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CASHLESS POLICY IN NIGERIA: DETERMINANTS, SUCCESS AND SUSTAINABILITY

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Abstract: *The CBN introduced the cashless policy in April 2011 with the objective of promoting the use of electronic payment channels instead of cash. This study examines the cashless policy and the factors that could influence its sustainability in Nigerian economy. Specifically, it examines factors such as ATM transaction, Web transaction, POS transaction, Mobile payment transactions, broad money supply, fiscal policy, exchange rate, credit to the private sector and their implications on cashless policy proxy by currency in circulation. Ex-post facto design was adopted. Data were collected through CBN statistical bulletin covering the period 2009 to 2021. Analyses were carried out using descriptive statistics, multiple regression and granger causality. Findings revealed that ATM transactions, mobile payment, web payment, money supply, fiscal policy had reducing effect on currency in circulation. On the other hand, POS transactions, credit to the private sector and exchange rate increased the amount of currency in circulation. It concluded that the cashless policy of the CBN can only be successful when some of the selected studied factors are put into consideration. The study recommends urgent need to address the problem of exchange rate instability, growing concern with the cash available with POS operators who now charge exorbitant fees for cash withdrawal and credit to the private sector.*

Keywords: Cashless Policy, Electronic Payment Channels, Sustainability of Cashless Policy, Factors Influencing Cashless Transactions, Central Bank of Nigeria (CBN) Initiatives

1.0 Introduction

In April 2011, CBN introduced cashless policy in Nigeria with a view to addressing some of the attendant ills of cash based economies. According to Ajayi and Ojo (2006), the prerequisite for the development of national economy is to encourage a payment system that is secure, convenient, and affordable. The existence of the cashless economy is evidenced by: e-finance, e-banking, e-money, e-brokering, e-exchanges, etc (Gbanador, 2023). In the contemporary economy, noncash payment mechanisms like credit and debit cards predominate over the use of cash in payments (Nwekpa, Djobissie, Chukwuma, & Ezezue, 2020). According to Osazevbaru and Yomere (2015), a cash-based economy is one in which most retail and business payments are made in cash. By taking into account the volume of retail and commercial operations conducted in cash as well as the value of these transactions as a percentage of income per capita, Achor and Anuforo (2013) characterized Nigeria as a cash-based economy. Over N2.1 trillion, or 5% of GDP, or over 215 million client transactions in Nigerian banks in 2023 were expected to be less cash-related (i.e., done over digital or electronic channels) (CBN, 2022). It estimated the total cash transaction volume through the conventional five payment channels (POS, Web, mobile, ATM, over-the-counter) to be 215,015,005 (two hundred and fifteen million, and fifteen thousand and five naira). Of this figure, ATM withdrawal accounted for 50.9%, over-the-counter

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(OTC) withdrawal, 33.72% and cheques 13.56%. Point of sales (POS) and web channels accounted respectively for 0.49% and 1.26%. Obviously, the combination of ATM and OTC withdrawals amounting to 84.96% justifies the claim of the CBN that the Nigerian economy is heavily cash-based and the imperative for cash-less economy.

Furthermore, a cash based economy also imposes some costs on the banking system, individuals, and the government (Adegbie, Kehinde & Owolabi, 2020). The higher the velocity of cash usage, the higher the processing cost borne by those in the value chain. There is, for instance, the cost of printing new notes to replace the ones that are torn or worn out due to frequent handling. Central Bank of Nigeria (2022) states that this cost is high and also on the increase hence the attempted redesign of the currency. It puts the direct cost of cash to the Nigerian financial system as at 2009 at a colossal amount of N114.5 billion. The figure is based on actual data from the CBN and 17 banks in the FSI. It excludes bank cash infrastructure cost and employee costs attributable to cash logistics. This amount is broken down into: cash in transit cost N27.3 billion (24%), cash processing cost N89.1 billion (67%), and vault management cost N18.1 billion (9%). The estimated cost of cash by the end of 2012 was put at N192billion (Osazevbaru & Yomere, 2015). To Osazevbaru and Yomere, this evidence provides a platform for migration to cash-less economy.

In 2022, the CBN further laid emphasis on its cashless policy which took a new dimension in January 2023 with new currency redesign of 200, 500, 1,000. It also stipulates that banking customers cannot access more than ₦10,000 over the counter and N20,000 daily cash withdrawal from the ATM machines. The CBN further expected more transactions over the various digital channels such as USSD, Mobile banking, online banking, web banking, ATM. In addition, the cashless policy aims to curb some of the negative consequences associated with the high usage of physical cash in the economy, including: high cost of cash: high risk of using cash, high subsidy, informal economy and inefficiency and corruption (CBN, 2022).

Success and sustenance of cashless policy is dependent on variegated factors. Literature have identified some of these factors to include money supply decision, exchange rate stability, fiscal policy of the government, credit to the economy, development and effectiveness of the various e-payment channels etc. Other factors difficult to measure, yet can present insidious cog to the policy include the general acceptability of the society, political will and stability of the economy. Studies have shown that cashless policy in Nigeria have faced and will continue to face numerous challenges for it to be successful (Ejiobih, Oni, Ayo, Bishung, Ajibade, Koyejo & Olushola, 2019; Nwani, Nwaimo, Kanu & Chinonso, 2020). This present study therefore looks at selected factors and how they tend to impact on currency in circulation as cashless policy will actually reduce cash in circulation and make transactions more of digital.

