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Electronic Payment System and Economic Growth: A Review of Transition to Cashless Economy in Nigeria

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Abstract

Technological advancement has provided efficient and effective payment system devoid of 'cash and carry syndrome'. Specifically, electronic payment system provides a medium through economic exchanges take place without visiting brick and mortal banks or with no physical presence of the transacting parties. While electronic payment system enjoys prominence in Nigeria, evidence of its contribution to economic growth has not been empirically established. Meanwhile, the current transition to cashless economy was essentially based on the prominence of e-payment system. Therefore, this study, for the first time, explored relationship between e-payment system and economic growth as means of reviewing current transition to cashless economy in Nigeria. Data was analysed using OLS and TSLS methods covering period of 7years (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 ATMs 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.

Key Words: Cashless economy, e-payment, cash-based system, economic growth.

1.0 Introduction

Today's globalization is the product of technological innovative efforts. Technological innovation has changed horizon of payment systems, drifting towards e-World (Oginni, 2013). Precisely, modern technology has changed conventional payment system into a more efficient and effective system, devoid of 'cash and carry' syndrome. The Easiness of transacting economic substances as well as a safer and quicker access to funds, among other factors, has placed e-payment system on a more glorified pace than cash-based system (Ayo, 2010; Oginni, Mohammed, El-maude & Arikpo, 2013). Interestingly, in Nigeria, e-payment system is gaining prominence to the extent that users have now preferred to carry out monetary exchange without visiting brick and mortal banks. Hence, era of cash-based payment system is gradually fading as the need to operate cashless preponderates modern Nigerian economy (Siyanbola, 2012; Omotunde, Tunmi and Dewole, 2012).

In recent time, e-payment system has become a medium through which monetary substance circulates conveniently, especially in developing economy like Nigeria where the carrying cash around is habitual. In Nigeria, e-payment system formed fundamental starting point of her modern market economy; a well-functioning e-payment system has been recognised to have much relevance on financial stability, monetary policy and overall economic activity (CBN, 2011). Historically, Central Bank of Nigeria (CBN) introduced payment system which facilitated e-payment in 2002. During this period, Nigeria Automated Clearing System (NACS) was introduced as a veritable platform for development of electronic payment and to reduce clearing of cheques period. In addition, Automated Teller Machine (ATMs) was introduced by Interswitch in 2003 followed by the implementation of Real Time Gross Settlement in 2006, migration to new uniform accounting system (NUBAN) in 2010. Subsequently, in the early of 2011, Nigerian Inter-bank Settlement System announced instant payment services and the first set of cash deposit ATMs were launched (KPMG, 2012). Consequently, transition to cashless economy was proposed in December, 2011 and first implemented at Lagos in January, 2012. At the end of 2013, cashless policy is envisaged to have been effectively implemented in Abuja, Port-Harcourt, Abia, Kano and Ogun State.

Several studies have been carried out on e-payment system in Nigeria (Asaolu, Ayoola & Akinkoye, 2011, Echekoba & Ezu, 2011; Adeoti & Osotimehin, 2012; Odior & Banuso, 2012; Siyanbola, 2013; Eze, 2013; Nkwanko & Eze, 2013; Odemuru, 2013). Such studies revealed that e-payment system is increasingly gaining users' acceptance and there is gradual increase in the percentage of non-cash transactions in the last few years, despites several challenges identified with e-payment system or non-cash payment system (Nkwanko et al, 2013). Interestingly, approximately N80 billion of electronic transactions are currently being recorded daily

(CBN, July 2013). Hence, present transition to Nigerian cashless economy by CBN has been reinforced by perceived prosperity of electronic payment system - citizenry continuous use of ATMs, POS, ETF, Smart cards, e-cheques, etc. (Echekoba et al, 2011).

