{-}PAYMENT}$

The regression model above shows that there is a positive relationship between the value of e-payment channels and the percentage of financial institutions in real gross domestic product. It is further found that, a negative relationship exists between the volume of e-payment channels and the percentage financial institutions in real gross domestic product. This means that a unit change in the percentage of financial institutions in real gross domestic product will cause an increase in the value of e-payment channels while it will lead to a decrease in the volume of e-payment channels by 1.78E-11 and 6.77E-07 respectively.

The t-values above show that none of the performance of the engaged independent variables were significant enough in explaining the workings of the percentage financial institutions in real gross domestic product. This is made known by all the corresponding probability values which are greater than 0.05 (that is, 0.1909>0.05 for volume of e-payment channels and 0.1011>0.05 for value of e-payment channels). However, the coefficient is statistically significant with a probability value of 0.0026 which is less than the 5% confidence interval.

4.1. Test of Hypothesis

4.1.1: First Hypothesis:

H_{01}: Value of E-Payment has no significant effect on the performance of the Nigerian banking industry.

The t-test of 2.340955 (and its corresponding probability value of 0.1011) for the value of e-payment and the contributions of the banking industry to the growth of Nigerian economy, the result shows that the value of e-payment probability of 0.1011 is greater than the 5% confidence interval, as such, we accept the null hypothesis that value of E-Payment has no significant effect on the performance of the Nigerian banking industry.

4.1.2: Second Hypothesis:

H_{02}: Volume of E-Payment has no significant effect on the performance of the Nigerian banking industry.

With the t-test of 1.683230 (and its corresponding probability value of 0.1909) for the volume of e-payment and the contributions of the banking industry to the growth of Nigerian economy, the result shows that the volume of e-payment probability of 0.1909 is greater than the 5% confidence interval, as such, we accept the null hypothesis that volume of E-Payment has no significant effect on the performance of the Nigerian banking industry.

5. Conclusions and Recommendations

The rate at which e-payment has been embraced in Nigeria is quite promising. Both private, public sectors and even individuals are increasingly employing the e-payment system. The volume and value of e-payment transactions has been growing every year. Although the use of cash is slowly decreasing, cheque usage has been coming down steadily in recent years. Indeed, even cash withdrawals at ATMs have been coming down except during the peak period of salary payment by civil servants. This study therefore investigated the effect of electronic payment platforms on payment transactions employing both volume and value of digital instruments. This was done in order to broaden the curiosity of electronic payment users and researchers in the field of finance. Findings from this study reveal that value and volume of e-payment channels have no significant effects on bank performance and impliedly real gross domestic product. This is in line with empirical evidence by Kashif and Mohammad (2016) and Uchechukwu, Chubuzor, Donatus and Ejeagbasi (2017) who independently found huge technology expenses in the books of Pakistani and Nigerian banks respectively. These findings support the diffusion of innovation theory where Dearing (2009) categorically informed that diffusion does not necessarily mean that, a new product or practice must succeed or even create value for development.

Government should continue to collaborate with the private sector for a better business landscape for everyone to enjoy the convenience and efficiency of e-payments which include simplicity, swiftness, safety and seamlessness. This study finally recommends a strong regulatory regime by government to set general standards of technical security on the e-payment system due to market constraints such as information asymmetry and other externalities which can undermine even the most effective self-regulatory regimes.

Since payment systems are the origin of central banking (Schnabel & Shin, 2018) and the channel through which technological innovation first beneficially affected the financial

sector (Volcker, 2010), a study of the impact of the ATM and PoS on trading activities in both urban and rural communities in Nigeria could be worthwhile.

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