This paper seeks to:

i. Determine if there is any significant relationship between Automated Teller Machines (ATM) Transactions and Currency in circulation.
ii. Find out the relationship between POS transactions and currency in circulation;
iii. Identify the relationship between mobile banking transactions and currency in circulation in Nigeria.
iv. Identify the relationship between Web transactions and currency in circulation in Nigeria.
v. Highlight the relationship between money supply and currency in circulation in Nigeria.
vi. Investigate the relationship between foreign exchange rate and currency in circulation.
vii. Find out if there is any significant relationship between fiscal policy and currency in circulation.
Viii Determine if there is any significant relationship between credit to the private sector and currency in circulation.

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This research hypothesizes as follows:

1. H_o: There is no significant relationship between Automated Teller Machine (ATM transactions and currency in circulation in Nigeria
2. H_o: There is no significant relationship between Point of Sales (POS) transactions and currency in circulation in Nigeria
3. H_o: There is no significant relationship between mobile transactions and currency in circulation in Nigeria
4. H_o: There is no significant relationship between web transactions and currency in circulation in Nigeria
5. H_o: There is no significant relationship between money supply and currency in circulation in Nigeria
6. H_o: There is no significant relationship between foreign exchange rate and currency in circulation in Nigeria
7. H_o: There is no significant relationship between fiscal policy and currency in circulation in Nigeria
8. H_o: There is no significant relationship between credit to the private sector and currency in circulation in Nigeria

2. Review of Related Literature

2.1 Cashless Policy

Odior and Banuso (2012) see cashless policy as a combination of e-banking and cash-based system. It is essentially a mobile payment system which allows users to make payment through GSM phones with or without internet facilities. The recent evolution of technology for financial transactions poses interesting questions for policy makers and financial institutions regarding the suitability of current institutional arrangements and availability of instruments to guarantee financial stability, efficiency and effectiveness of monetary policy. 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. 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". Analogous to this definition is that of cashless economy wherein there exist no notes and coins issued by central banks but by private financial institutions (De Grauwe, Buyst & Rinaldi, 2001). Omotunde, Sunday and John-Dewole (2013) defined cashless economy as an economy where transaction can be done without necessarily carrying physical cash as a means of exchange of transaction but rather with the use of credit or debit card payment for goods and services. Osazevbaru and Yomere (2015) defined cash-less policy as that financial system which aims at reducing, but not eliminating, the volume of physical cash circulating in the economy whilst encouraging more electronic based transactions.

The cashless effort involves leveraging information and communications technologies to conduct cash transactions electronically (ICT). It has continued to change the way banks and their corporate relationship are organized world-wide and variety of innovation devices available to enhance the speed and quality of service delivery (Fadaka & Azeez, 2020). It was described by academics as the upcoming business trend, particularly for companies in the industrial sector. This technology is not limited to computers; it also applies to other activities. They can be used in a variety of ways, such as the following but are not limited to:

- Digitalization of shareholder account services, such as storage and withdrawal;
- ATM use for cash withdrawal and deposit.
- Interbank transactions and online banking.

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Additionally, it encompasses the usage of credit cards, debit cards, mobile pay, and numerous other payment methods, all of which are digital just because paper money is not involved. According to published research, there are six different ways to make electronic payments in Nigeria, including automated teller machines (ATMs), interbank branches, kiosks, point-of-sale terminals, mobile phone, and the web (Bingilar & Bariweni, 2019; Amaduche, Adesanya & Adediji, 2020; Mohammed, Ibrahim & Muritala, 2022). Customers can access their accounts using any ATM locally, nationally, or even internationally. Thanks to the platform that ATM creates. Payment for transactions in this economy can be made by any of the cashless electronic payment methods, such as bank transfers or credit cards. Point of sale (POS) was introduced by the CBN and became the mode of operation in 2011, but only authorized Payment Terminal Service Providers were allowed to connect and maintain POS devices (PTSPs). These POS terminals are used in the same way as ATMs at various commercial locations across the nation. The POS immediately transfers the financial value of the completed transaction to the seller. Private businesses, religious organizations, educational institutions, and other service providers in Nigeria today have embraced the POS option in their transactions (Andrea, Udeh & Allison, 2020). Customers are given cards from the banks that are linked to their accounts. These cards can be used to initiate and complete transactions at POS and ATM terminals. It offers the tools for authentication and verification required to take money out of a customer's account. It can be applied to a variety of payment processes. The component of cashless policy that streamlines the authorized limits of cash transactions for people and institutions beyond which fees apply covers all types of account, especially savings and current, but does not apply to accounts associated with microfinance banks and the government. (Muotolu & Nwadialor, 2019; Nedozi & Omoregie, 2019).

2.2 Components of Cashless Policy

Cashless economy encompasses the following:

Automated Teller Machine: Automated Teller Machine (ATM) is computerized machine which issue receipt or cash to customers when their ATM card is slotted into it. It provides a 24 hour service in Nigeria and it is limited to the amount credited on the ATM card.

Electronic Fund Transfer: This is an electronic oriented payment mechanism which allows customers' accounts to be credited electronically within 24 hours (Ugwu, 1999). It is also designed to ease international transfer of money.

