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CASHLESS POLICY AND ECONOMIC GROWTH IN NIGERIA

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Abstract

This study investigated the influence of Nigeria's cashless policy on economic growth using quarterly time series data from 2009 to 2022 on Real Gross Domestic Product, the values of Automated Teller Machine transactions, Point-of-Sale payment, web Payments and Mobile Payment from the statistical bulletin of Nigeria's apex bank. The principal analytical technique was an Error Correction Mechanism - ECM. The results revealed a positive and insignificant association between Nigeria's economic growth and automated teller machine transactions. Nigeria's economic growth is positively and significantly correlated with mobile payment usage. Point-of-sale and Nigeria's economic growth have a negative and negligible association. Throughout the study period, there was a negative and substantial association between Web Payment and Nigeria's economic growth. The findings of this study suggested that the relationship between channels of cashless policy and economic growth in Nigeria varies, as it could be positive (automated teller machine transactions and mobile payment) or negative (point-of-sale and web payment). That is, there is no clear cut prediction on the association between Nigeria's economic growth and channels of cashless policy. Accordingly, Nigeria's cashless policy, particularly with regards to automated teller machine transactions and mobile payment patterns have been a veritable tool in influencing the country's economic progress. The study therefore recommended that the Nigeria's highest bank should try and encourage deposit money banks to deliver excellence e-payment channel services to those banking with them. At the same time, the highest bank should enlighten the populace more on the essentials of the

cashless system. This is because a raise in the level of public enlightenment will mitigate confrontation by those doing business with the banks so that the benefits of the policy which include the enhancement of banks' revenue and achievement of adequate economic growth in Nigeria will be enjoyed by inhabitants of the country.

Keywords: Cashless Policy, Economic Growth, ATM, PoS, ECM, Nigeria

INTRODUCTION

It is the responsibility of the Central Bank of Nigeria (CBN) to put in place measures to control the amount, price, availability and direction of credit and money in an economy to attain some listed objectives of macroeconomic policy. In other words, the CBN must make a conscious effort to control money supply and conditions of credit in order to achieve general economic objectives including sufficient economic growth. In order to achieve a meaningful economic growth through efficient payment systems, the CBN introduced cashless policy in 2012. The policy, aimed at increasing the quantity of electronic-based transactions (payments for products, services, transfers, etc.) and decrease, but not completely eliminate, the number of notes (cash) in use. That is to say, the policy's primary goal was to decrease the quantity of naira notes and coins (cash) utilized by businesses, not to completely do away with Cash (CBN, 2012).

In the year 2012, the uppermost bank in Nigeria also posited that the introduction of a policy that encourages less cash usage in Nigeria to propel the advancement and modernization of the nation's payment infrastructure, as a functional and cutting-edge system of exchange is a critical facilitator of economic expansion and is positively correlated with economic improvement. Similarly, by offering more effective transaction choices and a wider reach, cashless policies will promote financial inclusion and lower the cost of services rendered by banks, chiefly the price of credit. Cashless policies will also increase the efficiency of monetary policy in controlling inflation and promoting economic expansion (CBN, 2012).

Truly, a system of payment that is efficient with a minimum usage of cash as it is observed in the developed economies will improve economic growth and development. This corroborates that cashless programme can serve as a tool of economic growth if implemented effectively and efficiently (Agbada & Osuji, 2021). A report by World Bank in 2012 acknowledged that non-cash payments facilitate easier and faster dealings, help businesses to trade on goods and services quickly and on time supply money into the system; in that way contribute hugely to economic growth.

According to the Central Bank of Nigeria's report in 2013, investors anticipated a lot of gains from a better application of electronic system of payment. Regarding consumers as a case in point, an upsurge in the usage of electronic systems of transactions was expected to elevate suitability, service preferences, lower the danger of crimes that are associated with cash, more affordable entrance to (out-of-branch) services of banks, easier credit availability and inclusiveness of finance. For corporations, the benefits of increased use of e-payment systems include ability to get capital on time, mitigate leakages of income and see to it that the cost of cash management is reduced. To the government, the gains of better use of e-payment systems comprise improvement in the collection of taxes, more financial inclusiveness and sufficient economic growth (CBN, 2012).

In addition, different from the physical money, without physical cash transactions have several good sides. One good side is the mitigation of thefts and other crimes linked to physical money transactions (Armey, Lipow, & Webb, 2014; Grzelczak & Pastusiak, 2020). At the same time, transactions that are initiated without physical money are also advantageous to contractors. The numerous accessible payment forms boost their income, which advances the efficiency of their operational and mitigates costs associated with operations. In 2012, Paul and Friday considered cashless payments to be hygienic for food sellers. Payments instruments that are electronic in nature have meaningful influence in the progress of production, consumption, domestic output and employment level.

According to Zandi, Koropeckyj, Singh and Matsiras (2016), payment systems that are electronic in nature have advantageous influence on finances and making of unwavering and business environment that is open. Zandi, et al. (2016) further argued that e-money payments have helped to improve the variety of shadow economy and unregistered notes expenses. Because of this, an upsurge in revenues from taxes may be observed, as well as a decline in the cost handling physical money, payment guarantees for retailers and the coverage of financial services by more consumers which in turn can have a meaningful influence on economic growth.

