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CASHLESS ECONOMIC POLICY: AN ANALYSIS OF FINANCIAL INTERMEDIATION IN THE PRE AND POST CASHLESS POLICY PERIODS

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Abstract

An efficient and modern payment system is positively correlated with economic development, and is a key enabler for economic growth, to reduce the cost of banking services (including cost of credit) and drive financial intermediation and inclusion by providing more efficient transaction. This study examined financial intermediation in the Nigerian banking industry under the cashless policy and specifically ascertains whether significant differences exists in financial intermediation statistics (currency outside banks, demand deposits and credit to the private sector) before and after the adoption of the cashless policy in Nigeria in 2012. This study made use of monthly data handpicked from the Central Bank of Nigeria (CBN) money and credit statistics as published in the CBN website. The time frame for the study was truncated to a six (6) year period i.e. 2009 to 2014 divided into two periods (before and after the adoption of the cashless policy) for a balanced paired sample t-test statistic. Finding from the study suggests that that there is no significant difference in financial intermediation by Nigerian banks after the adoption of the cashless policy. Given the finding, the study recommends that banks in Nigeria should: strive to put in place measures that will mop up much of the currency outside the banking system, enhance and strengthen the payment system so as to encourage the use of interbank payment systems which improves on fallowing of demand deposits by customers, and reduce the stringent measures that discourages the private sector from accessing bank credits so as to encourage borrowings by the private sector.

Keywords: Cashless policy; financial intermediation; payment system; money and credit.

Introduction

An efficient payment system is imperative in the banking industry as it plays a very crucial role in any economy. The banking system is the channel through which financial resources flow from one segment of the economy to another. It therefore represents the major foundation of the modern market economy (CBN, 2011). In today's world, many people across the globe make payments electronically rather than cash based and this discourages cash transactions while enabling banks to create money for credit purposes. The financial system started as a barter economy and has moved through various incarnations in response to limitations inherent in the evolving systems (Ajayiand Ojo, 2006). This has led to a shift from the old cash handling system to cashless society, which is envogue worldwide. To this end, the world has witnessed an upsurge of electronic payment instruments meant to facilitate trade and simplify payments. Before the introduction of electronic payment into the Nigerian banking system, customers had to walk into banking halls to carry out transactions of all kinds. For many years, bankers, IT experts, entrepreneurs and others had advocated for the replacement of physical cash and the introduction of a more flexible, efficient and cost effective retail payment solution (Baddeley, 2004). Nigerian banks are making huge investments in technology to upgrade their infrastructure in order to provide new electronic information based services. Such services as online retail banking, Point of Sale terminals (POS) make it possible for individuals and corporate bodies to take advantage of new technologies at reasonable costs.

Alagh and Ene (2014) noted that the volume and value of electronic card (e-card)transactions has increased significantly from N195,525,568 and N1,072.9 billion in 2010 to N355,252,401 and N1,671.4 billion, in 2011 reflecting an increase of 81.5 and 55.8 percent respectively. The increase was attributed to enhanced public confidence in electronic card payments. In addition, data on various e-payment channels from Alagh and Ene (2014) indicated that ATMs remained the most patronized accounting for 97.8 per cent, followed byweb payments, 1.0 per cent, Point-of-Sale (POS) terminals, and mobile payments, 0.6 percent each. Similarly, in value terms, ATMs accounted for 93.4 per cent, web 3.5 per cent,POS 1.9 per cent and mobile payments, 1.2 per cent. The number of ATMs stood at 9,640,while the volume and value of transactions amounted to 347,569,999 and N1, 561.75 billion, at end-December 2011, respectively. These figures reflected increases of 86.7 and 63.7 percent respectively over the volume and value of 186,153,142 and N954.04 billion, atend-December 2010 (Alagh and Ene, 2014). The volume and value of mobile payments increased by 215.6 and185.8 per cent from 1,156,553 and N6.7 billion to 3,649,374 and N19.0 billion, respectively, at end-December 2011. However, irrespective of these notable increases in volumes and values utilizing the e-payment channels, the CBN money and credit statistics (financial intermediation statistics including reduction in currency outside the banks, increase in demand deposits as well as bank credit) fails to record significant gains. It is expected that the increase in the usage of e-payment solutions of ATM, POS, mobile money etc will greatly reduce the currency outside banks but available monthly statistics shows that currency outside the bank recorded increasing rates in growth in 2014 of 0.12%, 6.41%, 2.32%, 3.86% and 11% in the months of March, June, August, October and November respectively. Year 2014 also reports negative growth in rates in demand deposits of -2.36%, -2%, -4.16%, -0.86%, -2.18% and -10% for months of April, May, July, September through November respectively. Given these, banks credit to the private sector failed to increase above 1.7% throughout 2014 while specifically recording growth rates of less than 1% of -0.24%, 0.85% and 0.10% in April, July and November respectively. Thus, these imply that the cashless policy is not yielding the desired result in financial intermediation. Hence, this study examines financial intermediation in the Nigerian banking industry under the cashless policy and specifically ascertains whether significant differences exists in financial intermediation statistics (currency outside banks, demand deposits and credit to the private sector) before and after the adoption of the cashless policy in Nigeria in 2012.