Electronic Data Interchange: This is an electronic oriented program which allows data to be shared and transferred from one branch to another about certain information required on a customer or company such information include customer's account balance, past records and transfer schedule.

MICR Cheques: Magnetic Ink Character Reader (MICR) in Nigeria is used in automated clearing services.

Local Area Network: The linking of all local branches within the state or district through a central computer system at the state or district is known as Local Area Network. This simplifies the problem of waiting for regional or National headquarters to get certain information or response that needs urgent attention especially in transactions.

Wide Area Network: This is a further expansion in the connectivity of the bank branches for easy reach and to serve customers through immediate and timely response to their need.

Point of Sales System: The second-generation remote service unit that is capable of electronically placing a third party into the customer financial institution communication link. POS handles cheques verifications, credit authorization, cash deposit and withdrawal and cash payment. This enhances electronic fund transfer at the point of sales which enables customer's account to be

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debited immediately the cost of purchase in an outlet such as a supermarket or petrol station is removed.

Internet Banking: Internet offers an excellent environment for banks to experiment with the delivery of home banking. It allows customers to check account balances, transfer funds and apply for loans. It uses three-dimensional graphics to enable customers to move into different rooms and communicate with virtual bank tellers, loan arrangers and financial advisers.

Telephone Banking: This is the most familiar tele-banking devices which allows customers to transact business over the phone. These are but few available products in Nigerian commercial banks enhanced by computer in product and service delivery to customers. Over the years computer application in banking operations have changed so much in the financial system and has brought about convenient banking transactions building up bank/bank relationship as well as bank/customer relationship. It is hoped and believed that in the next few years more innovative products will be provided by commercial banks in Nigeria to meet with customer and international demand even with the rapid advanced development in technology (Solomon, 2015).

Mobile Commerce/Mobile Banking: Information resources are accessed using devices that have wireless connections. Telephone banking is a process whereby one branch of a bank calls another where the customer's account is domiciled, to confirm if the account is valid before any transaction of either a deposit or withdrawal. With the advent of global system for mobile communication (G.S.M), we now have some banks using it as a medium of conducting some of their services. Again, with this, the owner can access other transactions like, buying any of the bank e-product/services.

Bankers Automated Clearing Services: The automation focus of the instrument is to reduce the number of clearing days and improve on security arrangement in the course of settlement and collection of cheques (Olanipekun, Brimah, & Ajagbe, 2013). It involves the use of magnetic ink character reader (MICR) for cheque processing which makes it capable to encode, read and sort out changes even as request for cheque books can be made via electronic devices.

Card System: It is a unique electronic payment type which involves the use of smart cards. Smart cards are devices with embedded integrated circuit being used for settlement of financial obligations (Olanipekun, Brimah, & Ajagbe, 2013). It can be used as credit card, debit card and even ATM cards. The power of these cards lie in their sophistication and acceptability to store and manipulate data as well as handling of multiple applications on one card securely. These are:

i. ***Credit cards:*** These are plastic cards encoded with electromagnetic identification. The card is incorporated with circuit on which value is loaded. Customers can use the card to carry out transactions on the ATMs deployed by the issuing banks at strategic locations as well as point of sale terminals with designated signs of the producer of such card. Among the companies that are offering this service to banks are Visa International, which is the leading payment solution system with presence in about 120 countries globally, the Master Card Inc. which is also the second largest credit card brand.

ii. ***Debit card:*** This is an electronic card with very advanced features including the use of microchip, whereby transaction is validated against the chip rather than a magnetic stripe. Among the companies that are offering this service to banks are Visa international, Master card incorporated and an indigenous company called smart switch Nigeria Ltd.

Image Machine/Structured Query Language: The primary objective of Pinnacle Commercial Bank is to introduce this product to facilitate cheque encashment. The

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machine is a photographic and signatures verification system that permits the bank to automatically store signatures and photographs of account holders. With the introduction of the machine, bank is able to conclude withdrawal transactions in a jiffy. (Abdul et al., 2020).

2.3 Factors Influencing the Success and sustainability of Cashless Policy

Notwithstanding the fact that the cash-less policy comes with enormous benefits, there are also some envisaged challenges that could confront the policy. The success and sustainability of cashless policy will face the following challenges:

Financial infrastructure deficit. The cashless payment channels that are currently available are not adequate to cope with the demand of the policy if it is to be implemented religiously. This means that the policy will require further investment of funds by operators and regulators.

Fraud: Given that the system is driven largely by ICT, the policy is exposed to dangers of fraudulent practices as any security lapses can be exploited by the astute fraudster to perpetuate fraud. Internet related crimes like hacking is likely to threaten the cash-less policy in Nigeria.

Power: Electricity is a critical infrastructure for an efficient e-payment system. Sadly, Nigeria cannot boast of steady power supply across its urban and rural areas. This will without doubt affect the success of cash-less policy if not addressed.

High charges: The high charges and fees on some of the electronic channels are capable of generating resistance by the banking public. For example, the recent re-introduction of charges for ATM withdrawals didn't go down well with the users.

Literacy level: To operate successfully in cash-less economy, some level of literacy is required in view of the technology involved. Therefore, Nigeria with high rate of illiteracy will certainly have some challenges. Illiterate population would prefer to keep their money in cash.