Moreover, there are three channels through which cashless policy can influence economic growth. Firstly, cashless payments offer consumers instant credit, making it easier for them to buy goods cum services. Consequently, it will boost consumption of private individuals and influence output growth meaningfully. Secondly, minimum physical money payments will make lesser the costs linked to money transactions; this will make the costs of operation cum achievement of economies of scale among the merchants to be low. Interestingly, the outcome of this will be expansion of investment in the economy, in so doing it will enhance the growth of the economy. In like manner, government outlay channel of minimum physical cash transaction

method is revealed indirectly by Kearney and Schneider (2011), in that this method of payment makes the collection of tax by the government to be easier. Hence, minimum physical cash transaction methods increase the government's fiscal balance and make more incomes available for pro-growth initiatives, thereby increasing economic growth.

Even with the growth enhancing ability of cashless policy, the economy of Nigeria has not documented an ample output growth. For instance, the economy was under pressure in 2016. Among other things, poor crude oil production, price shocks, a lack of foreign cash, and an energy deficit severely limited the real sector's ability to operate. As a result, the economy shrank; preliminary figures showed that the Real Gross Domestic Product - RGDP, calculated using 2010 constant base prices, fell by 1.5% in contrast to 2.8% growth in 2015. The output of non-oil and oil sectors dropped accordingly by 13.7 and 0.2% (CBN, 2016).

In the year 2017, there was an insignificant improvement of the economy. When compared to the 1.58% decrease in 2016, the Real Gross Domestic Product increased by 0.83% when assessed at constant basic prices from 2010. Also, when compared to the 0.8% growth in 2017, the real Gross Domestic Product (GDP) increased by 1.9% in 2018 when assessed at 2010 constant basic prices. The economy recorded a modest growth in 2019. At 2010 constant basic prices, the Real Gross Domestic Product (RGDP) increased by 2.3% (CBN, 2017, 2018 and 2019).

Additionally, empirical investigation regarding the influence of cashless policy on the growth of output has made available results that are conflicting or mixed. While some investigations including Hasan, Renzis and Schmiedel (2012), Grzelczak and Pastusiak (2020), as well as Tran and Wang (2023), produced evidence of a meaningful positive impact of cashless policy on economic growth, others including Park (2012) showed the system of not using physical money in business dealings helps in mitigating the occurrence of corruption, this enhances the growth of output. Also, an empirical study by Ezuwore-Obodoekwe, Eyisi, Emengini and Chukwubuzo (2014) showed that the move from physical money to non-physical money in business dealings will destroy the autonomy the central bank has. If this autonomy is destroyed, the ability of the central bank to control the supply of money will be lost; at that point the economy will witness a rise in inflation which in turn will negatively affect output growth (Al-laham, Altarawneh, & Abdallat, 2009). In the light of the above, there is no incontestable affirmation on how the use of non-physical money policy will influence an economy.

Therefore, the variation in empirical outputs regarding the influence of non-physical money policy on economic growth is of thoughtful perturbed, particularly to Nigeria. This is the reason for an essential question: what is the association between channels of cashless policy and economic growth in Nigeria. An attempt to provide an answer to the above question was the

real reason of this research. This research work was guided by the following null and alternative hypotheses: H_o1: There is no significant relationship between variables of cashless policy (the values of Automated Teller Machine transactions, Point-of-Sale payment, web Payments and Mobile Payment) and economic growth (Real Gross Domestic Product) in Nigeria. $H_1 1$: There is a significant relationship between variables of cashless policy (the values of Automated Teller Machine transactions, Point-of-Sale payment, web Payments and Mobile Payment) and economic growth (Real Gross Domestic Product) in Nigeria.

LITERATURE REVIEW

This section of the paper presents the thoughts of previous scholars. In this case, the goal is not to obtain all the available information on the topic of "cashless policy and economic growth in Nigeria" but rather to obtain and provide citations that are relevant to this study. This was done under the following sub-sections: theoretical review, conceptual clarification, stylized facts on all the variables and empirical literature.

Theoretical Review

Quantity Theory of Money (QTM)

This theory states that variations in the size of money will generate a proportionate change in the price level and in the same direction. That is, this theory is concerned with how changes in the quantity of money affect the behaviour of various economic agents. Supporting this, Madugba (2020) argued that this theory advocates that prices in the economy have advantageous influence on the size of money that is circulated in the economy. Gbosi (2005) submitted that during the first two decades of the last century, the quantity theory of money was modified and extended and essentially attained its present form. Several economists contributed to the improvement and among them Irvin Fisher, 1887-1947 for many years at Yale University is well known (Gbosi, 2005). The central idea underlying the modern theory is a very simple one. According to this theory, every transaction involves the exchange of money for something else and must have two sides to it. On one side, we have units of money and on the other side are the goods exchanged against money.

Following this line of thinking, in a cashless economy, business dealings are done not with physical money. Hence, business dealings are made using pathways of business dealings including the machine for Automated Teller and banking that uses Web. This theory is useful in this study because one of the reasons that induced the Nigerian apex bank to put forward this policy was to bring down the quantity of cash (money) and its cost (Madugba, 2020). In addition, the quantity theory of money was adopted by Ibe and Odi (2018), as well as Madugba (2020) in

their studies that relate to this paper. This theory has advantageous and direct association with the policy - policy regarding minimum usage of physical money in the country.