A cashless payment system is a form of financial exchange that takes place between the buyer and seller facilitated by means of electronic communication. The Central Bank of Nigeria (CBN) introduced the cashless policy in April 2011 with the objective of promoting the use of electronic payment channels instead of cash. According to CBN (2011), the new cash policy was introduced for a number of key reasons, including: to drive development and modernization of our payment system in line with Nigeria‘s vision 2020 goal of being amongst the top 20 economies by the year 2020 given that an efficient and modern payment system is positively correlated with economic development, and is a key enabler for economic growth. An efficient and modern payment system is expected to reduce the cost of banking services (including cost of credit) and drive financial inclusion by providing more efficient transaction options and greater reach and to improve the effectiveness of monetary policy in managing inflation and driving economic growth, in addition, the cash 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 & corruption (CBN, 2011). According to Cobb (2004), the value of electronic payment goes way beyond the immediate convenience and safety of cards to a greater sphere of contributing to overall economic development. Consequently, this is expected to enhance efficient financial intermediation. Undoubtedly the last three decades have witnessed major advancement in payment technologies as Nigeria electronic payment (e-payment)landscape is on a new threshold with banks, switching and transaction companies, vendors of Automated Teller Machine (ATMs), Point of sale (POS) and third party companies all jostling to expand the scope of market. Thus, these imply that the cashless policy is expected to result in enhanced and efficient financial intermediation thereby bringing about a reduction in currency outside banks while increasing demand deposits as well as credit to the private sector. Hence, this study examines financial intermediation in the Nigerian banking industry under the cashless policy and specifically tends to ascertain whether significant differences exists in financial intermediation statistics (currency outside banks, demand deposits and credit to the private sector) before and after the adoption of the cashless policy in Nigeria in 2012.

Review of Related Literature

Overview of Cashless Policy in Nigeria

Money is often described as having three functions: (i) a unit of account function, (ii) a medium-of-exchange function, and (iii) a store-of-value function. In a cashless economy, the third is not operative and, probably, neither is the second. Cashless economy is a global issue apart from the fact that Nigeria just launched itself into the system. Cashless economy does not refer to an outright absence of cash transactions in the economic setting but one in which the amount of cash-based transactions are kept to the barest minimum (Yaqub, Bello, Adenuga and Ogundeji, 2013).

According Adewale (2013) a cashless society rightly illustrates a gradual movement of the entire payment system of an economy from the use of physical cash for all levels of personal, corporate, governmental including local and international commercial settlement activities to a systematic adoption of other non-physical cash mode payment in settlements of all types of transaction both in the public and private sectors of an economy. It is an economic system in which transactions are not done predominantly in exchange for actual cash (Daniel, Swartz and Fermar, 2004).

However, as much as there is the need to change into a society where cash will no longer be dominant in the payment system, proponents of cash money have on the other hand claim that in the developing and the underdeveloped nations physical cash money is still the most convenient means of settlement of transactions as a result of illiteracy, and Nigeria is very guilty in this regard. In a Nation with over 150 Million inhabitants, the proponents of a cashless society in Nigeria argued that it will aid in the drastic reduction in money laundering, terrorist financing and other economic and financial crimes (Soyemi, Soyemi and Hammed, 2015). Others believe that a cashless society will encourage financial inclusion for most Nigerians since less than 30 per cent of bankable Nigerian adults own bank accounts. A larger percentage of the population rather keeps their money under their mattresses, in their pockets and probably in old cooking pots (Nahimah, 2012; Abimbola, 2012; and Adanna, 2011).Scholars also opined that a cashless Nigeria will promote and implement realistic monetary and fiscal policies that will reduce inflation and encourage investments (Adanna, 2011; and Nnamdi, 2011).

A cashless society possesses the following characteristics; all the money used is issued by private financial institutions (banks, and possibly other firms). It is conceivable that the central bank continues to operate like other banks, issuing its own deposits that could be used as money in the same way as other bank deposits are. However, in that case the central bank has no monopoly in the issue of Money (Yaqub et al., 2013). In a cashless society the unit of account (e.g. Dollar, euro) remains a national affair and is provided by the state. The followings among others enhance the functioning of cashless economy; e-finance, e-banking, e-money, e-brokering, e-exchanges etc.

In a modern economy, the use of noncash payment methods such as cards (credit and debit) dominates the use of cash in payments. The card based payment system has several players. On the one hand, are the providers of the card based payment system- first of which is the card companies like MasterCard and Visa who provide their payment network for the system to function. The second sets of providers are the banks that act as acquirers for merchants and issuers for cardholders and reach the card payment services to the ultimate users. On the other side of the system are the users- both merchants and cardholders. The benefits these two players derive from the system are manifold- the convenience of electronic transactions, the ease of credit availability, increased sales, increased purchasing power, to list a few (Yaqub et al., 2013). Since they are the end users of the convenience the card payment system generates, they are the ones who bear the cost of the system. Apart from these four players there is the regulator of the payment system, usually the central bank of the country. The card based payment system cannot function in absence of any of its players. The global volume of non-cash transactions totaled 260 billion in 2009 (Yaqub et al., 2013 citing World Payments Report, 2011), after sustained average annual gains of 6.8% since 2001. The outright volume of these payments only remains heavily concentrated in developed markets. Developing countries are just improving their payments infrastructures, enabling wider adoption and greater usage of non-cash means and channels.

