

# AN APPRAISAL OF ELECTRONIC PAYMENT INFRASTRUCTURE TOWARDS AN EFFICIENT CASHLESS POLICY IN NIGERIA

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## Abstract

*The introduction of the Cashless Economy Policy in Nigeria since 2012 aimed at stimulating economic development and modernization of the Nigerian payment system in line with vision 2020. It also aimed at reducing the cost of banking services, drive financial inclusion by providing more efficient transaction options and greater reach of customers, improve the effectiveness of monetary policy in managing inflation as well as curbing negative consequences associated with the high usage of physical cash in the economy; but the question remains: do we have the e-payment infrastructure to guarantee the efficiency of the cashless policy? Thus, the study aimed to appraise e-payment infrastructure towards an efficient cashless policy in Nigeria. Two hundred and fifty copies of questionnaire were distributed to bank customers and two hundred and twenty nine were returned. Tables and percentages were used to make analysis while chi-square statistical method was used to test the hypothesis. The study revealed that bank customers are faced with several challenges such as online frauds, insecurity of personal data. Also operator's network/service fluctuation and poor interconnectivity of banks network servers is still a major challenge impeding the efficient use of mobile banking services. The study affirms that effective e-payment infrastructure is an essential tool to achieving an efficient cashless policy in Nigeria and recommends that more Point of Sale (POS) terminals should be deployed, Automated Teller Machines (ATMs) should properly be managed while all efforts should be geared toward ensuring stable electric power and efficient telecommunication services delivery.*

According to Achor and Anuforo (2013), globally, a shift in policy paradigm is usually necessitated by a need to address certain perceived anomalies in the economic landscape. Policy switch is a function of prevailing circumstance which experts believe must have potential to drive the entire process of economic transformation or change. It must also impact positively on human development indicators. Some economic policies are either completely phased out or modified largely due to inherent problems associated with their modus operandi. In global setting, payment system is one of such policies that have undergone substantial change. Over the course of history, different forms of payment systems have been in existence. Initially, trade by barter was

common. However, the problems of barter such as the double coincidence of wants necessitated the introduction of various forms of money. This era became the cash-based economy, which most countries are gradually phasing out, modifying or integrating into a new cash-less-based system (Daniel, Swartz & Fermar, 2004). Nevertheless, pundits have been predicting the complete demise of study instruments and the emergence of potentially superior substitute for cash or monetary exchanges, that is cashless society (Odior & Banuso, 2012, Nweke 2012). Recent developments in technology for financial transactions has increasingly fuelled the use of electronic-based payment instruments globally.

In recent years, Nigeria has been experiencing a growth turnaround and conditions seem right for launching onto a path of sustained and rapid growth, justifying its ranking amongst the N11 (Next Eleven countries of Bangladesh, Egypt, Indonesia, Iran, South Korea, Mexico, Nigeria, Pakistan, the Philippines, Turkey and Vietnam) countries as identified by Goldman Sachs to have the potential for attaining global competitiveness based on their economic and demographic settings and the foundation for reform's already laid ("Nigeria Vision 2020", n.d.). Constraints to the achievement of Nigeria's ambition to be amongst the top 20 economies of the world by year 2020 is the fact that the Nigerian economy is too heavily cash-oriented in transactions of goods and services which is not in line with global trends

In its efforts to rescue the Nigerian economy from the brinks of total collapse, the CBN in collaboration with the Bankers Committee developed the cashless economy policy designed to provide mobile payment services, breakdown the traditional barriers hindering the financial inclusion of millions of Nigerians and bring low-cost, secure and convenient financial services to urban, semi-urban and rural areas across the country (CBN, 2011).

The cashless economy policy initiated by the CBN was introduced first in Lagos state, the country's economic hub with the aim of achieving an environment where a higher and increasing proportion of transactions are carried out through cheques and electronic payments in line with the global trends. The cashless policy was implemented in Lagos State in 2012 as a pilot scheme and extended to Abia, Anambra, the Federal Capital Territory, Kano, Ogun and Rivers states in 2013. It was later rolled out in the remaining states of the federation in July 2014. An efficient and modern payment system is a key enabler for economic growth, according to the CBN. Stakeholders and operators said the adoption of electronic and mobile payments had grown in the past three years. They however agreed that infrastructure remained the single biggest factor limiting the transition to a cashless society. (Asu, 2014).