Fiscal policy: Obayori (2016) opined that fiscal policy involves the use of government collected taxes and expenditure to influence the level of economic activities in an economy. This policy is used to reduce variations in aggregate spending which are important causes of fluctuations in economic activity in the midst of intricate economic development. Fiscal policy is also the use of government revenue collection (taxation) and expenditure (spending) to influence the economy (Arthur & Sheffrin, 2003). Fiscal policy plays a key role in the sustenance of economic growth and macroeconomic stability. The magnitude of government fiscal surplus or deficit is probably one of the most important statistics used to measure the economic stability (Ezeabasili, Tsegba & Ezi-Herbert, 2012). High deficit may cause higher level of inflation and economic instability especially when government spending far overweighs its revenue which can pose significant problem for monetary policy.

Exchange rate: Exchange rate refers to the price of one currency (the domestic currency) in terms of another (the foreign currency) (Oladipupo & Onotaniyohuwo, 2011). The importance of foreign exchange rate has been traced by Obadan (1994) who noted that its importance as the center piece of the investment environment derives from the argument that a sustained exchange rate misalignment in terms of over-valuation or under-valuation is a major source of macroeconomic disequilibrium which spells danger for investment. The price of foreign currencies in terms of a local currency (i.e. foreign exchange) is therefore important to the understanding of the growth trajectory of all countries of the world. The consequences of substantial misalignments of exchange rates can lead to output contraction and extensive economic hardship. The adverse effect of exchange rate on various economies and investment flows has ensured it continues to receive attention from scholars and governments (Akinboyo, Omotosho, Oladunni & Owolabi, 2020). Moreover,

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there is reasonably strong evidence that the alignment of exchange rates has a critical influence on the rate of growth of per capita output in low income countries. A stable exchange rate encourages, local and foreign investor into such as economy. This is because, an over-valued exchange rate discourage export and negatively affect the foreign private investment (Salako & Adebusuyi, 2002). A high foreign exchange rate increase the prices of goods and services and discourage exportation while at the same time encourages importation of goods which are cheaper. This has negative effect on the investment and can impact on cashless policy of the CBN.

Money supply: Money supply is typically thought of as the total amount of liquid assets that are present in an economy at any given time. There are, however, a number of monetary aggregates that measure the money supply. These aggregates are numerous, and their definitions frequently change throughout time and space. In the context of Nigeria, the sum of currency in circulation includes the demand deposits with the holdings of the public and private sectors with the banking system. These measures of money are typically referred to as M1 and the broad measure of money known as M2. The total amount of savings and time deposits made by the public and private sectors with the banking system are included in the broad measure of money supply, which includes M1 plus quasi money (Nnanna, 2003). According to this school of thought, strong monetary growth is predicted to encourage overall spending and, as a result, production increase, assuming there are available resources. Everything else being equal, monetary stimulation would tend to create inflationary pressures if output is relatively inelastic due to technological constraints, foreign exchange constants, or poor productivity (which is the rule rather than the exception in the Nigerian case). The public, policymakers, and monetary authorities are all quite concerned about the large money supply, and discussions of monetary policy frequently center on how to regulate it. Greater money supply can result in increased spending and higher pricing for goods and services.

2.4 Empirical Literature

Siyanbola (2013) evaluated the impact of cashless banking on Nigeria's economy. The descriptive research design was used for the study, and chi-square was used to evaluate the data. Based on the results, the study recommended that improved government backing, a consistent supply of power, and a communication nexus be taken into account to help Nigeria's cashless banking industry flourish. The adoption of the cashless policy in the Nigerian financial system from 2012 to 2016 was evaluated by Taiwo, Ayo, Afieroho, and Agwu (2016). The study used a survey research approach, and the one-sample t-test and descriptive statistics were used to analyze the data. The study came to the conclusion that the cashless policy would only produce the desired outcome if much effort was put into its efficient implementation. Osazevbaru and Yomere (2015) focused on benefits and challenges of Nigeria's cash-less policy. Using secondary data and content analysis technique, the study found banks' income higher in cash-less setting than in cash based arrangement after factoring POS stakeholders' share of income,. The study concluded that cash-less policy offers immense benefits to the banking sector while recommending that appropriate infrastructures and legal support be provided to facilitate the religious implementation of the policy. A study by Ewa and Inah (2016) looked at the implementation of the Nigeria Cashless Policy. The study used a survey research design, and the collected data was analyzed using simple percentages and the Relative Important Index. The study's conclusions showed that social infrastructures in the areas of power and telecommunications need to be improved, which calls for more awareness to entice those without bank accounts to use banking services. Ejiobih et al., (2019) using questionnaire to find out the challenges of cashless policy implementation in Nigeria found that

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facilitating conditions has no direct effect on actual system use and trust has no positive effect on behavioural intention to adopt the system. The study further showed that despite the implementation of this policy, a lot of users are still being faced with various challenges and more efforts are still being required to achieve an effective cashless society. A cashless economy's operations were evaluated by Nwani, Nwaimo, Kanu, and Chinonso (2020) based on the utilization of checks, funds transfer methods, and automated teller machines (ATMs). Data analysis revealed that the volume and use of checks as a method of financial settlement had failed and that electronic payment systems had partially taken their place. Instead of settling transactions in cash, banks are increasingly using interbank fund transfers. Again, it was determined that there is an increase in the usage of ATMs for financial intermediation. In the near future, it is projected that ATM usage in Nigeria would increase even further. The study's findings have somewhat supported the adoption of the cashless policy idea in Nigeria. The policy's originality and implementation, meanwhile, are not without their own setbacks. Its use is fraught with difficulties, including inadequate infrastructure and difficulty adopting the culture of e-payments due to illiteracy. Celebrations like weddings, birthdays, and festivals are among the other sociocultural elements that pose a barrier.