Moreover, to complement implementation of electronic payment system, CBN introduced cashless policy into Nigerian financial system with the sole aim of achieving Vision 2020. According to CBN (2011), an effective and modern payment system is positively correlated with economic development and is a key enabler for economic growth, though this has not been supported by empirical evidence in the case of Nigeria. However, for the fact that e-payment system is gaining prominence in Nigeria does not guarantee successful transition to cashless economy nor positive relationship found between e-payment system and economic growth in developed countries and/or other developing countries preconditions its implementation in Nigeria. Meanwhile the drive for a cashless economy as a preference for new generation should be supported with sound education, age advantage, possession of appropriate relevant technological infrastructures, among other factors, rightly put in place by all concerned members of the financial system and efficiently regulated before citizens are forced to comply.

Since the implementation of Cashless Lagos, there have been concerns from many Nigerians about the success of cashless policy in other parts of the country in spite of prosperity it witnessed in Lagos (CBN, 2013). Several questions have been raised: to what extent can electronic payment system influence economic growth in Nigeria? Can a country such as Nigeria where there is prevalence of large number of low income group characterized by low level of literacy and large volume of cash-based transactions, among others, transit to cashless economy? Can punitive measures embedded in current cashless policy warrant its successful implementation in Nigeria? Yet, there is dearth of empirical studies that provide quantitative evidence of the relationship between e-payment system and economic growth in Nigeria and this is the main justification for current transition to cashless economy. Hence, this study sought to provide empirical quantitative evidence of the relationship between e-payment system and economic growth as a means of reviewing transition to cashless economy in Nigeria.

2.0 Literature Review

2.1 Conceptualizing E-payment System

The term electronic payment system is all-inclusive, depicting different dimensions of electronic delivery multichannel. Its usage for different purposes presents increases imprecision of defining e-payment in the literature. E-payment could be viewed from its functions as m-payment, e-banking, e-money, online banking, internet banking, e-finance, e-broking, etc. Nevertheless, researches showed some attempts to define e-payment (Humphrey, Willesson, Bergendahl & Lindblom, 2006; ECB, 2001; Raja, 2008; Oginni, 2013). ECB (2001) viewed e-payment as an electronic preservation of economic substance on an intelligent device generally employed to make payments of undertakings apart from the person who issues it without involving bank accounts in the transaction, though acting as a prepaid bearer instrument, elsewhere e-payment is viewed as the use of credit cards, automated teller machines, debit cards, stored value cards, mobile wallets and others of similar nature to make payments (Oginni, 2013).

Similarly, Snellman, Vesala and Humphrey (2001) defines e-payments as any payment service that makes use of information and communications technologies including Integrated Circuit (IC) cards, cryptography and telecommunications. However, in this study, e-payment refers to delivery multichannel that provides for electronic exchange of monetary substances without physical contact of the transacting parties. It includes all electronic transactions as well as e-cheque payment. E-payment provides means of transacting business and settling financial commitment electronically without necessarily touching cash in a cashless society.

2.2 State of Cashless Economy in Nigeria

Transition to cashless economy in Nigeria, in the recent time, has generated several researches into its implementation, prospects, challenges and policy implications in Nigeria (Asaolu, Ayoola & Akinkoye, 2011, Echekoba & Ezu, 2011; Adeoti & Osotimehin, 2012; Odior & Banuso, 2012; Omotunde et al, 2012; Nweke, 2012; Siyanbola, 2013; Eze, 2013; Nkwanko & Eze, 2013; Odemuru, 2013, Okeye, 2013). Echekoba et al (2011) examined user acceptability and problems of electronic retail payment systems in Nigeria and found that cash usage is still very high in Nigeria despite efforts of CBN towards the adoption of electronic payment system. The study identified challenges such as inadequate power supply, shortage of critical technological infrastructures, lack of socio-cultural support and absence of regulatory framework that are required to operate seamless and effective electronic payment system. In the same way, Odior et al (2012) examine challenges, benefits and policy implications of cashless banking in Nigeria and found that the shift towards a cashless Nigeria seems to be beneficial though it comes with high level of concerns over security and management of cost savings resulting from its implementation.