This paper undertakes an appraisal of electronic payment infrastructures in order to achieve efficient cashless policy in Nigeria.

### **Brief Review of Literature**

According to Mishkin (2004), payment systems refer to the methods of conducting transactions in the economy. These systems have evolved over centuries alongside the various forms of money. Economists define money as something that serves as a medium of exchange, a unit of accounting, and a store of value (Shmoop Editorial Team, 2008).

Money is a medium of exchange in the sense that we all agree to accept it in making transactions. Merchants agree to accept money in exchange for their goods; employees agree to accept money in exchange for their labour.

As a unit of accounting, money provides a simple device for identifying and communicating value. How much is that bicycle? It's \$200. Without this convenient, readily understood unit of accounting, setting and communicating value would be difficult.

Money serves as a store of value in that it allows us to store the rewards of our labour or business in a convenient tool. In other words, money lets us store the value of a long, hard week of work in a tidy little stack of cash. Without money, how would we set aside the compensation we receive for later use? We could be paid in cows, but that would not be a very convenient way to set aside our unspent compensation. We could be paid in pizzas, but the value of our labour would not be stored in the rotting little pies for very long.

According to Nweke (2012), there are six main forms of money and by extension, six types of payment systems.

- i. **Commodity Money:** Commodity money is money whose value comes from a commodity out of which it is made. Examples of commodities that have been used as mediums of exchange include gold, silver, copper, salt, peppercorns, large stones, decorated belts, shells, alcohol, cigarettes, and candy. This was the prevalent payment system from ancient times until the 19th century. However, the major limitation of this system was the heavy weight of the metals and difficulty in transporting same, in cases of large transactions.
- ii. **Paper Currency:** The limitations of the commodity payment system led to the introduction of paper currencies which had the characteristic of being converted into coins or a definite quantity of precious metals. The paper currency system was prominent in many forms, through the 18th, 19th and 20th centuries. Perhaps, the most prominent form of paper currency and its convertibility was when the US

Dollar could convert to gold at US\$35 to one troy ounce of gold. This obtained between 1944 and 1971, in what is popularly referred to as the Bretton Woods agreement and which gave birth to the establishment of the International Monetary Fund (IMF) in 1944 (Steil, 2013).

However, the paper currency convertibility collapsed in 1971, when the United States government ended the conversion of the dollar to gold under the Nixon Administration (hence this event was tagged the Nixon shock).

- iii. **Fiat Money:** This type of money was introduced in the form of paper currency and decreed by governments to become legal tender. In other words, paper currency without any gold conversion was legal and had to be accepted as a medium of exchange and in payment of debt.

The major drawback of paper currency and fiat money was also the bulkiness of transferring large volumes of its reserves from one location to another.

- iv. **Cheques:** This form of money was introduced to combat the problem of stolen paper monies and bulkiness of transfers. The cheque is essentially an instruction from an individual to the bank to transfer money from his/her account to another, when the cheque is deposited. It therefore allows transactions take place and eliminates the need to carry around large amounts of currency. The introduction of cheques was a major innovation that improved the efficiency of payment systems. However, this system also had its own drawbacks which include the length of time it would take to get the cheque from one location to another, and the period before which the bank would allow an individual utilise funds realised via a deposited cheque. In other words, there was a problem of delays in cheque clearing and settlement as well as the associated costs of producing cheques.
- v. **Electronic Payment:** The advent of inexpensive computers and the Internet revolutionised payment systems by introducing methods by which payments could be transmitted electronically. This helped to solve some of the clearing and settlement problems associated with cheques, as well as the associated costs of producing the cheques.
- vi. **E-Money:** This is an offshoot of electronic payments, whereby e-payments do not only substitute for cheques but also for cash, in the form of electronic money (e-money). The first form of e-money was the debit card which enabled consumers to purchase goods and services by electronically transferring funds directly from their bank accounts to a merchant's account. This was usually accessed through a card reader at the sales point, hence the name point-of-sales (POS) machine. Other forms

of the e-money payment systems were the stored-value card which allow payments for transactions subject to a preset value limit, lodged as cash in the card-linked account. There is also the e-cash which is typically used on the Internet to purchase goods and services online.

