Does Currency in Circulation Promote Economic Performance in Developing Countries? Evidence from Nigeria

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Abstract

Empirical studies on currency in circulation have been the object of great attention by economists in the developing countries due to its vital role in achieving effective electronic payment system by the monetary authorities. In this disquisition, analysis were carried out to examine whether currency in circulation (CIC) promotes economic performance, using Vector Autoregression Model (VARM) and VAR Granger Causality Test, annual data of all variables for the period 1960–2011 were employed. According to the results, the coefficient of currency in circulation when lagged by one period is positive but statistically insignificant at 5% contrary to expectations. The statistically insignificant relationship that exists between the monetary instruments such as; exchange rate, inflation rate, normal interest rate, high power money, currency in circulation, demand deposit and normal GDP sheds more light on how ineffective monetary policies adopted by the Central Bank of Nigeria (CBN) for promoting economic growth. This findings brings to the fore that the cashless economy been proposed by the CBN will have a significant impact on the performance of Nigeria economy. The government should provide adequate infrastructure and all enabling legal framework that will help the informal sector of the economy to embrace the cashless payment system, so as not to erode the diminutive contribution of the informal sector to GDP in Nigeria. The study also revealed that demand deposit granger causes economic growth so CBN should increase the deposit rate which will serve as incentive and enforce the existing financial regulations that will protect depositors.

Keywords: currency in circulation, modern QTM, vector autoregression model (VARM)

1. Introduction

Nigeria can be regarded as a cash-based economy because majority of retail and commercial payments are made in cash. A recent survey by Central Bank of Nigeria shows that cash-related transactions accounted for 99 percent of customer activity in Nigerian banks today. Thus, the need to examine the impact of Currency in circulation (which will henceforth be referred to as CIC) on economic performance is essential. CIC denotes the amount of notes and coins held by economic agent outside banking sector and are the most liquid monetary aggregate. CIC and demand deposits are components of narrow money, any movement in these variables are of interest to monetary economists. CIC dynamics are frequently seen as measure for monetization or demonetization of the economy. Two major indicators showing the importance of CIC in every economy are share of CIC in money supply and ratio of CIC to GDP (Stavreski, 1998). CIC (notes and coins) is universally accepted as money so they are part of the money stock. Demand deposits (dd) are also universally accepted to fit all the requirements of being called money. Hence, they also form part of the stock of money in the economy. Problems arise with respect to liquid monetary assets which fulfill the store-of-value function but not the medium- of-exchange function (e.g., time deposits) and also things that serve the medium-of-exchange function but not the store-of-value function (e.g., credit cards).

In developing countries where narrow definition of money is adopted, the presumption is that only CIC and demand deposits of commercial banks perform the function of money. The narrow definition of money puts money as CIC plus demand deposits of commercial banks, the proportion in which these two elements contribute to money stock will depend upon the extent to which the financial system is developed and bank related financial instruments, especially cheques, credit/debit cards etc, are acceptable for payment of goods and services. Where the society's financial system is well developed and there is widespread acceptance of electronic payment system,

demand deposit component of the money supply will be very high and the use of currency will be limited. A very good example is Sweden, in most Swedish cities, public buses don't accept cash and tickets are prepaid or purchased with a cell phone text message. A small, but growing number of businesses only take cards and some bank offices which make money on electronic transactions have stopped handling cash altogether. Bills and coins now just 3% of Sweden's economy (Simon Tomlinson, 2012).Such economy will be said to be tending towards a cashless society where, at the extreme, currency in circulation is dispensed with and the narrow definition of money will be demand deposit alone. On the other hand where people do not have faith in the electronic payment system, demand for cash will be higher as most transactions will be on cash basis, 99% of Nigeria transactions were cash based.

In theory, the main purpose of currency in circulation is to provide for cash transactions within the economy. Its development should therefore reflect both economic activity and changes in the price level. The broadest indicator of economic activity is gross domestic product. In current prices, this indicator includes information on price developments as well. In terms of pace of growth, there is no first glance of clear relationship between currency in circulation and economic performance.