In addition, the influence of this policy on an economy can also be scrutinized using the theory of diffusion improvement. This idea first surfaced in 1962, and Rogers (1995) developed it. According to the notion, human connection through interpersonal networks is what leads to the adoption of a new concept or invention. In this situation, the adoption of cashless payment methods should take place where customers look for convenience and improvement and businesses look for fresh revenue streams. Grzelczak and Pastusiak (2020) argued that the effects of cashless payment spread rely on society's readiness to adopt cashless payments rapidly at different points in the process of novelty comprising to make know the availability of the policy, trust in the benefits of the policy, the willingness to accept the policy, as well as it implementation.

Conceptual Clarification

One of the functions of money is that it (money) serves as a medium of exchange. We can use money in it physical form to buy the goods and services we want, instead of exchanging one good for another as was practiced in a “Barter Economy”. However, in a cashless economy, transaction base on cash is at the smallest amount (Marco and Bandiera, 2004; Roth, 2010 and Madugba, 2020). According to Gbanador (2023), the purpose of non-physical money policy is not to completely do away with physical money in the country. In other words, the goal of a cashless policy is to promote more transactions that are electronically based and minimizing, not completely eradicating, the quantity of physical money in circulation. Therefore, the rationale behind the introduction of cashless policy is to minimize the use of physical money by making available other methods of effecting transactions. Equally, the idea of the policy is to ensure limited number of physical money in the economy but not to stop the use of it completely. There are three channels through which cashless policy can influence economic growth. These channels are: consumption channel, investment channel and government spending channel.

The advantages of minimum physical cash usage policy include it improvement in the management of the conditions of the economy (Cobb, 2004, CBN, 2012 & Madugba, 2020). Also, Gbanador (2023) argued that one of the advantages of cashless policy is that it makes ready other techniques of ensuring that transactions are consummated unaccompanied with material cash. The reasons for the introduction of cashless policy by the Nigerian apex bank include to; lower the risk of robbery, lower the enormous costs associated with handling cash (printing, storing, processing, distributing, etc.), enable more transparency in payment systems,

increase convenience and access to payment (more payment options) and enable the nation achieve its Vision 2020 objective. The avenues available for inhabitants of a country to perfect transactions in an economy where physical money is discouraged in business dealings include; Automated Teller Machine - ATM, Point-of-Sale - PoS, web and Mobile Payments. These payment channels are hereby discussed in turns.

Stylized Facts on Automated Teller Machine (ATM) Transactions

Banks used this device to carry out simple services including to withdraw money, deposit money, transfer money, pay bills, check account balance and etcetera. With these instruments, bank account holders can enjoy outdoor banking services (Gbanador, 2023). Account holders can use the card at the machine (ATM) to effect transactions. To access cash, you must enter your personal identification number (PIN) and credit or debit card. Certain ATMs enable bill payment, deposits, and cash withdrawals. Automated Teller Machines (ATMs) continued to be the most popular e-payment channel in 2011, according to data from the Central Bank of Nigeria (CBN) on a variety of e-payment channels. These machines accounted for 97.8% of all transactions. At the end of December 2011, there were 9,640 ATMs, and the capacity and worth of dealings were ₦347,569,999, as well as ₦1, 561.75 billion, respectively. These numbers reflected 86.7 and 63.7 percent increase correspondingly over the capacity and worth of 186,153,142 and ₦954.04 billion, by December, 2010 ending (CBN, 2011).

A breakdown of e-payment channels in 2013 revealed that Automated Teller Machines **(**ATMs) recorded in percentage of 91.3 of the aggregate size. In numerical term, ATMs used as reported at the end of December, 2013 were 12,755, signifying increases of 18.9 percent exceeding the figure recorded during the end of December, 2012 which was 10,727. The worth of transactions via ATMs moved in an upward manner by 42.5 percent to ₦2,828.94 billion, from the level of ₦1,984.65 billion in the former period, while in 2012 December ending, the size dropped by 21.4 per cent to 295,292,940 from 375,487,756. The drop in capacity was credited to the upsurge in the supreme quantity of withdrawal from ₦20, 000 to ₦40,000 per transaction (CBN, 2013).

In 2014, analysis of the contribution of the payment channels revealed that Automated Teller Machines **(**ATMs) accounting for 88.1 percent of the aggregate. Regarding worth, in percentage, ATMs worth was 83.5 per cent. By December ending, the quantity of ATMs brought into service by December, 2014 ending was 15,935, signifying 24.9 per cent rise exceeding the 12,755 of December, ending 2013. Transactions done via ATMs improved in both size and worth by 35.5 and 30.0 per cent to 400,102,507 and 3,679.9 billion, individually, by December, 2014 ending (CBN, 2014). The number of Automated

Teller Machines (ATMs) utilized was 16,406 by December, 2015 ending, this shows increases of 3.0 per cent beyond the 15,935 of December, 2014 ending. The size and worth of transaction done via ATMs improved by 8.4 and 7.9 per cent to 433,587,623 and ₦3,970.3 billion by December, 2015 ending, correspondingly, from ₦400,102,507 and ₦3,679.9 billion by December, 2014 ending (CBN, 2015).