2.5 Gap in Literature

Large bodies of studies have focused on the link between cashless policy and economic growth; yet very few have empirically looked into aspects of factors that may guarantee the success and long run sustainability of cashless policy, in Nigeria. This paper thus fills the gap.

3. Methodology

Design: The research design adopted in this study is exposit facto. This was used as the study involves use of time series data or data of events that have already taken place which the researcher has no influence or interference on.

Sources of Data: The annual series data are sourced from the Central Bank of Nigeria from 2009-2021. The independent variables data under consideration are ATM transactions (ATM), Point of Sales transactions (POS), Mobile Payment transaction (MOBPAY), Web payment (WEBPAY), Broad Money Supply (M2), Foreign Exchange Rate (FXR), Fiscal policy (FSD), Credit to the Private Sector (CPS). The dependent variable is measured by currency in circulation (CIC). Currency in circulation measures the cash in circulation which is one of the major target of the cashless policy since its aim is to reduce cash spending

Model Specification: That is CIC= f (ATM, POS, MOBPAY, WEBPAY, M2, FXR, FDS, CPS)……..... (i)

The model can therefore be restated mathematically as

$CIC=\beta_0+\beta_1 ATM+ \beta_2 POS + \beta_3 MOPAY+ \beta_4 WEBPAY + \beta_5 M2+ \beta_6 FXR + \beta_7 FDS + \beta_8 CPS + \mu_t$

Where:

μ_t =Error term or unexplained variable

β_0=Parameter of constant CIC

β_1, ….. β_B =Regression intercept or parameters of the independent variables

Method of Analysis: Tests were carried out by the researcher, including limits tests for cointegration and tests of stationarity using the Phillips-Peron method. The purpose of these tests was to evaluate the suitability of the data used for the investigation. The stationarity tests were run to ensure that the chosen cointegration test would be effective. Remember that the cointegration tests are used to determine whether there is a long-term link between the study's time series variables.

4.0 Analysis

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The data for this study were collected from CBN Statistical bulletin from 2009 to 2021.