Similarly, Nwankwo (2013) studied the problems and prospect of electronic payment in cashless economy of Nigeria and found that electronic payment system has great implication on cashless economy of Nigerian but it will lead to significant decrease in deposit mobilization and credit extension by Nigerian deposit money banks. In addition, Adewale (2013) examined the cashless Nigeria project, subsequent back pedalling in the course of implementation and recent updates and opined that there may be no going

forward in success of cashless economy until the enabling infrastructure, power, adequate security, human capital, the minimum technical/equipment infrastructure required and other structural enablement to successfully drive the implementation are sufficiently addressed. Contrarily, Ochei (2013) studied effective strategies for monitoring and controlling overspending in a Cashless Society as lessons for citizenship empowerment. He proposed a set of flexible strategies for monitoring and controlling overspending among citizens in a cashless society anchored on a triple philosophy: Arrange Acquire and Appraisal. So far so good, the current transition to cashless economy in Nigeria raises a lot of concerns and there is yet no substantial evidence to justify its implementation. This study sought to provide such evidence by examining relationship between e-payment system and economic growth in Nigeria.

2.3 Previous Empirical Studies

Few researches were carried out on e-payment system and economic growth in the recent time. Newstead (2012) examined cashless payments and economic growth and found a link between cashless payment and the pace of economic growth. The study revealed that cashless payment volumes are growing twice as fast in developing economies as they are across the world. Similarly, World Payments Reports (2012) explored the state and evolution of global non-cash payments and found that non-cash payments make it easier and quicker for people and businesses to buy goods and services, pumping money into the system faster and contributing to GDP. The result of the study was similar to Hasan, Renzis and Schmiedel (2012) who explored fundamental relationship between electronic retail payment and overall economic growth using data from across 27 European markets over the period 1995-2009 and found that migration to efficient electronic retail payment stimulates overall economic growth, consumption and trade.

Akhalumeh and Ohiokha (2013) examined the imperatives of Nigeria's Cashless Economy and found that majority of Nigerian of Nigerians are already aware of the policy and majority agree that the policy will help fight against corruption/money laundering and reduce the risk of carrying cash but cyber fraud and illiteracy was envisaged to impede the implementation of the policy. Akhaulmueh et al (2013) findings correspond to Okeye (2013) who appraised cashless economy policy in development of Nigerian Economy. Moreover, Omotunde et al (2012) studied impact of Cashless Economy in Nigeria using survey design through administration of questionnaire and found that cashless policy will increase employment, reduce cash related robbery thereby reducing risk of carrying cash; cashless policy will also reduce cash related corruption and attract more foreign investors to the country. Siyanbola (2013) studied the effect of cashless banking on Nigerian economy and found that cashless banking has the best means of usage because a significant positive relationship exists between cashless banking and Nigerian economy, though no direct proxy of economic growth and cashless banking was used.

From the review above, it is crystal clear that there is dearth of empirical evidence on e-payment system and economic growth as a means of reviewing current transition to cashless economy in Nigeria. Hence this study attempted to provide empirical evidence on e-payment system and economic growth using multiple regression analysis during the period 2005-2012.

3.0 Estimation Methods

Following Hasan et al (2012), a multiple regression model was predicted in equation (1) to establish empirical relationship between e-payment system and economic growth in Nigeria. Data employed in this study include macroeconomic variables, cash penetration variables, cheque penetrations, card penetrations, number of POS Terminals, Trade per capital, interest rates as obtained from International Monetary Fund (World Development Indicators), CBN bulletins and statistics, World Bank Data Sheet and National Bureau of Statistics. Data obtained was analysed through Gretl Econometric Software and SPSS Version 20.

3.1 Predicted Model

$$y_t = \propto y_{t-1} + \gamma' X_t + \varepsilon \quad \text{..... (1)}$$

Where y_t is the logarithm of real per capita GDP in Nigeria at time t, X represent the matrix of macroeconomic indicators and payment channels while ε is the error term. Table 1 presents a summary of variable description of the predicted model. In order to ensure robustness and check over-identifying restriction of heteroscedasticity and autocorrelation, Sargan and Hansen statistics tests were carried out.