Yaqub et al. (2013) noted that in the new cash policy, the Central Bank of Nigeria (CBN) recently pegged daily cash withdrawals and lodgments by individual to NGN150,000.00 and corporate bodies NGN1m respectively with effect from the 1st of June 2012. Other key reasons for introducing the cash policy include:

- To drive development and modernization of our 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 for economic growth.
- To reduce the cost of banking services (including cost of credit) and drive financial inclusion by providing more efficient transaction options and greater reach.
- To improve the effectiveness of monetary policy in managing inflation and driving economic growth.

In addition, the cash 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: There is a high cost of cash along the value chain - from the CBN & the banks, to corporations and traders; everyone bears the high costs associated with volume cash handling.
- High risk of using cash: Cash encourages robberies and other cash-related crimes. It also can lead to financial loss in the case of fire and flooding incidents.

- High subsidy: CBN analysis showed that only 10percent of daily banking transactions are above NGN150,000.00 but the 10percent account for majority of the high value transactions. This suggests that the entire banking population subsidizes the costs that the tiny minority 10 percent incur in terms of high cash usage.
- Informal Economy: High cash usage results in a lot of money outside the formal economy, thus limiting the effectiveness of monetary policy in managing inflation and encouraging economic growth.
- Inefficiency & Corruption: High cash usage enables corruption, leakages and money laundering, amongst other cash-related fraudulent activities.

Theoretical framework

Merton and Bodie (1995) developed the modern theory of financial intermediation which comprises traditional theory and the changes in financial environment. The modern theory of financial intermediation emphasizes six core functions of financial intermediaries to include: provision of means for clearing and settling payments to facilitate exchange of goods and services; provision of mechanism for polling resources; resources allocation; risk management; provision of price information to help in coordinating decentralized decision making in various sectors of the economy and provision of means to tackle the problem of moral hazard, physical hazard and information asymmetry. For the purpose of this study, the enumerated functions by Merton and Bodie (1995) could be expressed as resources accumulation, resource allocation, managing various risks and facilitation of exchange. It is by realizing these functions that banking sector financial intermediation contributes to economic growth.

The growth theory states that well developed financial intermediation can promote economic growth through marginal productivity of capital, efficiency of channeling savings to investment, savings rate and technological innovations. Buttressing further, Levine (1997) confirmed that financial development promotes economic growth through channels of marginal productivity of capital, efficiency of channeling savings to investment, saving rate and technological innovation. Affecting economic growth through these channels is realized by functions of financial intermediaries. These functions include the provision of means for clearing and settling payments to facilitate the exchange of goods, services and assets, the provision of a mechanism for pooling resources together and channeling them to the most productive sector of the economy for investment, risk management, and price information to help coordinate decentralized decision making in various sectors of the economy, among others (Merton and Bodie, 1995). Among financial intermediaries, the banking firms play important role, they mobilise funds in terms of deposit and transfer them to deficit economic units for financing real investment.

Theoretical studies and empirical evidence have shown that countries with better-developed financial systems enjoy faster and more stable long-run growth. Well-developed financial markets have a significant positive impact on productivity, which translates into higher long-run growth. Merton (1995) citing Solow (1956) noted that in the absence of a financial system that can provide the means for transforming technical innovation into broad implementation, technological progress will not have significant and substantial impact on the economic development and growth. Theoretical conceptions explain that financial systems influence savings and investment decisions and hence long-run growth rates through the following functions (i) lowering the costs of researching potential investments, (ii) exerting corporate governance, (iii) trading, diversification, and management of risk, (iv) mobilization and pooling of savings, (v) conducting exchanges of goods and services, and (vi) mitigating the negative consequences that random shocks can have on capital investment (Levine, 2004). Financial intermediaries support development through the improvement of these functions (i.e., the amelioration of market frictions such as the costs of acquiring information, making transactions, and enforcing contracts and allowing economies to more efficiently allocate resources (savings) across investments). However, the positive effects of financial development are tailored by the macro policies, laws, regulations, financial infrastructures and enforcement norms applied across countries and time.

This study examines the significant differences in financial intermediation indices (demand deposit, credit to the private sector, and currency outside the banks) in Nigeria under the cashless policy.