The evolution of payment systems into electronic form and the convenience of e-money transactions, have furthered the argument and indeed, the transition of society into a cashless one. As Nakajima (2012) explains, “The evolution of payment systems will never stop. Payment systems are social infrastructures that support all economic activities, and the financial markets will require more sophisticated payment systems with greater safety and efficiency.”

A cashless society is a gradual movement of the payment system of an economy from the use of physical cash to a systemic adoption of other non-physical cash modes of payment in settlements of all types of transaction both in the public and private sectors of an economy. According to the Central Bank of Nigeria (CBN), the cashless society is embarked on to:

- i. drive the development and modernization of the payment system in line with Nigeria’s vision 2020 goal of being amongst the top 20 economies by the year 2020. An efficient and modern payment system is positively correlated with economic development and is a key enabler of economic growth.
- ii. reduce the cost of banking services (including cost of credit) and drive financial inclusion by providing more efficient transaction options and greater reach.
- iii. improve the effectiveness of monetary policy in managing inflation and driving economic growth.
- iv. curb the negative consequences associated with high cash usage, which has resulted to a number of challenges across the system. Example of challenges resulting from high-cash usage includes: corruption, robberies and cash-related crime, high cost of processing borne by every entity across the value chain (i.e. from CBN, to banks, to the operating entities as well (e.g. staff required to process cash transactions, manual operating systems, etc)), revenue leakage arising from significant handling of cash, inefficient treasury management due to nature of cash processing, limitations of monetary policy due to high volumes of cash outside the formal economy and encourages money-laundering, terrorist funding, etc (CBN, 2011).

### **Cashless Banking Channels**

The most outstanding cashless banking channels world over are Mobile banking; internet banking; telephone banking; electronic card; implants; PoS terminals and ATMs. They are all explained below:

### **1. Mobile Banking**

Mobile banking is a system that allows customers of a financial institution to conduct a number of financial transactions through a mobile device such as a mobile phone or tablet. Mobile banking differs from mobile payments, which involve the use of a mobile device to pay for goods or services either at the point of sale or remotely, analogously to the use of a debit or credit card to effect an EFTPOS payment. Mobile payment is also known as mobile money transfer or M-payment. It uses card infrastructure for movement of payment instructions as well as secure SMS messaging for confirmation of receipts to the beneficiary.

### **2. Internet Banking**

This is an electronic payment system that enables customers of a financial institution to conduct financial/ banking transactions on the internet and world wide web (www) using electronic tools such as the computer without visiting the banking hall. Internet banking is also referred as Online banking, e-banking, virtual banking. E-commerce is greatly facilitated by internet banking and is mostly used to effect payments. Internet banking, like mobile banking, also uses the electronic card infrastructure for executing payment instructions and final settlement of goods and services over the internet between the merchants and the customers. Commonly used internet banking transactions in Nigeria are settlement of commercial bills and purchase of air tickets through the websites of the merchants. Level of awareness of the advantages of this product to the saving populace is still very low; hence there is every room for improvement if cashless banking would be effective as expected.

### **3. Telephone Banking**

Here the customers can access their accounts using telephone lines as a link to the financial institution's computer centre. Services rendered here include account balance transfer; change of pin etc. This product has also experienced low patronage due to inadequate awareness and education of the customer on how to maximally use their phone to transact simple banking operations.

### **4. Electronic Cards**

This is a physical plastic card that uniquely identifies the holder used in transacting business on the internet, Automated Teller Machines (ATM) and Point of Sales (PoS) terminals (Carow, & Staten, 2000). This includes debit and credit cards; debit cards are linked to local bank accounts and offer immediate confirmation of payment while credit cards can be used for assessing local and international networks. As credit cards are widely accepted in most countries, the underlying infrastructures and operational rules are often provided by global trust schemes (such as Visa and Master Card) in addition to local lines. Debit cards are the dominant cards in Nigeria, they are also known as ATM

cards and their usage is wider than PoS transactions given the current limited deployment of PoS terminals.

## **5. Implants**

It is a technology that would allow a microchip to be placed in the human hand that would identify every human being on the planet and allow them to buy and sell without coins, paper or card. Already, a number of biochip programs have been instituted on animals. The program is called Infopet in Los Angeles. In the program, an I.D. chip is injected into animals in order to identify them.