Moreover, the number of Automated Teller Machines employed by December, 2016 ending remained 17,398, showing six per cent growth beyond 2015 value of 16,406. Equally, the size and worth of dealing of ATMs moved upward by 36.1% and 25.6% to 590.2 million and ₦4,988.1 billion, correspondingly, from 433.6 million and ₦3,970.30 billion in 2015 (CBN, 2016). The number of Automated Teller Machines employed in December, 2017 ending remained 17,449, showing a growth of 0.3%, juxtaposed with the 17,398 documented in December, 2016 ending. ATMs dealings grew in both size and worth by 35.6 and 29.1 per cent, to 800,549,099 and ₦6,437.6 billion, separately, in December, 2017 ending, juxtaposed with 590,238,934 and ₦4,988.1 billion in December, 2016 ending (CBN, 2017).

In addition, the number of Automated Teller Machines employed remained at 18,615 December, 2018 ending, revealing a growth of 6.7 per cent, juxtaposed with the 17,449 in December, 2017 ending. ATMs dealings grew in both size and worth by 9.4 and 0.7 per cent, to 875.5 million and ₦6,480.1 billion, correspondingly, in December, 2018 ending, juxtaposed with 800.5 million and ₦6,437.6 billion in December, 2017 ending (CBN, 2018). Also, the number of Automated Teller Machines employed stayed at 19,129 in December, 2019 ending, showing a growth of 3.0 per cent, juxtaposed with 18,615 recorded in December, 2018 ending. The bulk of ATMs dealings went down by 4.1 per cent to 839.8 million, juxtaposed with 875.5 million documented in 2018, whereas there was a marginal rise in worth by 0.5 per cent to ₦6,512.61 billion, juxtaposed with ₦6,480.10 billion documented in the earlier year. The fall in size or capacity was ascribed to growth in the approval of automated funds movement or via other pathways, as a payment means, rather than money withdrawal for business dealings (CBN, 2019). In 2021, the value of transactions across most e-payment channels including Automated Teller Machines (ATMs) exposed a growth beyond their corresponding levels in the year 2020. An investigation of the pathways of payment that is electronic in nature in 2021 displayed that volume of transactions on ATMs accounted for 9.8 percent.

Stylized Facts on Point of Sale (PoS) Transactions

This instrument assists people to make payment for goods, as well as services with the aid of a bank card. It is used in different places including markets, gas stations, boutiques and

etcetera. This instrument is one of the legal means of perfecting business dealings amongst urban and rural inhabitants. The point of sale (POS) is an electronic payment system that requires the holder of the card to insert his or her bank's card into the instrument, input the amount to be debited and his personal identification number (PIN), and press OK (enter) to complete the operation. After the transaction is done, the instrument will print receipts (Gbanador, 2023)

In the year 2011, data on various e-payment channels indicated that Point-of-Sale (PoS) services accounted zero point six per cent. In terms of worth, PoS services recorded 1.9% in 2011 (CBN, 2011). A breakdown of e-payment channels in 2013 revealed that POS accounted for 2.9 percent of the total volume. In 2013, the bulk and worth of the instrument improved in billions to 9,402,255 and ₦161.02, from 2,555,045 and ₦48.01 in 2012, demonstrating improvement in percentages of 267.99 and 235.39, correspondingly (CBN, 2013). The bulk and worth of its dealings improved in billions to 20,817,423 and 312.1, from 9,402,255 and 161.02 in 2014, showing a improvement in per cent of 121.4 and 93.8, individually. The improved achievement was credited to growing public responsiveness and sureness in the usage of this pathway of payment (CBN, 2014).

In 2015, size and worth of the instrument improved in billions to 33,720,933 and ₦448.5 beyond the 20,817423 and ₦312.1 billion documented in the year 2014, signaling growth in percentages of 62.0 and 43.7, individually. This happened because the inhabitants high level of confidence in this technique of payment (CBN, 2015). The size and worth of it improved by percentages of 89.0 and 68.2 to 63.7 million and ₦759.0 billion, correspondingly, in 2016, compared with 33.7 million and ₦448.5 billion in 2015. The development was attributed to increased public confidence in the use of the channel (CBN, 2016).

In 2017, its size and worth improved in billions to 146,267,156 and ₦1,409.8, juxtaposed with billions of 63,715,203 and ₦759.0 in 2016, individually, demonstrating growth in percentages of 129.6 and 85.8. High level of confidence by the inhabitants of the country in this technique of payment was the reason for the growth (CBN, 2017). Its size and worth improved in percentages of 102.3 and 69.0 to 295.9 million and ₦2,383.1 billion, individually, by December 2018 ending, juxtaposed with 146.3 million and ₦1,409.8 billion, in 2017. It encouraging performance was because of the high level of confidence displayed by the inhabitants of the country in this method of completing business dealings (CBN, 2018). In addition, its size and worth improved in percentages of by 48.2 and 34.5 to 438.6 million and ₦3,204.75 billion, correspondingly, by December, 2019 ending, juxtaposed with 2018 figure of 295.9 million and ₦2,383.10 billion (CBN, 2019).