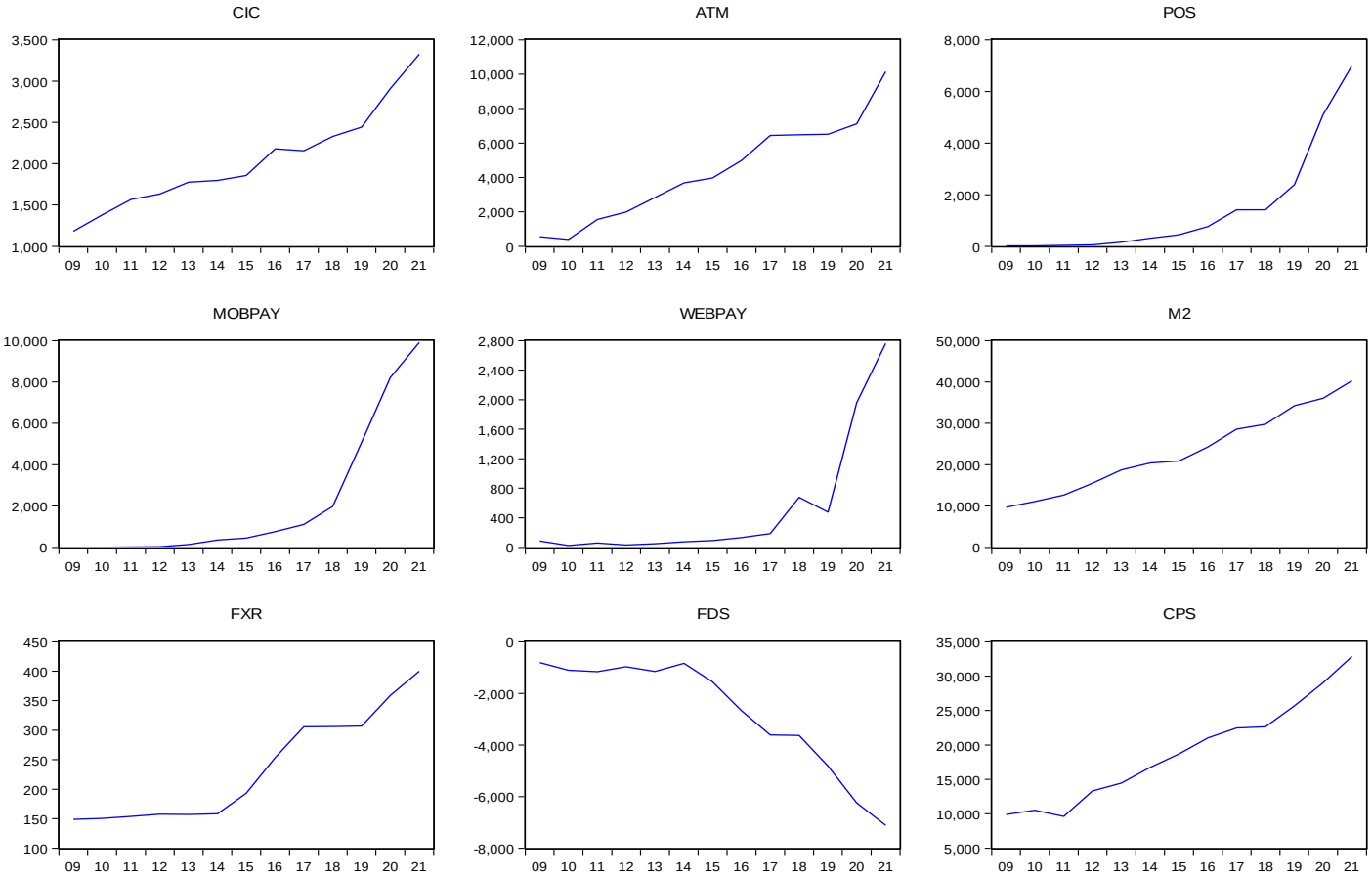

Fig 1: Graphical representation of the series

The graph shows that only FDS (Fiscal deficit and surplus) showing inconsistency while the remaining variables showed an upward trend for the period under review. In other words, transactions through electronic banking platform which is the bone behind cashless policy has gone upward since its inception.

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Table 1: Descriptive Statistics

Date: 04/04/23
Time: 12:02
Sample: 2009 2021

	CIC	ATM	POS	MOBPAY	WEBPAY	M2	FXR	FDS	CPS
Mean	2040.968	4357.554	1467.695	2155.560	508.1664	23247.46	234.6715	-2745.843	18993.11
Median	1857.942	3970.252	448.5125	442.3538	91.58129	20885.52	193.2800	-1557.834	18688.42
Maximum	3325.158	10143.00	7001.090	9904.610	2761.630	40318.29	399.9600	-810.0085	32868.49
Minimum	1181.542	399.7100	11.03000	1.270000	25.05000	9687.507	148.8800	-7118.708	9600.024
Std. Dev.	606.4040	2908.369	2189.120	3378.835	860.1064	9943.946	90.79228	2177.764	7463.732
Skewness	0.670334	0.306650	1.658890	1.462439	1.878832	0.243505	0.503202	-0.864618	0.333456
Kurtosis	2.768327	2.262473	4.458653	3.567586	5.040072	1.859673	1.751220	2.388346	2.061482
Jarque-Bera	1.002660	0.498379	7.114973	4.808411	9.902715	0.832825	1.393328	1.822373	0.718027
Probability	0.605724	0.779432	0.028510	0.090337	0.007074	0.659408	0.498245	0.402047	0.698365
Sum	26532.58	56648.20	19080.03	28022.28	6606.163	302217.0	3050.730	-35695.96	246910.4
Sum Sq. Dev.	4412710.	1.02E+08	57506974	1.37E+08	8877397.	1.19E+09	98918.86	56911848	6.68E+08
Observations	13	13	13	13	13	13	13	13	13

Table 1 shows the descriptive statistics with the mean value for the various variables showing that an average of ₦ 2040.968 billion was for currency in circulation, an average of ₦4,357 billion transactions was made through the ATM annually, an average of ₦1467.695b was transacted through the POS annually, ₦2155.5b was transacted through mobile applications annually, an average of ₦508.16b was transacted through the web payment platform annually which shows most Nigerian banking customers are yet to take to web payments. M2 had an average ₦23247b, CPS had an average of an average of ₦18993.11b, government fiscal deficit/surplus averaged -₦ 2745b annually which implies excess borrowing and spending. Exchange rate rose from minimum of ₦148/$1 to 399.96/$1 within the period under review which is likely to cause increment in cost of goods and services and increment money in circulation vis a vis cash. The Jacque Bera shows that POS and WEBPAY are statistically significant with a prob value of 0.0285 and 0.0078 respectively which implies that they are not normally distributed while the CIC, ATM, MOPAY, M2, FXR, FDS and CPS are insignificant but normally distributed.

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Table 2: Correlation Matrix

	CIC	ATM	POS	MOBPAY	WEBPAY	M2	FXR	FDS	CPS
CIC	1.000000	0.966916	0.928434	0.913468	0.878217	0.971794	0.948464	-0.956978	0.975545
ATM	0.966916	1.000000	0.852766	0.823088	0.782589	0.982210	0.953397	-0.917547	0.979497
POS	0.928434	0.852766	1.000000	0.984639	0.980373	0.860348	0.886267	-0.948159	0.884529
MOBPAY	0.913468	0.823088	0.984639	1.000000	0.956469	0.859206	0.868466	-0.948454	0.873739
WEBPAY	0.878217	0.782589	0.980373	0.956469	1.000000	0.779978	0.820152	-0.889808	0.810544
M2	0.971794	0.982210	0.860348	0.859206	0.779978	1.000000	0.957787	-0.941759	0.989235
FXR	0.948464	0.953397	0.886267	0.868466	0.820152	0.957787	1.000000	-0.976818	0.958778
FDS	-0.956978	-0.917547	-0.948159	-0.948454	-0.889808	-0.941759	-0.976818	1.000000	-0.944111
CPS	0.975545	0.979497	0.884529	0.873739	0.810544	0.989235	0.958778	-0.944111	1.000000

Source: ***Eviews 8***

The correlation matrix which seeks to determine the correlation between the independent variables shows that the lowest correlation is between ATM and FDS (-9.17547) while the highest is between POS and MOPAY (0.984639).