## **6. Point of Sale (PoS)/Point of Purchase (PoP) Terminals**

A point of sale terminal (POS terminal) is an electronic device used to process card payments at retail locations. A POS terminal generally does the following:

- i. Reads the information off a customer's credit or debit card
- ii. Checks whether the funds in a customer's bank account are sufficient
- iii. Transfers the funds from the customer's account to the seller's account (or at least, accounts for the transfer with the credit card network).
- iv. Records the transaction and prints a receipt

## **7. Automated Teller Machines**

This is a computerised device that provides the customers of a financial institution with access to financial transactions in a public place without a need for assistance from bank teller or any official. It is the commonest form of electronic banking which has gained popularity among the people including unlettered customers.

## **The Challenges of the Cashless Policy**

Attractive and laudable as the policy is, several challenges in reality affect its effectiveness and are discussed below.

### **i. Infrastructural Deficit**

The gaps in infrastructure pose a huge challenge to the achievement of the policy. The level at which the country's power sector is at right now does not indicate that it can support a cashless system. Nigeria's power system is quite irregular and steady power supply is key in achieving the policy. Thus, power must be improved dramatically to accommodate smooth operations of financial activities. It is worthy to note that the banks are collaborating to participate in the CBN initiative of Shared Services, in order to share and lower infrastructure costs, which will go a long way in enhancing infrastructure.

Zulu (2006) identified the challenges of e-Payment in Africa as inadequate telecommunication infrastructure which include: connectivity failure in telephone lines;

low Internet bandwidth; high Internet cost, unavailability of dedicated data service networks and close financial networks.

Lack of Unique National Identity System which makes it difficult to implement the policy efficiently and effectively. The effect of this is that one can rob Peter to pay Paul. Thus, one can dupe a bank today and reappear in another area under another name.

**ii. Inadequate POS Systems**

The effective operation of the policy is partly hinged on the availability of adequate Point of Sale (POS) machines. The proposed deployment by the CBN of an estimated 40,000 POS terminals expected to complement existing e-payment channels in the country was not achieved before the official launch of the scheme in Lagos due to tariff bottlenecks encountered with the Nigeria Customs Service. Furthermore, POS are occasionally fraught with technical hitches caused by erratic internet connectivity as well as epileptic power supply.

**iii. Awareness Level**

Another challenge to the success of the policy is the current level of awareness. The knowledge base needed for the success of the policy is not yet anything near what should allow for the implementation of the policy. There is a need for increased knowledge, skills and capabilities acquired through education and training of labour force in the financial institutions. The CBN in collaboration with the Banks need to continue to educate and sensitize the masses on the benefits of e-payments as a modern, secure and efficient means of transaction.

**iv. Legal Security**

Anything that's technological comes with a baggage of risks and security threats. A very high and unbreachable degree of security would be needed as a deterrent to hackers and cyber criminals. Security is a key determinant in the success of the policy as it builds the confidence of users. A solid legal framework for the e-payment system is essential for creating a certain and reliable environment for economic agents and ensuring the system functions adequately. The e-payment system involves the use of electronic means whose legal validity and mandatory effects must be clearly defined and consequently requires a sound and efficient legal framework that allows its implementation and use under conditions of legal security. Under the new Evidence Act 2011 (the "Act"), electronic evidences are now acceptable in court. This would address some of the challenges in civil and



criminal cases as they relate to admissibility of electronic evidence which will relate to the Policy but that is not all that is needed. The development of the Policy should be hinged on governing laws and regulations aimed at enhancing and not just regulating the system. Furthermore, the legal framework should take into consideration transaction security in view of the problem of porous web pages, and the vulnerability of confidential information to hackers.

**Methodology**

The descriptive survey was adopted in carrying out this research and its success was based on the administration of questionnaire. The population covered banks in Warri and its environs city numbering 20. A total of two hundred and fifty (250) questionnaires were distributed to the sampled banks’ customers selected at random. Respondents’ responses were analysed using frequency distribution and percentages while chi-square was used to test the hypothesis.

**Data Presentation, Analysis and Hypothesis Testing**

Two sets of questionnaires were administered, one to the marketing/customer care unit staff of the five selected banks and the other one to the customers of the same five selected banks.