Stylized Facts on web Payments (Transactions)

Available data on various e-payment channels for the year 2011 indicated that web payments accounted for 1.0 per cent. In value terms, web payments accounted for 3.5 per cent in 2011 (CBN, 2011). An itemization of technique of payment in 2013 revealed that web (internet) made 0.9 percent of the total volume. The size and worth of dealings on it improved to 2,900,473 and ₦47.32 billion, from 2,276,464 and ₦31.57 billion in 2012, conveying a growth in percentages of 27.4 and 49.9, individually (CBN, 2013). In 2014, the size and worth of it dealings improved to 5,567,436 and 74.3 billion from 2,900,473 and 47.3 billion in 2013, displaying a growth in percentages of 91.9 and 57.1, correspondingly (CBN, 2014).

In 2015, its size and worth of dealings improved to 7,981,361 and ₦91.6 billion beyond 5,567,436 and ₦74.3 billion documented in 2014, revealing a growth in percentages of 43.4 and 23.3, individually (CBN, 2015). It worth and size of settlement improved in percentages of 75.0 and 44.5 to 14.0 million and ₦132.4 billion, individually, in 2016, juxtaposed with 2015 figure of 8.0 million and ₦91.6 billion (CBN, 2016). In 2017, it worth and size of dealings improved to 28,991,097 and ₦184.6 billion, juxtaposed with the 2016 figure of 14,088,247 and ₦132.4 billion, correspondingly, signifying growth in percentages of 105.8 and 39.4 (CBN, 2017).

Interestingly, its worth and size of dealings improves in percentages of 75.2 and 119.2 to 50.8 million and ₦404.6 billion, correspondingly, by December, 2018 ending, juxtaposed with 29.0 million and N184.6 billion by December, 2017 ending (CBN, 2018). In 2019, its worth and size improved in percentages of 103.7 and 18.2 to 103.5 million and ₦478.14 billion, individually, juxtaposed with 50.8 million and ₦404.60 billion by December, 2018 ending (CBN, 2019).

Stylized Facts on Mobile Payment

Available data in the year 2011 on different e-payment channels showed that Mobile Payment accounted for 0.5 per cent. Its worth and size of dealings improved in percentages of 215.6 and 185.8 from 1,156,553 and ₦6.7 billion to 3,649,374 and ₦19.0 billion, respectively, at end-December 2011 (CBN, 2011). A breakdown of e-payment channels in 2013 revealed that mobile payments accounted for 4.9 percent of the total volume. In 2013, its worth and size of dealings improved in percentages of 588.19 and 353.33 to 15,812,435 and ₦142.80 billion, respectively, from 2,297,688 and ₦31.50 billion in 2012. Increased acceptance and knowledge of mobile payments channels was cited as the reason for the notable surge in transactions (CBN, 2013).

A breakdown of the contribution of the payment channels in 2014 indicated that Web (internet) dealings made up one point two per cent of the aggregate. In 2014, the size and worth of dealings by mobile device improved in percentages of 75.5 and 137.5 to billions of 27,744,797 and 339.2, from 15,812,435 and 142.8, correspondingly, in 2013 (CBN, 2014). In 2015, its size and worth improved in percentages of by 58.3 and 30.4, individually to billons of 43,933,362 and N442.4 beyond billions of 27,744,797 and N339.2, documented in 2014 (CBN, 2015). Its size and worth improved in percentages of 7.3 and 71.1 to 47.1 million and ₦756.9 billion, correspondingly, in 2016, juxtaposed with 43.9 million and ₦442.40 billion documented in 2015 (CBN, 2016).

Its dealings improved in both worth and bulk by percentages of 1.6 and 45.7 in 2017 to billions of 47,804,561 and ₦1,102.0, individually, juxtaposed with 47,053,252 and ₦756.9 billion in 2016. The growing awareness and trust in using this channel was the main reason for the growth in transaction volume and value (CBN, 2017). Furthermore, it improved in both worth and size in percentages of 25.3 and 12.2 in 2018 to 59.9 million and ₦1,236.1 billion, correspondingly, juxtaposed with 47.8 million and ₦1,102.0 billion in 2017 (CBN, 2018). In addition, it improved in both size and worth in percentages of 333.1 and 177.5 in 2019 to 377.2 million and N5, 080.96 billion, individually, juxtaposed with 87.1 million and ₦1,831.00 billion in 2018. The meaningful improvement in worth and size of it dealings was praised because of the money products that were improved upon, high level confidence by users of this pathway of business dealings (CBN, 2019).

Importantly, in 2011, Ekine stated that the process through which a nation's actual per capita income rises over an extended length of time is known as economic growth. Ekpo (2017) argued that economic growth is the percentage change in the output or GDP over two consecutive years, or an increase in national income and product. It suggests a steady rise in aggregate product of the domestic economy over-time.

Empirical Literature

In order to study the effect of Nigeria's policy regarding minimum physical money usage on the growth of output, Yusuf (2016) gathered quarterly time series data covering Q12010 to Q42018 and employed the Ordinary Least Squares (OLS) approach. The study's conclusions informed that the policy of limited physical money has served as a true device for affecting output performance, particularly in relation to Point of Sale (POS) payment patterns and Automated Teller Machine (ATM) transactions.