Table 3 OLS Analysis

Dependent Variable: CIC
Method: Least Squares
Date: 04/04/23 Time: 12:12
Sample: 2009 2021
Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1938.779	529.0385	3.664722	0.0215
ATM	0.117270	0.104954	1.117347	0.3264
POS	-0.204080	0.204770	-0.996631	0.3753
MOBPAY	-0.191300	0.115197	-1.660630	0.1721
WEBPAY	0.651975	0.265362	2.456925	0.0699
M2	0.004190	0.039919	0.104965	0.9215
FXR	-13.19007	5.583980	-2.362127	0.0775
FDS	-0.719416	0.315952	-2.276979	0.0851
CPS	0.052349	0.034794	1.504565	0.2069

R-squared	0.993011	Mean dependent var	2040.968
Adjusted R-squared	0.979034	S.D. dependent var	606.4040
S.E. of regression	87.80566	Akaike info criterion	11.99409
Sum squared resid	30839.33	Schwarz criterion	12.38521
Log likelihood	-68.96158	Hannan-Quinn criter.	11.91370
F-statistic	71.04354	Durbin-Watson stat	2.693506
Prob(F-statistic)	0.000482		

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The model is given as:

CIC = 1938.77910456 + 0.117269694101*ATM - 0.204079899424*POS - 0.191299963915*MOBPAY + 0.651975244187*WEBPAY + 0.00419012339889*M2 - 13.190071476*FXR - 0.719416454022*FDS + 0.0523491476078*CPS

The result shows that ATM transaction has positive (0.117270) and insignificant relationship (prob=0.3264) with currency in circulation. POS transactions has negative (-0.204080) and insignificant relationship with currency in circulation. Mobile transactions (MOPAY) also showed a negative (-0.191300) and insignificant relationship with currency in circulation. Web transactions has positive (0.651975) and insignificant (prob=0.0699) relationship with currency in circulation. Broad money supply (M2) has positive (0.004190) and insignificant (prob=0.9215) relationship with currency in circulation. Foreign exchange rate (FXR) has negative (-13.19007) but insignificant (prob=0.0775) relationship with currency in circulation. Fiscal deficit/surplus (FDS) equally showed a negative sign (-0.719416) and insignificant (prob=0.0851) relationship with currency in circulation. Credit to the private sector showed a positive sign (0.052349) and insignificant (prob=0.2069) relationship with currency in circulation.

The coefficient of determination (R^2) is 99.30%, which suggests that the model is strongly fitted. The **adjusted coefficient of determination (R^{-2}) of** 97.9%, which indicates that 97.9 percent of the total variation found in currency in circulation, is explained by the presence of the independent variables which makes more sense. The F-statistics showed a value of 71.04 with prob value of 0.000482 which is less than 0.05% level of significance indicating that all the variables jointly impacted on currency in circulation.

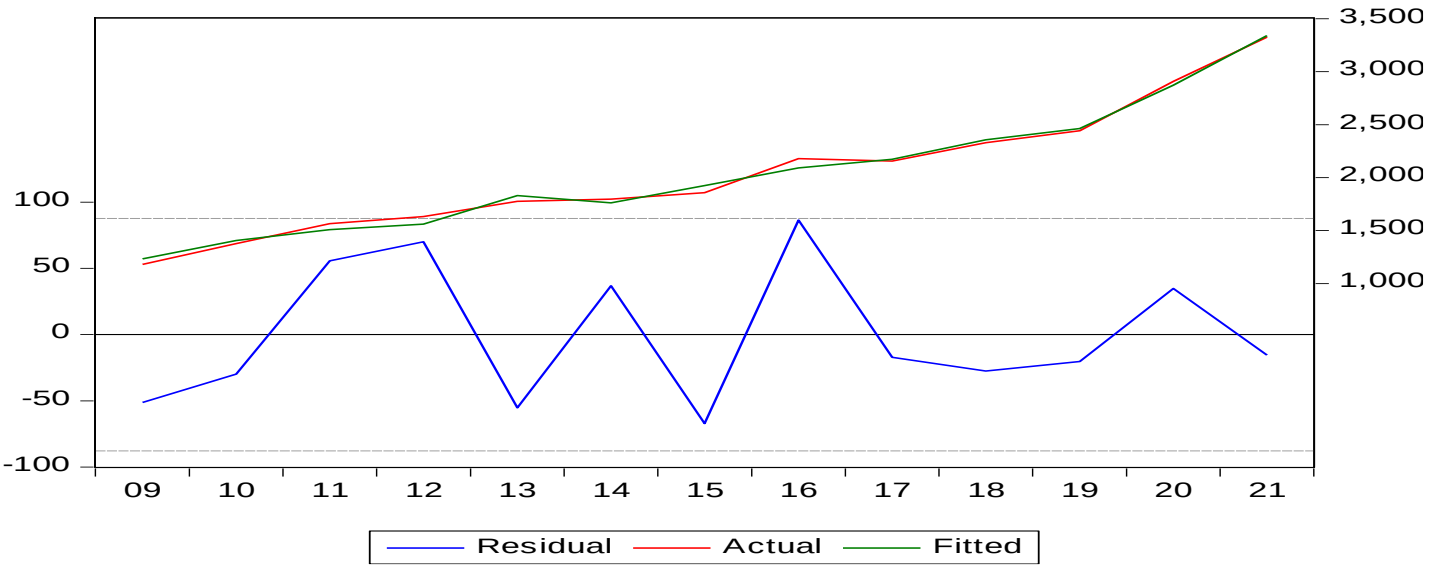

Figure 2: ***Residual Graph of Fitness***

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Table 4: Granger causality test