Empirical Review

Various studies on cashless policy and electronic payments and banking have been carried out since the inception of the policy in 2012. Muhammad (2012) in an article titled analysis of value creation of electronic banking in Nigeria examined trends of banking habit in Nigeria across banking regimes of regulation and deregulation hinged on historical perspective of banking development in Nigeria, from independence to 2012. Relevant secondary data covering 1960 to 2010 were collected from Central Bank of Nigeria annual reports and analysed using the descriptive trend analysis. Muhammad (2012)finding suggests a static behavior across the monetary policy regimes and thus cautioned rushing the cashless program until measures are in place to encourage and push fast the banking culture change for the success of

the cashless Nigeria program. Nwankwo and Eze (2013) ascertained the extent to which electronic payment affect cashless economy of Nigeria using a descriptive researched sign. Nwankwo and Eze (2013) indicates that the electronic system of payment has a great implication in cashless economy of Nigerian but that it will lead to significant decrease in deposit mobilization and credit extension by Nigerian deposit money banks. They concluded that cashless system of payment need to be examined and the e-payment system developed system, so that people will be used to it before talking of cashless economy. This is because; bulk of the Nigerian economy is driven by SME and petty traders. To retain this policy of cashless economy in Nigeria, the authors recommended that the migration of our payments system towards a cashless society would require some reforms and a lot of effort and sensitization especially for low income group, who are currently deeply rooted in using cash and see it as a convenient and easy way of receiving and making payments. Jatau and Dung (2014) in their paper titled the Central Bank of Nigeria's cashless policy: a major panacea for eliminating corruption and enhancing sustainable development in Nigeria aimed at unveiling how electronic payment which is the constituent of the cashless policy can be instrumental in eliminating corruption in Plateau State and Nigeria at large, hence, enhancing sustainable development. They noted that the cashless policy involves adopting of electronic processes to documenting all payments (e-payment) thereby providing an effective data base for optimal revenue generation. This encourages transparency and accountability; thus, making fund available for developmental projects they concluded.

Yaqub et al., (2013) in their paper titled the cashless policy in Nigeria: prospects and challenges pointed out the prospects and challenges of such policy, in a developing economy like Nigeria. In concluding their exploratory study, Yaqub et al., (2013) posits that the move towards a cashless Nigeria brings with it numerous benefits but there is still the need to create more awareness to entice the numerous unbanked Nigerians into the banking system. Soyemi et al. (2015) also shows that even though Nigeria has adopted the cashless culture, the present state of implementation is still very poor and the phenomenon faces several challenges including the resistance of most Nigerian towards moving totally to a cashless economy as a result of traditional attachment to cash, the fear of security breach expected in a cashless society and the prevailing infrastructural deficit that has characterized the Nigerian society. Ovat(2012) x-rayed the associated benefits of the policy as well as the attendant challenges that may encumber the successful achievement of the policy's objectives. The exploratory study identified key areas to make the policy succeed to include: periodic review of the policy by the CBN to iron out grey areas; embarking on intensive awareness campaign and sensitization of the citizenry by the CBN; putting adequate security mechanisms inplace to forestall fraudulent practices; making the public power supply work efficiently; and exempting cash lodgments and public holidays from cash management charges. Okoye and Ezejiofor (2013) examined the significant benefits and essential elements of cashless policy, and the extent to which it can enhance the growth of financial stability in the country. The descriptive research design was adoptedfor the study with a sample size of 68 questionnaires arrived at using the convenience sampling technique. The data collected was subjected to face validity test, and was tested with ANOVA and chi – square (x2) technique and theresults indicate that: majority of Nigerians are already aware of the policy and majority agree that the policy willhelp fight against corruption/money laundering and reduce the risk of carrying cash. Major problems envisagedto hamper the implementation of the policy are cyber fraud and illiteracy. Based on the findings Okoye and Ezejiofor (2013) recommended that government should adopt a different strategy to educate the non-literate Nigerians about the cashless economy; and a framework should be worked out to provide cyber security in Nigeria.Ajayi (2014)examined the effect of cashless monetary policy on Nigerian banking industry using a sample 370 Guaranty Trust Bank (GTBank) staffin Ekiti State, Nigeriaselected based on Taro Yemane's formula for sample size. The data collected was analyzed using frequency table and percentages while the non-parametric statistical test, Chi-square was used to test the formulated hypothesis. The results of the study showed that there are significant reasons and benefits inherent in the implementation of cashless policyas it facilitates ease of operations and reduces queue and congestion in the banking hall, among others. Olanipekun, Brimah andAkanni (2013) examined the benefit and advantages of the cashless policy and identified (increased convenience, reduce cash handling cost, reduce risk of using cash) as benefits and advantages, while noting challenges hindering the successful achievement of the policy's objectives to include amongst others (inadequate infrastructure, high rate of illiteracy, lack of unique national identity).