**Table 1: Analysis of Questionnaires Administered to Banks’ Customers**

	Q administered	Returned	Not Returned
Banks	250	229(91.6%)	21(8.4%)
Total	250	229	21

**Table 2: Electronic Payment Infrastructures Towards an Efficient Cashless Policy in Nigeria**

Questions	SA	A	U	D	SD	TOTAL
Electricity supply do affect e-payment transactions	162	045	007	011	004	229
PoS terminals are abundantly available	001	001	004	032	191	229
ATM transactions are efficient and reliable	001	003	041	041	143	229
I do have failed transactions on mobile banking	111	069	046	001	002	229
Internet banking is always accessible and reliable	011	008	009	024	177	229
TOTAL	286	126	107	109	517	1145

The above table shows that 162 (70.3%) of the customers strongly agree that electricity supply do affect e-payment transactions, 45(19.65%) agree, 7(3%) are undecided 11(5%) disagree while the remaining 4(2%) respondents strongly disagree, which means electricity supply plays a significant role in delivering e-payment vis-à-vis cashless policy.

1(0.4%) of the customers strongly agree that POS (Point of Sale) terminals are abundantly available in Warri and its environs, 1(0.4%) agree, 4(1.7%) are undecided 32(14%) disagree while the remaining 191(83%) respondents strongly disagree, which means POS terminals are not abundantly available in Warri and its environs which will hinder efficient cashless policy in the state. 1(0.34%) of the customers strongly agree that ATM transactions are efficient and reliable, 3(1.3%) agree, 41(17.9%) are undecided, 41(17.9%) disagree while the remaining 143(62.4%) respondents strongly disagree, which means ATM transactions are not so reliable and efficient.

111(48.5%) of the customers strongly agree that they do have failed transactions on mobile banking transactions, 69(30.1%) agree, 46(20.1%) are undecided, 1(0.4%) disagree while the remaining 2(0.8%) respondents strongly disagree, which means majority do have failed transactions on mobile banking transactions which is as a result of inefficient mobile network service provider.

11(5%) of the customers strongly agree that internet banking is always accessible and reliable, 8(3.5%) agree, 9(3.9%) are undecided 24(10.5%) disagree while the remaining 177(77.3%) respondents strongly disagree, which means internet banking is not always reliable and accessible.

### **Testing of Hypothesis**

Hypothesis I Ho: Effective e-payment infrastructure is an essential tool for an efficient cashless policy

**Table 3: Calculation of Chi-Square for Hypothesis I**

o	e	o-e	(o-e) <sup>2</sup>	(o-e) <sup>2</sup> /e
162	57.2	104.8	10983.04	192.0
045	25.2	19.8	392.04	15.56
007	21.4	-14.4	207.36	9.69
011	21.8	-10.8	116.64	5.35
004	103.4	-99.4	9880.36	95.55
001	57.2	-56.2	3158.44	55.22
001	25.2	-24.2	585.64	23.24
004	21.4	-17.4	302.76	14.15
032	21.8	10.2	104.04	4.77
191	103.4	87.6	7673.76	74.21
001	57.2	-56.2	3158.44	55.22
003	25.2	-22.2	492.84	19.56
041	21.4	19.6	384.16	17.95
041	21.8	19.2	368.64	16.91
143	103.4	39.6	1568.64	15.17
111	57.2	53.8	2894.44	50.6
069	25.2	43.8	1918.44	76.13
046	21.4	24.6	605.16	28.28
001	21.8	-20.8	432.64	19.85
002	103.4	-101.4	10281.96	99.44
011	57.2	-46.2	2134.44	37.32
008	25.2	-17.2	295.84	11.74
009	21.4	-12.4	153.76	7.19
024	21.8	2.2	4.84	0.22
177	103.4	73.6	5416.96	52.39
Total				997.72

dof = 16

Using the chi-square distribution table by checking the level of significance of 5% (0.05) against the degree of freedom (16).

$$X_t^2 = 26.27 ; X_c^2 = 997.72$$

**Decision Rule**

Reject H<sub>0</sub>: if  $X_c^2 > X_t^2$ ; Accept H<sub>1</sub>:  $X_c^2 > X_t^2$

Therefore accept  $H_1$ , that is, effective e-payment infrastructure is an essential tool for an efficient cashless policy.