4.0 Results

Table 2 presents descriptive statistics on value of transactions as share of real GDP per capita for different payment channels. The use of ATMs increased consistently over the periods. ATM was the most commonly employed e-payment channel in per capita terms while mobile payment channel was the least commonly employed e-payment channel. The result presents reality as mobile payment channel was recently introduced as means of economic exchange in Nigeria. Also, the use of POS terminals is more frequent than mobile payment channels from standard deviation result (Table 2 and Figure 1).

In addition, Table 3 presents the results of estimations using Ordinary Least Square (OLS). Though OLS and Two-Stage Least Square (TSLS), only OLS result was presented since both methods produced the same result. Logarithm of real *GDP per capita* and *Trade Per capita*

served as proxy for economic growth while explanatory variables include the value of ATMs and cheque transactions over real GDP as proxy for *cash penetration*, value of POS terminal transactions over real GDP as proxy for *card payments*, mobile and web payment over real GDP as proxy for other e-payment channels and, finally, interest rate as a control variable. It seems that a significant positive relationship was found between e-payment system and economic growth (*real GDP per capita* and *Trade Per capita*) in Nigeria. E-payment system was found to contribute positively to economic growth (92%) in terms of *GDP Per Capita* and (96%) in terms of *Trade per Capita respectively, other factors remain constant*. In the case of real GDP Per capita, a unit change in e-payment system changes real *GDP per capita* as thrice as e-payment system. Similarly, in the case of *Trade per capita*, a unit change in e-payment system would cause 20units change in *Trade Per Capita*, other factors remained constants. The result corresponds to Siyanbola (2012), Newstead (2012) and World Bank (2012) where a link between e-payment system and economic growth was established. Newstead (2012) observed that cashless payment volumes are growing twice as fast in developing economies as they are across the world.

Moreover, among e-payment channels available in Nigeria, only ATMs contribute positively to economic growth while other e-payment channels such as web payment (online payment), POS terminals, mobile payment and cheque payments contribute negatively to *real GDP per capital* and *Trade per capita* (Table 3). Nonetheless, there are other factors that bear much relevance on effectiveness of e-payment system. Level of literacy and technological development in a country, among others, determine effectiveness of e-payment system and hence, successful implementation of cashless economy (Oginni, 2013).

5.0 Conclusion and Recommendations.

Technological advancement has provided efficient and effective payment system devoid of 'cash and carry syndrome'. Specifically, electronic payment system provides a medium through economic exchanges take place without visiting brick and mortal banks or with no physical presence of the transacting parties. Easiness of making economic transactions as well as a safer and quicker access to funds, among other factors, has placed e-payment system on a more glorified pace than cash-based system (Ayo, 2010; Oginni et. al, 2013). While electronic payment system enjoys prominence in Nigeria, evidence of its contribution to economic growth has not been empirically established. Thus, the study explored relationship between e-payment system and economic growth as means of reviewing current transition to cashless economy in Nigeria. Analysis was done using OLS regression over period (2005-2012). The result of the study indicates that e-payment system significantly positively contribute to economic growth in terms of *real GDP per capita* and *Trade per capita*. Only ATMs was found presently to have contributed positively to economic growth while other e-payment channels contributed negatively. In conclusion, a significant positive relationship exists between e-payment system and economic growth in Nigeria. Hence, the current cashless policy should be tailored towards ensuring effective e-payment system and other factors which bear much relevance on successful transition to cashless economy should be prioritized.