Alagh and Ene (2014) examined the impact of cashless banking on the profitability of banks in Nigeria. The study usedproxies for cashless banking such as Automated teller machine (ATM), Point of sale (POS),and web based transaction (WBT) to examine its impact on the aggregate return on equity(ROE) of deposit money banks in Nigeria, through an ordinary least square (OLS) multipleregression method of analysis. The result showed that ATM and POS are positively related toROE, while WBT related negatively to ROE. This is as a result of high rates of bank chargeson online deposits and as a result, most customers do not patronize the product. Non-usage ofthe WBT for online deposits had created a negative impact on profitability of Nigerian banks.Alagh and Ene (2014) recommends among others that banks should provide sufficient standby generators that could be used in case of electricity failure, provide adequate

ICTinfrastructure and management framework, and enlighten the public on the importance ofusing ICT banking products.Osazevbaru, Sakpaide, and Ibubune (2014)examined the impact of cashless policy on the profitability of Nigerian banks against the backdrop that these banks in a cash based economyare known for their huge profits even in the face of associated high cost of operations. To achieve the objective of the study secondary data were collected and analyzed using content analysis comparing profits under cashbased policy with a cashless regime. The results revealed that cashless economic policy positivelyimpact on banks' profit through reduction in cost of operations and banking the unbankedpopulace (Osazevbaru, Sakpaide and Ibubune, 2014) concluded.

Ejoh, Adebisi and Okpa (2014)examined the cash-less economic system so as to assess the relationship between Information and Communication Technology (ICT) and the implementation of cash-less policy. In order to achieve the primary objective of the study, the study used structured questionnaire as a means of data collection from 120 respondents randomly selected. The data was analyzed using simple percentage procedure, and the collated data tested using chi-square technique. Their study revealed that there exist a significant relationship between ICT and cash-less policy implementation in the Nigerian financial environment. Based on the findings it was recommended that the federal government of Nigeria should collaborate with all the states ICT centers and other private institutions to provide mass ICT education for the computer illiterates and banks should invest more in e-banking technology in order to enhance public awareness which would in turn encourage cash-less economy in Nigeria.

The review of empirical literature suggests that past studies were mainly exploratory and focused more on the benefits as well as challenges facing the implementation of cashless policy in Nigeria. Empirical studies x-rayed above notes the benefit and advantages of the cashless policy to include (increased convenience, reduce cash handling cost, reduce risk of using cash), while noting challenges hindering the successful achievement of the policy's objectives to include amongst others (inadequate infrastructure, high rate of illiteracy, lack of unique national identity). Consequently, studies in the past failed to empirically show how, and the extent to which the adoption of cashless policy in Nigeria with its enhanced payment system has influenced the level of financial intermediation. Specifically, past studies failed to show empirically whether there is a significant difference in financial intermediation following the adoption of the cashless policy in Nigeria. This is the gap in literature which this study fills. This study thus examines the significant differences in financial intermediation factors (demand deposit, credit to the private sector, and currency outside the banks) in Nigeria under the cashless policy. This study is of significance to scholars as it contributes to the current cashless policy-financial intermediation literature. It is also of importance to the public as it showcases the level of financial intermediation in Nigeria before and after the adoption of the cashless policy.

Research Method

Research Design, Nature and Sources of Data

In line with the general approach adopted in empirical studies, this study made use of existing monthly data handpicked from the Central Bank of Nigeria (CBN) money and credit statistics as published in the CBN website. Thus the nature of data used is secondary and sourced from the CBN official website where monthly money and credit statistics are published. To avoid encountering too many gaps in data input and given the length of time after the adoption of the cashless policy in Nigeria, the time frame for the study was truncated to a six (6) year period i.e. 2009 to 2014 divided into two periods (before and after the adoption of the cashless policy).That is three years (2009, 2010 and 2011) before the adoption of the cashless policy and three years (2012, 2013 and 2014) after the adoption of the cashless policy for a balance t-test analysis.

This study employed the Ex Post Facto research design to compare two periods i.e. before and after the adoption of the cashless policy. The model for the study is structured in a way to enhance comparisons of the pre and post periods, and to bring out whether any significant difference exist between the pre and post operational variables of financial intermediation given the adoption of the cashless policy. This is in line with past empirical studies that have considered two samples before and after the implementation of a policy specifically the bank consolidation exercise (seeAdegbagu&Olokoye, 2008; Ani, Ugwunta and Imo, 2012; and Ugwunta, Ani and ugwunayi, 2012).

Data Analysis Technique and Model Specifications

The study thus hypothesized that the adoption of the cashless policy in Nigeria in 2012 has not led to any significant difference in the level of financial intermediation. We therefore have growth rates in money and credit statistics (demand deposit, money outside banks and credit to the private sector) as the proxies to measure the level of financial intermediation by the Nigerian banking industry before and after the introduction of the cashless policy. Growth rates in money and credit statistics (demand deposit, money outside banks and credit to the private sector) were calculated individually thus:

$$GROWTHRATE = \frac{Year_2 - Year_1}{Year_1} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where; $Year_{2,1}$ takes the value of the indicators of financial intermediation (demand deposit, money outside banks and credit to the private sector) individually. In an attempt to test whether the adoption of the cashless policy has not led to any significant difference in the level of financial intermediation, this study first of all used descriptive (narrative) statistics to specifically analyse and evaluate growth rates in demand deposit, money outside banks and credit to the private sector for the six (3) year period each of the pre and post-financial intermediation.