As a result, increasing consideration is now being dedicated to the important of electronic payment system to economic performance. It has been applauded that improving the electronic payment system by reducing the amount of CIC will ensure rapid growth in the economy. Even though, there have been a lot of empirical studies on the relationship between money supply/demand and economic performance in Nigeria, not too many studies focus on the economic growth impact of CIC. Obviously, this is the motivation behind this disquisition. This study is important because it broaden our understanding of monetary policy issues and also serves as a guide for policy makers in the developing countries.

The main objective of this study is to provide numerical evidence on the link between CIC and Nigeria's economic performance. Specifically, it sheds light on the role of CIC on economic growth and payment system in Nigeria. After this introduction, the rest of the paper is planned as follows: In section two, the study provides a review of relevant literature. Section three discusses the analytical framework and the empirical methodology while section four covers the empirical results. The policy implications and conclusions were provided in section five.

2. Review of Literature

Studies from both developed and developing economy shows that CIC depends on so several factors among which interest rate stands out prominently. Cabrero et al., (2002) said the amount of banknotes in circulation when it comes to liquidity management of the Euro system also confirmed how important interest rate is in determining the value CIC. Nenovsky and Hristov (2000) also hypothesized the development of real sector (growth in GDP) as a major determinant of CIC. Nominal increase in peoples' income is expected to bring about increase in CIC. The research discovered that one of the reasons of demand for money by economic agents' is their willingness to save or hoard cash. They identify two types of hoarding, one that has to do with the official economy and the second was linked with the underground economy. Under the official economy, the populace decides to voluntarily hold a percentage of their cash when income on substitute assets is lesser than transactions costs on portfolio transformation. Nenovsky and Hristov (2000) and Stavreski (1998) also reach agreement that cash are held for the purpose of servicing economic transactions in underground economy. Cash is the best form of payment when economic agents want to hide part of their economic activities so as to reduce tax base, moreover cash payment provides highest level of anonymity, which makes it the most attractive form of financing unlawful activities.

The underdeveloped nature of the banking system and the inadequate development of the electronic payment tools such as credit cards, debit cards and ATM cards have also been mentioned as one of the reasons some countries are still cash base, (Cassino et al., 1997; Stavreski, 1998). Automated means of payment like smart cards are stored value cards, which record an amount of credit and the amount spent using up that credit. These are made to substitute minor cash transactions, and therefore, are expected to decrease CIC. It is however, anticipated that within the next few years the growing trend of CIC in various developing economy will stabilize, and ultimately drop as smart cards become extensively used. On the use of ATMs, however, the representation is quite uncertain. One would tempt to think that extensive use of ATMs will result into a decrease in demand for currency, because it makes moving with cash becomes unnecessary. Though, the other school of thought maintains that invention of ATMs have made cash more available in the economy, to the extent that transactions that were previously done via cheque (because cash was not readily available e.g., on weekends) can now be done through cash. Also, the cost of carrying out many bank transactions, i.e., the bank transaction charges may

create an incentive for customers to make small payment by cash to avoid these charges, and probably have also encouraged customers to make fewer but larger cash withdrawals (Cassino et al., 1997). Both these tendencies would increase the amount of currency in circulation. Hence it is not clear in literature whether the total demand for cash will increase or reduce with modern technological innovations.

As it is widely recognized in literature, CIC is a very important element in the conduct of monetary policy. This fact may be of particular relevance to the case of Nigeria where fiscal policy may not be readily manipulated by policy makers. For example government expenditures are closely linked to oil revenues and the related large government spending commitments which usually leave little room for maneuvers (Ahmed, 2013).

Monetary authorities in Nigeria and even experts at the World Bank and International Monetary Fund (IMF) jointly and severally agree that the basic macroeconomic problems of Nigeria are associated with high level of CIC and unrealistic exchange rate of the naira. When naira is over-valued, export is discouraged as it becomes more expensive and on the other hand, import is encouraged by cheapening it. Over-valued naira tends to be a source of undermining effective resource utilization. It encourages capital fight and also leads to cheapening import thereby resulting in Nigeria being import dependent. The implication has been high unemployment, inflation, declining productivity and instability of exchange rate. It is therefore difficult to predict foreign exchange market as demand plan is unstable (Edwards, 2005).