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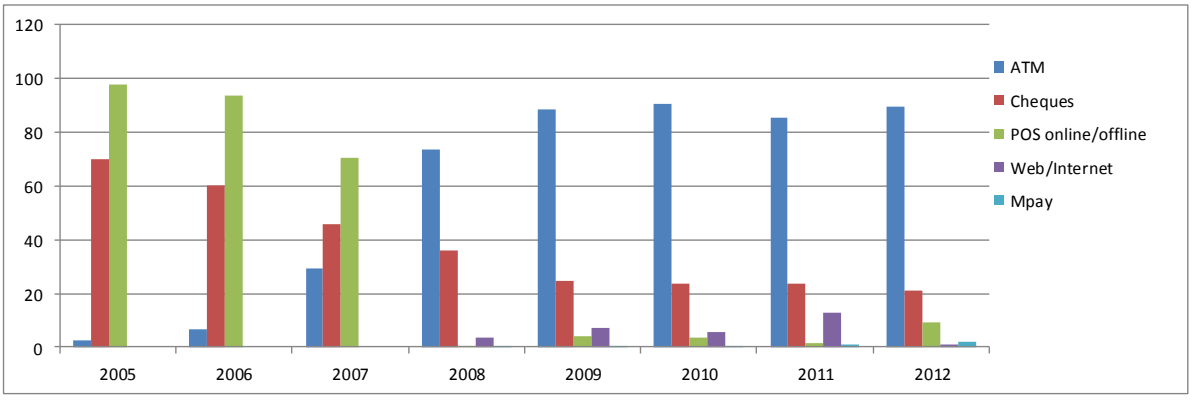
Table 1: Summary of Variables

	Variables	Explanations	Source
ent Variable	LRGDP	Logarithm of Real GDP Per Capital	World Bank (2011)
	Trade per capita	Logarithm of Trade Per Capita	Author's Computation
Independent Variable	POS terminal	Number of POS Terminal in Nigeria	CBN, 2011
	Cash Penetration (ATMs)	Value of cash withdrawals from ATMs over real GDP	World Bank (2011) & CBN (2012).
	Webpay	Value of Online Payment over real GDP	Sotola (2012), CBN (2012) & Author's Computation
	Mpay	Value of mobile payment over real GDP	Sotola (2012), CBN (2012) & Author's Computation
	(Cash Penetration) Cheques	Value of cheque payment over real GDP.	Sotola (2012), CBN (2012) & Author's Computation
	Interest Rate	Demand deposit, time or saving deposits	CBN (2012)

Table 2: Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
LRGDP	2.9	3.2	3.10	0.10
Trade	7.5	12.9	11.23	1.65
POS terminal	0	4	1.98	1.58
ATMs	1.74	90.80	24.51	31.88
Webpay	0	55	17.45	20.84
Mpay	0	2	0.48	0.66
InterestRate	3.5	11.1	7.46	2.51
Cheques	21	70	38.14	18.74

Figure 1: Shares Total Transaction Value (%)



Source: Sotola, 2012 (Modified).

Table 3: Regression results using 48 observations (2005-2012)

	LGDP Per Capita				LTrade Per Capital			
	Coefficient	Std. Error	t-statistic	p-value	Coefficient	Std. Error	t-statistic	p-value
Const	3.24138	0.0395917	81.8703	<0.00001***	20.4992	0.483016	42.4401	<0.00001***
POSterminal	-0.0147626	0.00744256	-1.9835	0.05403*	-0.984222	0.0907987	-10.8396	<0.00001***
ATMs	0.0347431	0.00444282	7.8201	<0.00001***	0.804602	0.0542021	14.8445	<0.00001***
Webpay	-0.0246727	0.00304429	-8.1046	<0.00001***	-0.495065	0.0371401	-13.3297	<0.00001***
Mpay	-1.16775	0.159555	-7.3188	<0.00001***	-30.2743	1.94656	-15.5528	<0.00001***
InterestRate	0.0675966	0.00757782	8.9203	<0.00001***	1.08679	0.0924488	11.7556	<0.00001***
Cheques	-0.0126954	0.00143058	-8.8744	<0.00001***	-0.318263	0.0174529	-18.2355	<0.00001***
Unadjusted R2	0.928323				0.963189			
Adjusted R2	0.917834				0.957802			
F-statistic	88.5022 (p-value < 0.00001)				178.801 (p-value < 0.00001)			
Durbin-Watson statistic	3.43537				3.43537			
Regression Method	OLS /Two-Stage Least Square				OLS /Two-Stage Least Square			