Pairwise Granger Causality Tests
Date: 04/04/23 Time: 12:11
Sample: 2009 2021
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
ATM does not Granger Cause CIC	11	4.21253	0.0720
CIC does not Granger Cause ATM		11.2922	0.0092
POS does not Granger Cause CIC	11	3.54866	0.0961
CIC does not Granger Cause POS		0.03894	0.9621
MOBPAY does not Granger Cause CIC	11	7.11928	0.0261
CIC does not Granger Cause MOBPAY		1.58577	0.2800
WEBPAY does not Granger Cause CIC	11	7.49606	0.0233
CIC does not Granger Cause WEBPAY		0.12964	0.8808
M2 does not Granger Cause CIC	11	0.40774	0.6823
CIC does not Granger Cause M2		2.02415	0.2129
FXR does not Granger Cause CIC	11	0.14720	0.8661
CIC does not Granger Cause FXR		1.44805	0.3068
FDS does not Granger Cause CIC	11	1.82309	0.2407
CIC does not Granger Cause FDS		0.84855	0.4737
CPS does not Granger Cause CIC	11	0.34067	0.7242
CIC does not Granger Cause CPS		3.12374	0.1176

The regression analysis deals with the dependence of one variable on the other variable which makes it imperative to find out further if the various variables cause each other to change in what direction. Thus, the granger causality test is employed to determine in what direction changes in the independent variables causes currency in circulation or whether currency in circulation actually influences the independent variables. The data were further subjected to granger causality test to find out the causality relationship between the variables. As shown in the table 4, analysis indicates that there is granger causality between ATM transactions and currency in circulation. In addition, there is also granger causality relationship between mobile transactions and currency in circulation. In other words,

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the amount of currency in circulation could actually determine whether ATM and mobile banking are used.

4.1 Discussion

It is evident from the analysis that the use of POS, Mobile banking, reduction in government excessive spending and stability in exchange rate value with reduce high volume of currency in circulation. These factors are likely possible determinant in the success of cashless policy. Although the other variables which includes ATM, WEBPAY, M2, CPS showed positive effect on currency in circulation, that of ATM shows no surprises since its mostly concerned about withdrawals thus pushing more money into circulation as less number of people actually use ATM for transfer owing to poor knowledge in the usage, fear of insecurity and easy access to the use of mobile phones for transfer. Equally important from the analysis is the fact that all the independent variables have no significant impact on currency in circulation as a unit but jointly impacted when combined as a force. The results therefore suggests two things, which are (1) they are all needed to be put in place before cashless policy can achieve success in Nigeria (2) other factors which were not considered in this study may need to be looked into for its success. Some of these factors are the political will, banks themselves and the banking customers. For example the recent cashless policy adopted in January 2023 caused an upheaval due to poor and hasty implementation, lack of political will by some governors and political gladiators who saw it as way of influencing their ability to spend cash at will and the banks who were sabotaging the system.

5. Conclusion

Cashless policy of the CBN has a lot of benefits and challenges; while the policy is a good one in moving forward, it has several huddles it must actually pass through if it must be welcomed by all and sundry. The essence of cashless policy has been debated over and over again yet in summary it is to reduce the amount of cash in circulation, reduce corruption, encourage digital banking, reduce cost of baking operations, reduce the amount government spends on producing currency notes, and to bring about financial inclusion for the people in the rural areas. From the findings in this study, it is obvious that several issues needed to be factored by the CBN for its current cashless policy to be welcomed by the banking populace. This study has shown that POS, Mobile banking, exchange rate and fiscal policy of the government have reducing effect on cash which must thus be given adequate consideration. In addition, ATM remains a means of cash withdrawal which is not surprising with the decision of the CBN to limit daily cash withdrawal from the ATM as it actually pumps in moiré cash into the economy rather than reduce it.

5.1 Recommendations

i. Cashless policy is good in its entirety, as it reduces government expenditure on currency minting, consumption and cost of banking operations. Government should factor in these variables which, from the findings, reduce currency in circulation, in cashless policy formulation.

ii. CBN policies bordering on operational conduct of end service providers like the POS operators should be sacrosanct enough, so that it will be impossible for anyone to void it at will.

iii. Infrastructural deficit is an observed bane of the cashless policy. The success and long run sustainability of the policy will anchor on the availability of the enabling infrastructure – technology, manpower, electricity etc.

iv. CBN should drive aggressive digital literacy as basic computer appreciation is necessary for the huge population to navigate to the digital world.

v. Government should address the problem of exchange rate instability and money supply

system. Further concern should be extended to credit to the private sector and cash available to the POS operators.

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