2.1 The Nigeria Experience

The year-on-year growth of CIC in Nigeria has been characterized by relatively high volatility. The development of CIC was also influenced by the transformation process in the economy, the transformation from military rule to democratic regime. Moreover, cash circulation was affected by several one-off factors, including in particular the banking crises of early 1990s to 2004, as well as the refunding of protected deposits held with failed banks between 2004 and 2006. During this period the depositor's confidence in the banking sector was eroded and CIC continues to grow while demand deposit is on decline. During the democratic era (2000–2010), demand deposit was on the increase although CIC was increasing as well, but not as much as the growth observed in demand deposit which indicates the level of confident that was restored in the banking sector as a result of the commercial bank's recapitalization to a minimum of =N= 25 billion and the introduction of democratic governance. Growth in gross domestic product (GDP) which was the measure of economic performance was more than double during this period compared to the growth during the banking crisis era (1990–1999) see Table 1. The growth in gross domestic product (GGDP), currency in circulation (GCIC), demand deposit (GDD) were =N= 776,331.21, =N= 1,163,403.94 and =N= 4,279,867.95 (all in millions) respectively during the period 2000 to 2010 indicating improvement in the Nigerian economy and financial sector contribution to GDP. The growth in demand deposit was higher than growth in CIC which shows the level of development in the electronic payment system.

Table 1. Decade analysis of growth in GDP, currency in circulation and demand deposit

YEAR	GGDP	GCIC	GDD	Remark
1960 - 1969	3,224.50	272.234	191.284	Independent Era
1970 - 1979	29,946.99	2,702.40	3,999.70	Oil Boom Era
1980 - 1989	236,728.58	10,721.40	16,507.20	
1990 - 1999	312,182.48	208,560.09	206,621.81	Banking Crises Era
2000 - 2010	776,331.21	1,163,403.94	4,279,867.95	Democracy Era

Source: Author's Computation (All figures in Millions of Naira).

Key: GGDP: Growth in Gross Domestic Product, GCIC: Growth in Currency in Circulation, GDD: Growth in Demand Deposit.

There is no single clear-cut explanation of the recent increase in CIC, but several factors that may have contributed are worth noting. For one thing, economizing on the use of cash may have possibly changed within present institutional patterns. If so, any given increase in economic activity now or in the near future may require a somewhat larger rise of CIC than formerly. A second factor is undoubtedly the increased amount of vault cash currently being held by banks. This increase may, in turn, have several causes: a rising demand for currency on the part of the general public and hence a need for the banks to maintain larger working balances, an attempt by the banks to lay in additional supplies of coin in the face of the current coin shortage and possibly continuing

adjustment to the change in the minimum reserve requirement which permitted banks to count vault cash as part of their legal reserves. But the increases in vault cash and coin are only part of the story, for the expansion in the public's demand bills also appears to have exceeded the rise that might be attributed to increased transaction needs. Two explanations for this new demand have been suggested. The marked increase in the relative number of youths between the age bracket 15–19 years, many of whom income are earn in cash which never find their way into the banking system because majority of them work in the informal sectors of the economy, and spend quite a bit of money but few of whom have checking accounts. Secondly, the proportion of youngsters in the 15–19 age groups in the total population raised from 17.40 per cent in 1998 to 20.57 per cent in 2010.

Another explanation to the continuous increase in CIC is the introduction of democracy. Nigeria democracy has been described as one of the most expensive in the whole world. Since the installation of democratic government in year 1999, CIC has doubled. Growth in CIC was just =N27,552.70 million in the year 1998 which was the highest since 1960, during the year 2000 CIC has grown by =N101,935.19 million from just a little bit above =N36,000.00 million in the previous year. The data also shows that during the election years Nigeria recorded the highest growth in currency in circulation except for the year 2003 which had a marginal growth of =N39,101.50 million. This was accounted for by the power of incumbency used by President Olusegun Obasenjo because the transition was done within the ruling party, People's Democratic Party (PDP) so the need to spend a lot of money on campaign for election did not arise. In the year 2007 the growth in CIC was =N181,520.27 million which dropped to =N 24,674.77 million in 2008. The highest growth in CIC was during the general election year 2011 which was =N256,286.56 million this is more than seven times currency in circulation in the year 1999.