In testing our hypothesis, the study employed the parametric statistical pooled variance/ paired sample t-test model. This statistical tool focuses on the significant difference of chosen operational variable between two sample means observed at two points in time. In this version, the two samples are combined (pooled) to get a pooled variance and base the standard error of the difference in means on that single estimate; the resulting t can be compared directly to critical values from the *t* distribution table. The choice of this technique is that it suits the analysis since a significance test of two sampled means (before and after the adoption of the cashless policy) is being compared. It is also based on the conditions for using the t-test that:

- The population from which the sample is drawn is (approximately) normally distributed.
- The two population variances are identical, whatever value they happen to have in other words, there is homogeneity of variances.
- The sample size is small (that is $n < 30$).
- The population standard deviation (S) is unknown.

The decision is informed by comparing the paired p-value (significance level) with the 0.05 level of significance. The decision rule is toaccept Ho, if calculated p-value > 0.05 and otherwise to reject Ho, if calculated p-value < 0.05.

The t-test statistics process is specified thus;

$$t\, n_1 + n_2 - 2 = \frac{\overline{X_1} - \overline{X_2}}{S\,(X_1 - X_2)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where;

$\overline{X_1}$ = Sample mean value of the specified variable in the pre-consolidation period.

$\overline{X_2}$ = Sample mean value of the specified variable in the post-consolidation period.

$S\,(X_1 - X_2)$ = the standard deviation of the difference in the pooled variance and thus calculated as:

$$S\,(X_1 - X_2) = \sqrt{S^2P} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

$$= \sqrt{S^2_{X1} - S^2_{X2}}$$

$$= \sqrt{\frac{(n_1 - 1)\, S^2 + (n_2 - 2)\, S^2}{n1 + n2 - 2}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Where;

$S\,(X_1 - X_2)$ = Population standard deviation.

S^2_{X1} = Sample variance value of variable in the pre-consolidation period.

S^2_{X2} = Sample variance value of variable in the post-consolidation period.

$$S^2P = \text{Pooled variance of the two samples} = \frac{(n_1 - 1)\, S^2 + (n_2 - 2)\, S^2}{n_1 + n_2 - 2} \quad \ldots\ldots\ldots\ldots (5)$$

n_1 = Sample size of the pre-consolidation period.

n_2 = Sample size of the post-consolidation period.

$n_1 + n_2 - 2$ = Degree of freedom.

However, in the actual analysis, the Statistical Package for Social Sciences (SPSS) was used at a 95% confidence interval for the difference in means and at four and/or three degrees of freedom (df).

Findings

Presentation of Growth Rates in Money and Credit Statistics

The study started the presentation in this section by discussing the growth rates in money and credit statistics (currency outside banks, demand deposits, and credit to private sector) under the cashless policy regime. This is to enable an analysis of the performances of financial intermediation money and credit statistics (currency outside banks, demand deposits, and credit to private sector) under the cashless policy.