Ibe and Odi (2018) used cointegration, granger causality techniques and Quarterly data covering 2009 to 2016 to investigate the impact of Nigeria’s cashless policy on economic

growth. The results of this analysis demonstrate that there is a substantial long-term correlation between Nigeria's economic growth and variables of interest - automated teller machines, point of sale payments, and mobile banking. Furthermore, given its strong correlation with GDP, ATMs appear to be the most popular and effective way to implement cashless policies. The researchers also discovered a unidirectional causation between Automated Teller Machine and economic growth. It also revealed bidirectional causality between Point of Sale payment and economic growth. Additionally, the outcome demonstrated an independent causality between mobile banking and economic growth.

Agu and Agu (2020) looked at how Nigeria's cashless policy affected the country's economic growth. Using the technique of ordinary least squares – OLS, as well as data between Q1 2010 and Q4 2018. The results showed that government policies regarding cash handling have been a real device for affecting output performance, particularly when it comes to payments made at Points of Sale (POS) and Automated Teller Machine (ATM) transactions.

With the aid of Descriptive statistics and Ordinary Least Squares techniques, Madugba (2020) studied cashless policy's influence on output in Nigeria spanning 2008 to 2018. The finding of the study revealed that Automated Teller Machine, Remita and Web banking have no noteworthy influence on output while Point of Sale payment was shown as a substantial cause of output improvement in Nigeria.

Grzelczak and Pastusiak (2020) explored the relationships between the tools of cashless payments and economic growth using Spearman's rank correlation. The authors discovered that payments made using credit cards was the major portion of all business dealings made in the countries of Central, as well as Eastern Europe, followed by payments made using transfer orders. In contrast, an increasing number of payments in Western European countries are conducted using e-money instruments, despite the fact that a significant portion of all payments were made using transfer orders and payment cards. Through the examination of reciprocal interactions, data regarding correlations between the value of payments made using certain cashless payment instruments and economic growth as shown by GDP per capita was collected. The results showed a favourable link between the worth of payments made via a credit card or order of transfer and the growth of the economies of both Western and Central European countries. In Western European countries, payments made by direct debit proved to be negligible, but payments made using e-money instruments proved to be substantial. Considering the strength of the correlations, it can be concluded that the value of payments using order of transfer with respect to actual aggregate output per capita in Western European nations has a larger positive correlation (0.80). It is only 0.48 in the nations of Central and Eastern Europe. Similar relationships exist in both sets of nations between the value of

payments made using credit or debit cards and economic expansion. What's notable is that payments made using e-money instruments have a significant influence on real GDP per capita, of roughly 0.80.

Agbada and Osuji (2021) appraised pathways of business dealings, policy regarding minimum physical usage and Nigeria's output. The study collected primary data and evaluated them via the Correlation Coefficient of Pearson Product-Moment. The findings showed a linear association between variables of payment system and economic growth. The findings also revealed that variables of cashless policy have negligible impact on economic growth.

Gbanador (2023) used quarterly time series data covering the years 2012 to 2021 and applied Autoregressive Distributed Lag (ARDL) Bounds test to explore the influence of Nigeria's cashless rule on output. The outcome informed that internet banking and cheque have a substantial link with Gross Domestic Product. Conversely, there was insignificant negative correlation found between GDP and Automated Teller Machines (ATMs). The study determined that Nigeria's economic growth is influenced by cashless policies, and as a result.

Using annual data spanning from 2011 to 2020 and the static panel method, Tran and Wang's (2023) study on the association between policy regarding pathways of business dealings and output in countries of G20, as well as Vietnam demonstrated that the policy variables including cheque dealings stimulated output.

With the aid of descriptive statistics and multiple linear regression tools, Samuel and Emenyi (2024) studied the relationship between cashless policy and economic growth in Nigeria spanning 2013 to 2022. The outcome of the analysis revealed that cashless policy variables - POS transactions and ATM transactions have contributed to the growth of output in the country although their contribution is not meaningful. At the same time, web-based transactions have a detrimental influence on the growth of output in the country.

MATERIAL AND METHODS

Data and Variables

This research work made use of quarterly time series data from 2009 to 2022 on Real Gross Domestic Product, the values of Automated Teller Machine transactions, Point-of-Sale payment, web Payments and Mobile Payment. In addition, the researchers would have loved to cover beyond the above time frame but because of paucity of data the researchers decided to cover for the period data were available. The data for this study were collected from the statistical bulletin of Nigeria's apex bank. Interestingly, all the variables are in billions of naira.

Model Specification

An econometric model was estimated for this study. Specifically, the model of Agu and Agu (2020) in their investigation of cashless policy and the Nigerian economy: A Disaggregated Approach was adapted**.** The model for this study is presented thusly:

$RGDP = F(ATMVA, POSVA, WPVA, MPVA)$ (1)

$RGDP_t = a_o + a_1ATMVA_t + a_2POSVA+ + a_1WPVA_t + a_1MPVA_t + u_t$ (2)

$LnRGDP_t = a_o + a_1LnATMVA_t + a_2LnPOSVA+ + a_1LnWPVA_t + a_1LnMPVA_t + u_t$ (3)

Where:

RGDP = Real Gross Domestic Product (in billion naira), ATMVA = Value (worth) of transactions made through Automated Teller Machines (in billion naira), POSVA = Value of transactions made through Point of sale operations (in billion naira), WPVA = Value of transactions made through Online web payments (in billion naira), MPVA = value of transactions made through mobile payments (in billion naira), u = Error Term, Ln = natural logarithm, a_o = the constant parameter, a_1, a_2, a_3 and a_4 = the slope parameters.