Corruption has also played a key role to the continuous increase in CIC. The cost of governance has been very high due to corrupt politicians/government officials in various sectors of the economy; payment of bribe has become the order of the day. Bribes are been paid in cash which never find their way into the banking sector. Politicians have turned their houses into banks, in fact the stock of money in their various home is more than the amount of cash held in the vault of some commercial banks.
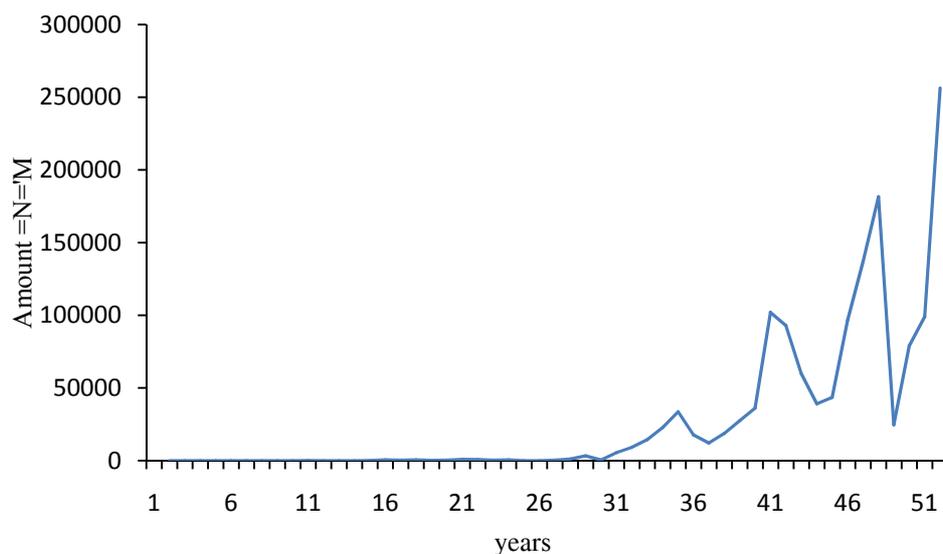
Figure 1. Graph Showing Growth in Currency in Circulation (1960 to 2011)

Source: Author's Computation (All figures in Millions of Naira)

3. The Model, Data and Estimation Techniques

The most important and critical requirement for the research is the provision of an accurate and consistent data along with an appropriate methodology. Therefore, the use of systematic and most suitable technique in conducting any empirical study was imperative. Basic hypotheses, data selection, model specification, variables

description and procedures were considered in the basic elements of methodology. All these key-components of methodology are discussed in this section.

3.1 The Model

High level of CIC in Nigeria has been attributed to inefficiency of central bank of Nigeria monetary policy, the underdeveloped nature of the Nigeria banking system and failure of the economy to develop the informal sector. The model estimated in this study follows modern quantity theory of money (QTM) (Milton Friedman, 1960) that includes the traditional variables such as the real interest rates, money stock, velocity of money, Gross National Product (GNP), Money Supply, inflation etc. Drawing from the works of Emerson (2006) and Akhtaruzzaman (2008), the quantity theory of money identity is written as:

$$P_t + y_t \equiv m_t + v_t \tag{1}$$

Where P_t is the price level, y_t is real output, m_t is money stock, and v_t is the velocity of money. From the exchange equation (i) above, we would notice that $p_t + y_t$ equals total expenditure and equals the Gross National Product (GNP) using expenditure approach to National Income estimation. The equation could therefore be re-written as follows:

$$GNP_t/GDP_t \equiv m_t + v_t \tag{2}$$

$$m_t = cic_t + dd_t + td_t + sd_t \tag{3}$$

$$m_t = cic_t \tag{4}$$

Where cic_t is the amount of CIC at a point in time, dd_t is the demand deposit, td_t is time deposit in local currency, sd_t is savings deposit. In equation (iii) all independent variables are held constant except cic_t which is the focus of this research work.

$$GDP_t = cic_t + v_t \tag{5}$$

The modern quantity theory of money does not assume that the velocity of money is constant. Hence, this research work assumes that financial and institutional structures have developed over the years and specifies the velocity of money as a function of the nominal interest rate (nir), inflation (inf), demand deposit (dd), ratio of CIC to demand deposit (ctd). The ratio of CIC to demand deposits is the measure of electronic payment system development in an economy; a low ratio indicates that the economy is tending toward a cashless society. It has been established that improvement in electronic payment system promotes economics performance Simon Newstead (2012), Mark Zardi, Virenda Singh, Justin Irving (2013).