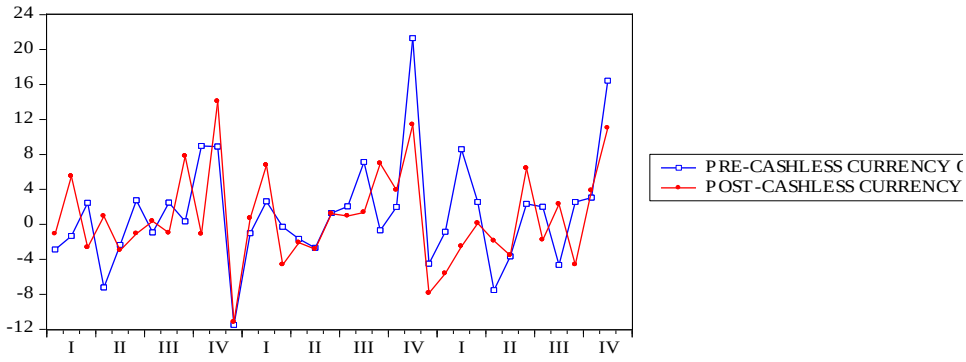

Fig. 1. Pre and Post Currency outside Banks

The growth rate statistics for currency outside banks indicates that in 2009 the growth rate in the 1st quarter stood at 2.44% but increased in the 2nd quarter to 2.73% indicating an increase of .09% in currency outside the banking system. In the third quarter of 2009, the currency outside the banking system decreased to 0.33% but declining to -11.50% at the 4th quarter and closing the period on a decline note. The decline recorded at the close of the 4th quarter of 2009 continued into the 1st quarter of 2010 when the currency outside banks decreased to -0.27% but increased to 1.29% in the 2nd quarter of 2010. However, in the 3rd and 4th quarter of 2010, the growth rate in currency outside banks declined to -0.67% and -4.51% respectively and closing the year 2010 on a declining rate. The declining rate in currency outside the banking system in the last quarter of 2010 could not be maintained in 2011 as currency outside banks increased and stood at 2.55%, 2.34%, 2.55% and 16.43% in the 1st, 2nd, 3rd and 4th quarters of 2011 and closing the period for this study on an increasing growth rates. However, when compared to the post-cashless policy (2012-2014), the growth rate statistics for currency outside banks indicates that in 2012 the quarterly growth rate in the 1st quarter stood at -2.65% but increased in negativity in the 2nd quarter to -1.05% indicating an increase in currency outside the banking system. In the third quarter of 2012, the currency outside the banking system continued on an increasing note to 7.79% but declining to -11.17% at the 4th quarter and closing the period on a decline note. However, in the 1st , 2nd and 3rd quarters of 2013 the currency outside banks increased to -4.61%, 1.22%, 6.96% respectively while closing the 4th quarter of 2013 on a declining rate of -7.86%. The declining rate in currency outside the banking system in the last quarter of 2013 could not be maintained in 2014 as currency outside banks increased to 0.12% in the 1st quarter of 2014. In the 2nd quarter of 2014, currency outside banks increased to 6.14% but dropping to -4.63% in the 3rd quarter of 2014 and closing the period for this study on a decreasing note.

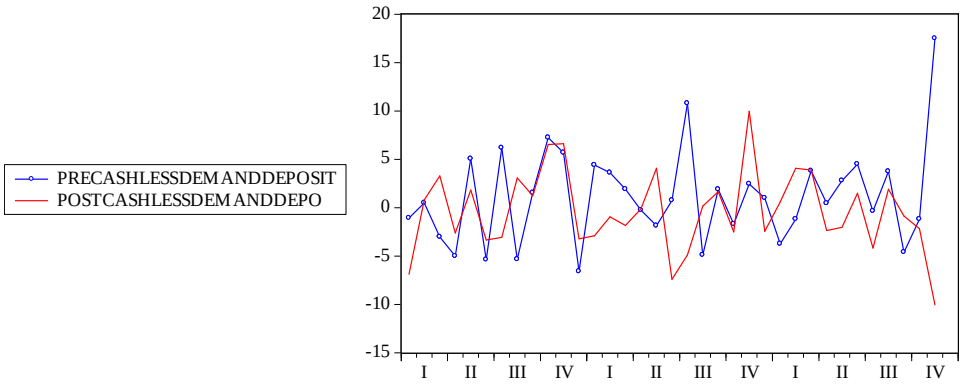

Fig. 2. Pre and Post Demand Deposits
Source; Appendix 2

It is the expectation of this study that a decline in currency outside the banks will bring about an increase in demand deposit. The demand deposit decreased in rates in the 1st quarter of 2009 to -3.02% and declined to -5.01% in the 2nd quarter but increased to 1.55% in the 3rd quarter of 2009. However, the increase in the growth rates of demand deposit in the 3rd quarter of 2009 could not be maintained into the last quarter of 2009 as the rates dropped to -6.58%. In the 1st quarter of 2010, the growth rate in demand deposit increased to 1.91% but declined to 0.72% in the 2nd quarter. In the 3rd quarter, the growth rate in demand deposit increased to 1.89% while closing the 4th quarter at 0.99%. In the 1st quarter of 2011, the demand deposit increased to 3.79% and to 4.48% in the 2nd quarter but decreased to stand at -4.60% in the 3rd quarter of 2011 while closing the pre-cashless policy period on an increasing note. In the post-cashless policy period, the demand deposit increased in rates in the 1st quarter of 2012 to 3.27% but declined to -3.34% in the 2nd quarter. In the 3rd quarter of 2012, the growth rate in demand deposit rose to 1.24% but closing the year on a decline note of -3.21% in the last quarter of 2012. In the 1st quarter of 2013, the growth rate in demand deposit increased to -1.84% although on a declining rate. In the 2nd quarter of 2013, the growth rate in demand deposit dropped to -7.41% still on a negative note but increased to 1.66% in the 3rd quarter of 2013. The demand deposit growth rate however dropped to -2.45% in the 4th quarter to close year 2013 on a decline note. In the 1st quarter of 2014, the demand deposit increased to 3.88% but decreased by 2.4% to stand at 1.48% in the 2nd quarter of 2014. The decline in demand deposit recorded from the 1st quarter of 2014 continued into the 3rd and 4th quarters as the rates stood at -0.86% and -10% respectively.