Theoretical Expectations: $a_1 – a_4 > 0$.

Data Analysis Technique

This study utilized quarterly time series data to examine the influence of cashless policy on economic growth in Nigeria from 2009 to 2022. Because of the non-stationary nature of monetary time series data, it is vital to test for stationarity. So that regression output will not be spurious. Therefore, this study first of all employed the Augmented Dickey Fuller (ADF) unit root test to check the order of integration of the variables in the model. Generally, the ADF is presented thusly,

$\Delta RGDP_t = \alpha_0 + \alpha_1RGDP_{t-1} + \Sigma\alpha_1\Delta RGDP_i + \delta_t + u_t$ (4)

Following the outcomes of the ADF test, this study checked for long run association using Johansen co-integration procedure. Generally given by

$RGDP_t = \mu + \Delta_1RGDP_{t-1} + - - - + \Delta P\ y_{t-p} + u_t$ (5)

At this point, co-integration was proven to exist. Then the study constructed an Error Correction Mechanism (ECM) to model dynamic relationship. The reason of the ECM is to indicate the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The vigorous ECM demonstration is specified below:

$\Delta LnRGDP_t = \beta_0 + \Sigma\beta_1\Delta LnRGDP_{t-1} + \Sigma\beta_2\Delta LnATMVA_{t-1} + \Sigma\beta_3\Delta LnPOSVA_{t-1}+ + \Sigma\beta_4\Delta LnWPVA_{t-1} + \Sigma\beta_5\Delta LnMPVA_{t-1} + \delta_1ECM_{t-1} + \mu_{1-t}$ (6)

Consider the variables as defined previously.

FINDINGS AND EXPLANATIONS

To prevent incorrect conclusions that can happen when analyzing time series data with regression, this study checked if the data is stable using the Augmented Dickey Fuller (ADF) test. The test had these assumptions: H_0 says the variable has a unit root and is not stable, while H_1 says the variable doesn't have a unit root and is stable. The results of the test are shown in Table 1.

Table 1: Unit Root Test Outcome via Augmented Dickey-Fuller *(E-views 10 output)*

Variables	Level form		First difference		Order of integration
	ADF Statistics	5% Critical Value	ADF Statistics	5% Critical Value	
RGDP	-2.075060	-3.495295	-7.319012	-3.496960	1(1)
ATMVA	-0.713425	-3.495295	-6.333902	-3.496960	1(1)
POSVA	-2.021762	-3.495295	-5.341216	-3.496960	1(1)
WPVA	-2.279167	-3.495295	-5.196105	-3.496960	1(1)
MPVA	-2.701492	-3.495295	-5.099496	-3.496960	1(1)

Note: RGDP, ATMVA, POSVA, WPVA and MPVA as defined previously

The result in Table one reveals stationary at 1(1). Given that the variables were integrated of order 1(1), we proceeded to test for long run association.

Co-integration Investigation

Table 2: Johansen Technique *(E-views 10 output)*

Eigen value	Trace Statistic	5% critical value	Prob. **	Hypothesis of CE(s)
0.330325	71.11883	69.81889	0.0393	None *
0.318103	49.46686	47.85613	0.0350	At most 1 *
0.264447	28.79155	29.79707	0.0650	At most 2
0.111183	12.20636	15.49471	0.1473	At most 3
0.102534	5.841734	3.841466	0.0156	At most 4 *

"Hypothesized No. of CE(s)" stands for "Hypothesized Number of Cointegrating Equations" and is a term used in econometrics to indicate the assumed number of long-term stable relationships (cointegrating equations) between time series variables when conducting a Johansen cointegration test. This value is part of the test output, helping to determine if the

variables have a common trend in the long run. In the Johansen cointegration test, the "Hypothesized No. of CE(s)" row shows the number of cointegrating equations that the researcher is assuming or hypothesizing at the current stage of the test. The test then uses a trace statistic to determine if there's enough evidence to reject this hypothesis and conclude that cointegrating equations exist. In essence, it helps us answer the question: How many long-term relationships are there between these time series variables?

Importantly, a careful examination of Table 2 shows that there are three co-integrating equations because three of the Trace Statistics are higher than the critical value at 5%. This means there is a long-term relationship between RGDP, ATMVA, POSVA, WPVA, and MPVA. Because of this, these variables do not drift apart over time. In other words, the null hypothesis that there is no co-integration among the variables was rejected. Since there are three co-integrating equations, the condition for using an error correction model is met. The Error Correction Mechanism (ECM) checks for the existence of a long-run relationship and includes the short-run changes into the long-run balance. The outcome of the ECM is shown in Table 3.