### **Summary of Findings**

Based on the data analysis, hypothesis testing and interpretation of result, it was observed that effective e-payment infrastructure is an essential tool to achieve an efficient cashless policy in Nigeria. Effective and efficient e-payment infrastructures which includes ATM, PoS terminals, Mobile banking/phone connectivity and internet banking connectivity are very essential to achieve a cashless society but, it was noted that these infrastructures are either not abundantly available or not efficient. This study shows that these needed infrastructures are not reliable as it do fail customers even when they are needed most. Mobile banking that is aimed at covering the unbanked population too usually face network problem as a result of the inefficiency of the mobile network service providers. The same thing goes to the internet service providers; most customers have almost four networks' modems if not universal with several network sims, but yet the story of network problem is the same. In summary, the e-payment infrastructure is so essential for an efficient cashless policy but they are neither sufficient nor efficient.

### **Conclusion**

The success of the cashless policy across Nigeria is key to the country's economic progress and furtherance of its recently crowned status as Africa's largest economy. The CBN does posit that "an efficient and modern payment system is positively correlated with economic development, and is a key enabler for economic growth." The onus therefore lies on the CBN to ensure a seamless transition from the traditional cash-driven economy to a more secure, electronic system of financial services delivery.

While some economies are much further along in the establishment of cashless alternatives, potential challenges still exist for the Nigerian banks and polity in this regard. The fragmented nature of the Nigerian industry could limit the speedy adoption of cashless alternatives in Nigeria. However, overall success in the long run will be hinged on timely execution of key imperatives.

### **Recommendations**

One of the greatest challenges facing the Nigerian economy is the need to provide basic infrastructure that can stimulate and accommodate economic growth as well as uplift the average citizen from poverty. Internet broadband, mobile phones, and main telephone lines are among the primary telecommunication technologies identified as drivers of economic growth. Nigeria is faced with increased pressure from the United Nations as well as the World Bank to improve access and use of telecommunications

infrastructure because the flow of information between rural and urban areas is crucial in the fight against poverty and achievement of the Millennium Development Goals. Technology infrastructure continues to be a major impediment to the widespread adoption and acceptability of the cashless policy. While Nigeria has recorded commendable growth in IT adoption and mobile penetration, internet or broadband penetration remains low. To harness greater output from the telecommunication industry, policies to support consumer's protection may be necessary, in addition to improved security and an enabling environment to encourage as well as enhance the telecoms operators in the country.

In addition to ensuring that appropriate technology such as the chip+PIN for card transactions are deployed, the apex bank should mandate all banks to comply with requirements for highly secured online payments platform by implementing cutting edge electronic banking security solutions including but not limited to the implementation of hardware tokens, behavioural monitoring, SMS/Email transaction alert, and anti-phishing solutions.

Furthermore, the CBN in collaboration with the Bankers Committee should implement an industry-wide anti-fraud system to manage risks, minimize fraud and respond promptly and adequately to emerging fraud trends even as other statutory bodies like the Nigeria Electronic Fraud Forum are engaged in a continued effort to explore options at improving strategies for tackling fraud in the Nigerian electronic payments landscape.

With the determination of the Nigerian government to improve on electric power infrastructure as is evident with the power sector reform which has led to the privatization of the electricity distribution and generation companies, it is hoped that as electricity improves, the drive for electronic payments will benefit especially as telecom infrastructure will be positively impacted thereby resolving connectivity issues. Other options should be explored such as the apex bank's project with Nigerian Communication Satellite (NIGCOMSAT) Limited to leverage satellite technology for improvement of connectivity for the various payment channels.

The CBN must provide the enabling environment that will encourage private investors to plough their funds into building an elaborate, stable, reliable and efficient electronic payment backbone infrastructure to support the nationwide use of electronic channels for cash transactions.

As a way of negating the poor public infrastructure maintenance culture in this country so that the apparent gains being made in the gradual acceptance of the cashless policy by the citizens of this country are not lost quickly, the CBN should have in place

appropriate regulatory framework for collaboration amongst relevant stakeholders including Nigerian Inter-bank Settlements System (NIBSS), commercial banks, private investors, etc to provide timely and dependable support and maintenance services to merchants using POS terminals and devices.

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