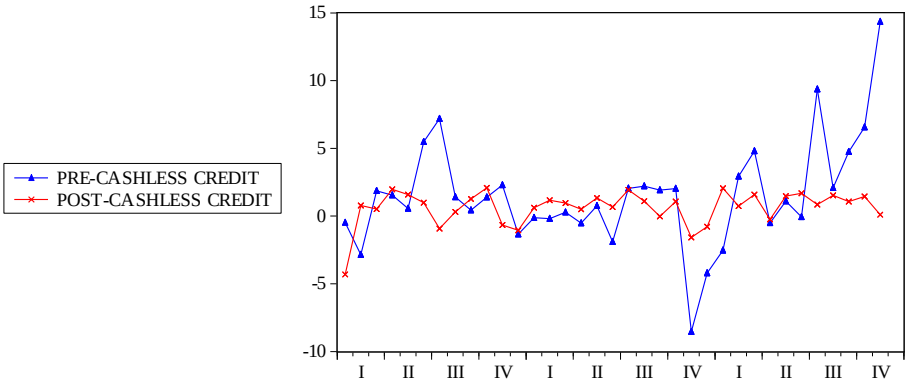

Fig. 3. Pre and Post Credit to the Private Sector

Availability of demand deposits enhances the capabilities of the banks in granting credits to the private sector of the economy. The growth rates in the banks' credit to the private sector stood at 1.86% in the 1st quarter of 2009 and increased to 5.48% in the 2nd quarter of 2009. However, in the 3rd quarter, the growth rates in the banks' credit to the private sector dropped to 0.43% and to -1.34% in the 4th quarter of 2009. The growth rate in credit to the private sector increased to 0.28% in the 1st quarter of 2010 but dropped to -1.9% in the 2nd quarter. The growth rates in the banks' credit to the private sector increased to 1.91% in the 3rd quarter while dropping to -4.20% in the 4th quarter of 2010. The increase in credit to the private sector continued in the 1st quarter of 2011 at 4.79% but declined to -0.06% but increased to 4.74% and 14.35% in the 3rd and 4th quarters of 2011. The growth rates in the banks' credit to the private sector in the

post-cashless policy period stood at 0.51% in the 1st quarter of 2012 and increased to 0.98% to 1.26% in the 2nd and 3rd quarters respectively. However, in the 4th quarter of 2012, the growth rate in credit to the private sector dropped to -1.04% but increased to 0.61% in the 1st quarter of 2013. The increase in credit to the private sector continued in the 2nd quarter of 2013 at 0.66% but declined to -0.01% and to 0.78% in the 3rd and 4th quarter of 2013. In 2014, banks' credit to the private sector growth rate opened the year at 2.05% which slipped down to 1.58% in the 1st quarter of the year and increased to 1.68% in the 2nd quarter of 2014 but declined to 1.06% in the 3rd quarter although on positive growths.

The objective of this study is to ascertain if there is a significance difference in financial intermediation after the adoption of the cashless policy in Nigeria using money and credit statistics of currency outside banks, demand deposit and credit to the private sector. Thus the study hypothesized that there is no significant difference in financial intermediation (currency, deposits and credit to the private sector) by Nigerian banks before and after the adoption of the cashless policy. The decision rule is to reject the null hypothesis if the significance (2-tailed) value of the resulting *t* is < 0.05 otherwise the null hypothesis is accepted.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	currencyoutsidebankpost - currencyoutsidebankpre	-.53542	5.24495	.88656	-2.33712	1.26629	-.604	34	.550
Pair 2	demanddepositpost – demanddepositpre	-1.49025	6.84579	1.15715	-3.84186	.86136	-1.288	34	.206
Pair 3	creditprivatesectorpost– creditprivatesectorpre	-.92235	3.94964	.66761	-2.27910	.43439	-1.382	34	.176

Source: Author's SPSS Output, 2015.

Hence, the significance (2-tailed) value of the resulting *t*of .550, .206, and .176 for currency outside banks, demand deposit, and credit to the private sector respectively > .05. Thus, we accept the null hypothesis that there are no significant differences in currency outside banks, demand deposit, and credit to the private sector and thus conclude that there is no significant difference in financial intermediation by Nigerian after the adoption of the cashless policy.

Conclusion and Recommendations

An efficient payment system is imperative in the banking industry as it plays a very crucial role in any economy.In today's world, many people across the globe make payments electronically rather than cash based and this discourages cash transactions while enabling banks to create money for credit purposes. The Central Bank of Nigeria (CBN) introduced the cashless policy in April 2011 with the objective of promoting the use of electronic payment channels instead of cash.Nigerian banks are making hugeinvestments in technology to upgrade their infrastructure in order to provide new electronicinformation based services. Such services as online retail banking, Point of Sale terminals (POS) make it possible for individuals and corporate bodies to take advantage of newtechnologies at reasonable costs.An efficient and modern payment system is positively correlated with economic development, and is a key enabler for economic growth,to reduce the cost of banking services (including cost of credit) and drive financial intermediation and inclusion by providing more efficient transaction. This study examines financial intermediation in the Nigerian banking industry under the cashless policy and specifically ascertains whether significant differences exists in financial intermediation statistics (currency outside banks, demand deposits and credit to the private sector) before and after the adoption of the cashless policy in Nigeria in 2012. Findings from the study suggests that that there is no significant difference in financial intermediation by Nigerian banks after the adoption of the cashless policy.

Given the findings of this study, the following recommendations are imperative. Banks in Nigeria should strive to put in place measures that will mop up much of the currency outside the banking system. Banks should enhance and strengthen the payment system so as to encourage the use of interbank payment systems which improves on fallowing of demand deposits by customers.Banks should reduce the stringent measures that discourages the private sector from accessing bank credits so as to encourage borrowings by the private sector.

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