$$V_t = \beta_0 + \beta_1 dd_t + \beta_2 nir_t + \beta_3 inf_t + \beta_4 ctd_t + \beta_5 hpm_t + \beta_6 exr_t + u_t \tag{6}$$

Where hpm is high power money, $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are coefficients and μ_t is a stochastic error term.

$$GDP_t = (\beta_0 + \beta_1 dd_t + \beta_2 nir_t + \beta_3 inf_t + \beta_4 ctd_t + \beta_5 hpm_t + \beta_6 exr_t + u_t) + (cic_t) \tag{7}$$

$$hpm_t = cic_t + res_t \tag{8}$$

where res_t is the reserve held by central bank at a point in time.

Combining (iv) and (vi), taking into consideration like terms

$$GDP_t = \beta_0 + \beta_1 dd_t + \beta_2 nir_t + \beta_3 inf_t + \beta_4 hpm_t + \beta_5 exr_t + \beta_6 ctd_t + \beta_7 cic_t + u_t \tag{9}$$

Using vector autoregression model by lagging all the variable by one year

$$GDP_t = \beta_0 + \beta_1 GDP_{t-1} + \beta_2 ddt_{-1} + \beta_3 nir_{t-1} + \beta_4 inf_{t-1} + \beta_5 hpm_{t-1} + \beta_6 exr_{t-1} + \beta_7 ctd_{t-1} + \beta_8 cic_{t-1} + u_t \tag{10}$$

with the following a priori expectations

$$\frac{\delta gdp}{\delta \beta_{t-1}} \geq 0, \frac{\delta gdp}{\delta dd_{t-1}} \geq 0, \frac{\delta gdp}{\delta hpm_{t-1}} \geq 0, \frac{\delta gdp}{\delta cic_{t-1}} \geq 0, \frac{\delta gdp}{\delta gdp_{t-1}} \geq 0, \frac{\delta gdp}{\delta ctd_{t-1}} \geq 0, \frac{\delta gdp}{\delta nir_{t-1}} \leq 0, \frac{\delta gdp}{\delta \inf_{t-1}} \leq 0, \frac{\delta gdp}{\delta exr_{t-1}} \leq 0$$

This research work delivers empirical evidence on the link between CIC and economic performance using Vector Auto regression methodology. This study is clearly different from the work of Emerson (2006) and Akhtaruzzaman (2008) because they only accounted for the relationship between financial development and velocity of money, this study relates currency in circulation and velocity of money to economic performance with the intention of knowing the impact of lagging those variables on growth of GDP in Nigeria.

This study differs from other known studies in Nigeria in a number of ways. Vector Autoregression methodology was use so as to establish the impact of CIC in the previous year on current year GDP. Unlike other known studies in Nigeria which try to measure the impact of money supply (M_1 and M_2) on economic development, this

research work uses CIC and its determinants. This study check the combine effect of CIC and velocity of money on economic performance, it also introduces a measure of effectiveness of the electronic payment system using CIC to demand deposit ratio. This study establishes the direction of causality between GDP, CIC and DD using Pairwise Granger Causality Test. Finally, as opposed to the Augmented Dickey—fuller unit root test, it uses the Elliott-Rothenberg-Stock Point-Optimal test type.

3.2 Data Set

Time series data for this study were obtained from various volume of Central Bank of Nigeria Statistical Bulletin, Annual Reports and Statement of Accounts which covered the period 1960–2011.

3.3 Estimation Techniques

Granger and Newbold (1974) have demonstrated that if time series variables are non-stationary all regression results with these time series will differ from the conventional theory of regression with stationary series. That is, regression coefficients with non-stationary variables will be spurious and misleading. Thus, the Elliott-Rothenberg-Stock unit root test was used to ascertain the characteristics of the data in order to determine whether the variables have unit roots i.e., whether it is stationary and the order of integration. To improve the power of the unit root test, Elliot, Rothenberg & Stock (ERS) proposed a local to unity detrending of the time series. ERS developed a feasible point optimal test, "P-test", which takes serial correlation of the error term into account. Afterward, the Johansen Cointegration technique is used to test for the existence of a long-run relationship among variables in the equation. Essentially, it is used to check if the independent variables can predict the dependent variable both now (short-run) or in the future (long-run). Although long-run equilibrium relationship may occur among variables in the regression model, short-run equilibrium may not occur. Granger Causality test is conducted to assess the direction of causality among the variables. The Granger causality test states that a stationary variable x is said to granger-cause a stationary variable y only if y is predicted better by using the past changes of x, together with the past changes of y itself, rather than by using only the past changes of y. A bi-variate autoregressive standard Granger causality model is study presented below:

$$GDPt = \sum_{i=1}^{n} \beta 1cic + \sum_{j=1}^{n} \alpha jGDP + \mu 1t \tag{11}$$

$$cict = \sum_{i=1}^{n} \delta icict - 1 + \sum_{j=1}^{n} \gamma jGDPt - 1 + \mu 2t \tag{12}$$

Where it is assumed that the disturbances u_{1t} and μ_{2t} are uncorrelated.

Estimating the parameters in equation (x) using Vector Autoregression method (VAR). In economics the dependence of a variable Y (the dependent variable) on another variable(s) X (the explanatory variable) is rarely instantaneous. Very often, Y responds to X with a lapse of time. Such a lapse of time is called a lag (Damodar N. Gujarati, 2007). Monetary policy instruments like bank rate, open market operation (which has direct effect on CIC), legal reserve ratio (reserve requirement), moral suasion etc does not have sudden effect on the performance of the economy. Example, creation of bank money through demand deposits takes some time due to the process involved, so the impact is not felt immediately. Hence, this justifies the use of vector autogression method in estimating the parameters.

4. Empirical Results and Discussion

4.1 Unit Root Test

The Elliott-Rothenberg-Stock (ERS) Unit root tests suggest that all the variables were stationary at level both at 1%, 5% and 10% except for inflation rate which is not stationary at 10%. (See Table 2). This obtained by comparing the observed values (in absolute terms) of the ERS tests with the critical values at 1%, 5%, and 10% (in absolute terms) of the ρ-statistics. Based on the analysis I accepted the null hypothesis which concludes that there is the presence of a unit root in the time series.

4.2 Testing for Cointegration of Variables

The analysis of Johansen co-integrations rank which is presented in table iii indicates the presence of five integrating vectors at 5% level of significance. By implication, this infers that there is co-integration among the variables in the long-run which is a proof of long-run relationship among the variables in the model.

Table 2. Elliott-Rothenberg-Stock Unit root test (null hypothesis: has a unit root)

Series	P-Statistic	1%	5%	10%	log (At) ~ I(X)
		ERS Regression with Constant, Linear Trend			
LOGDGP	63.94646	4.221600	5.716800	6.770800	I(0)
LOGCIC	392.115	4.221600	5.716800	6.770800	I(0)
LOGDD	109.3322	4.221600	5.716800	6.770800	I(0)
LOGHPM	133.0044	4.221600	5.716800	6.770800	I(0)
CTD	23.13982	4.221600	5.716800	6.770800	I(0)
EXR	42.1434	4.221600	5.716800	6.770800	I(0)
INF	5.793305	4.221600	5.716800	6.770800	I(0)
NIR	10.87143	4.221600	5.716800	6.770800	I(0)

Source: Author's Computation.

Table 3. Cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.984233	207.4934	56.70519	0.0000
At most 1 *	0.866990	100.8667	50.59985	0.0000
At most 2 *	0.757999	70.94064	44.49720	0.0000
At most 3 *	0.709690	61.84021	38.33101	0.0000
At most 4 *	0.553629	40.33025	32.11832	0.0040
At most 5	0.294631	17.45174	25.82321	0.4204
At most 6	0.238923	13.65101	19.38704	0.2784
At most 7	0.108732	5.755524	12.51798	0.4920

Max-eigenvalue test indicates 5 cointegratingeqn(s) at the 0.05 level.

* denotes rejection of the hypothesis at the 0.05 level.

**MacKinnon-Haug-Michelis (1999) p-values.

Source: Author's Computation.

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)   **Date:** 04/21/13   **Time:** 02:53   **Sample (adjusted):** 1962 2011
Included observations: 50 after adjustments   **Trend assumption:** Linear deterministic trend (restricted)   **Series:** LOGGDP CTD EXR
INF LOGCIC LOGDD LOGHPM NIR   **Lags interval (in first differences):** 1 to 1.