Table 3 Error Correction Mechanism (ECM) Outcome *(E-views 10 output)*

Regressors	**Coefficients**	**t-Statistic**	**P-Value**
DLOG(ATMVA)	0.013790	1.461381	0.1512
DLOG(MPVA)	0.043413	5.467604	0.0000
DLOG(POSVA)	-0.004763	-0.322476	0.7487
DLOG(WPVA)	-0.016002	-2.054124	0.0461
ECM (-1)	-0.107295	-1.327301	0.1914
R^2= 0.808960	**D-W stat. =** 1.835173		**Prob(F-statistic) =** 0.000000
Akaike info criterion = -6.351989	Schwarz criterion = -6.014274		**F-statistic** = 22.76053

Note: RGDP, ATMVA, POSVA, WPVA and MPVA as defined previously

The result in Table 3 reveals R^2 value of 0.808960. This shows that deviation in economic growth explained by Automated Teller Machine, Point-of-Sale, web Payments and Mobile Payment is 81%. The value of Durbin Watson is 1.835173; this means that the model is not confronted with the problem of autocorrelation. The signs of the coefficient of the ECM is right (i.e., negative).

The coefficients of Automated Teller Machine and Mobile Payments appear with the correct sign signifying a healthy association between Automated Teller Machine, Mobile Payment and aggregate output. This supports the theoretical belief. This outcome demonstrates that a percentage upsurge in Automated Teller Machine transactions and Mobile Payments will

increase economic growth (RGDP) by 0.013790% and 0.043413% respectively. This finding is consistent with the study of Agu and Agu (2020) who reported that channels of cashless policy have been veritable tools in influencing economic performance in Nigeria. The total worth of the t-statistic for the slope coefficient of Mobile Payment is noteworthy. However, the absolute value of the t-statistic for the slope coefficient of Automated Teller Machine transactions is not noteworthy. Thus, this concludes that the association between Mobile Payment and total output in Nigeria is meaningful. But such association does not exist between transactions via Automated Teller Machine and total output in Nigeria. The implication of this result is that the value of Mobile Payment significantly helped to improve total output. The result also revealed that although Automated Teller Machine influenced or encouraged economic growth but it influence was not meaningful (significant) during the period of study.

Furthermore, the coefficients of Point-of-Sale and web Payments appear with disadvantageous signs. This shows that Point-of-Sale and web Payments have unfavourable association with total output. These outcomes do not conform to the apriori expectations. The outcomes suggest that a percentage increase in Point-of-Sale and web Payments will cause a fall in total output by 0.004763% and 0.016002% correspondingly. At the same time, the worth of the t-statistic for the slope coefficient of web Payment is meaningful at 5%. Hence, this paper accepts the existence of meaningful association between web Payment and total output in Nigeria. Surprisingly, the absolute value of the t-statistic for the slope coefficient of Point-of-Sale transactions is not meaningful at 5%. Therefore, this paper concluded Point-of-Sale transactions and total output have meaningful connection in Nigeria. This signifies that though web Payment has a negative association with total output in Nigeria but if well managed it will help to stimulate total output in Nigeria.

CONCLUSION AND RECOMMENDATIONS

This paper studied the influence of cashless policy on total output in Nigeria because inhabitants of Nigeria expected so many benefits from an improved utilization of electronic techniques of payment (Automated Teller Machine transactions, Point-of-Sale payments, web Payments and Mobile Payments). Customers anticipate that as e-payment systems become more widely used, there will be more service options, convenience, a lower chance of crimes involving cash, more affordable entrance to (out-of-branch) services of banks, credit availability, and inclusion of finance. Businesses owners anticipate that using e-payment systems more frequently will speed up access to money, lower or completely eliminate income leakages, and save costs associated with managing cash. Furthermore, government expects increased use of e-payment systems to increase tax collections, greater financial inclusion and increase in

economic growth. With the utilization of quarterly data from 2009 to 2022 on Real Gross Domestic Product, value of business dealings on Automated Teller Instrument, worth of Point of Sale payments, worth of web Payments and worth of Mobile Payments from Nigeria's highest bank's yearly numerical report and the used of Error Correction Mechanism - ECM. The outcome is that though Automated Teller Machine has advantageous effect on total output but it association with total output is not noteworthy. Mobile Payment has positive and noteworthy association with total output. Point-of-Sale has negative and inconsequential association with total output. Web Payment has negative and noteworthy connection with total output. This means that the relationship between channels of cashless policy and total output in Nigeria differs, it can be advantageous (Automated Teller Instrument and Payment via mobile device) or disadvantageous (Point of Sale and Web Payment). Accordingly, the study came to the conclusion that Nigeria's cashless policies, particularly with regards to Automated Teller Machine (ATM) transactions and mobile payment patterns have been a correct instrument in affecting the country's economic progress. The study therefore suggested that the Nigeria's highest bank should try and encourage deposit money banks to deliver excellence e-payment channel services to those banking with them. At the same time, the highest bank should enlighten the populace more on the essentials of the cashless system. This is because a raise in the level of public enlightenment will mitigate confrontation by those doing business with the banks so that the benefits of the policy which include the enhancement of banks' revenue and achievement of adequate economic growth in Nigeria will be enjoyed by inhabitants of the country.

LIMITATIONS AND FUTURE RESEARCH

This paper utilized quarterly time series data from 2009 to 2022 and couldn't expand the sample period beyond 2022 due to paucity of data. In addition, it is clear that this paper doesn't cover all aspects of the study's topic. So, future research should look at a longer time period and examine how cashless policy affects poverty in Nigeria.

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