Table 4. Pair-wise granger causality test

Null Hypothesis:	Obs	F-Statistic	Probability
GDP does not Granger Cause CIC	51	1.91657	0.17264
CIC does not Granger Cause GDP		3.70421	0.06021
DD does not Granger Cause GDP	51	1.23020	0.27289
GDP does not Granger Cause DD		5.78712	0.02005

Source: Author's Estimation Using E-view 5.0.

Pairwise Granger Causality Tests   **Date:** 04/11/13   **Time:** 17:19   **Sample:** 1960 2011   **Lags:** 1.

We regard this result as a piece of empirical evidence supporting the monetarist claim that money matters in economic development. Nigerian economy, like many other developing economies, is a dual economy in the sense that traditional sector coexist with a modern sector. However, the traditional sector is the most dominant since almost 80 per cent of the populations live in this sector. However, the increase in money supply does not seem to affect the output of the traditional sector which constitutes very little to GDP. This is due to the fact that the economic activity of this sector is exclusively determined by exogenous forces. This might be one reason why the magnitude of causation that was found between CIC and normal GDP is minimal at least in the short run.

The direction of causality between demand deposit and GDP was unidirectional. That is, the direction of causation runs from demand deposit to GDP and not otherwise. The implication of this result is that economies with more demand deposit can boost their productive through improvement in the GDP. Increase in demand deposit will reduces the cost of handling cash and other associated risks which will lead to increase in financial sector contribution to GDP.

4.4 Vector Autogression (Var)

The foremost object of this study is to empirically determine the impact of CIC on economic performance in Nigeria between 1960 and 2011.The empirical analysis of equation (x) is presented in Table v. The appraisal of the vector autoregresstion revealed that previous year normal Gross Domestic Product (GDP) is positive and statistically significant at 5% between the year 1960 and 2011. A 1% increase in GDP when lagged by one year will lead to about 84.50% increase in current year normal GDP. This shows that GDP in the previous year is major determinant of current year GDP, which implied that economic performance in Nigeria depends largely on the performance of GDP in the previous years because current level of economic activities only contributed just 15.50%. This is not surprising because crude oil revenue contributed over 80% to Nigeria GDP, oil windfall revenue is not judiciously utilized in diversify the economy from been a monoculture to multicultural economy, due to unprecedented level of corruption in the country. Most of the government spending on developmental projects ends in private pockets. Furthermore, the projects embarked upon by the government are not targeted towards developing the economy but to score cheap political points. The continuous dependent on oil revenue accounted for the high level of volatility of Nigerian economy to international oil price.

The empirical analysis shows that previous year CIC has no significant impact on current year normal GDP in Nigeria, although it exhibit a positive relationship. The result shows that 1% increase in previous year CIC will bring about 11.56% growths in current year GDP. This finding agrees with the work of Rastislav and Natalia, 2007. This result also corroborate the work of M. S. Ogunmuyiwa and A. Francis Ekone (2010), they find out that money supply is positively related to growth but the result is however insignificant in the case of GDP growth rates on the choice between contractionary and expansionary money supply. The paper suggest that the implementation of the cashless society by the Central Bank of Nigeria (CBN) should be done with the best of care so as not to reduce the contribution of the informal sector to GDP because high percentage of CIC are been used for economy activities in the informal sector which is the engine that drives growth in the local economy. Despite the rapid development of the payment card market, households prefer cash transactions to payments through POS terminals. The higher demand for cash holdings could have been supported in recent years largely by the monetary policy environment, with relatively low interest rates diminishing the attractiveness of deposit products.

The results also showed that demand deposit has a negative and not significant effect on normal GDP when lagged by one year. This means that instead of promoting economic growth and development, determinations to mobilized demand deposit have not been beneficial to the economy. This indicates that demand deposit did not stay long enough in the banking system, thus may not go through the money creation process which helps in promoting economic growth. Banks create money through their lending activities and the higher the excess reserves in the possession of commercial banks the higher the loans and deposits that could be created and therefore the higher the money supply. Phebian (2010), Ogunmuyiwa and Ekone, (2010) and Ahmed and Suliman (2011) in their various papers found that increase in money supply also leads to improve economy performance.

Table 5. Vector autogression (VAR)

	LOGGDP
LOGGDP(-1)	0.844953
	(0.07749)
	[10.9044]
C	39022.63
	(15242.9)
	[2.56005]
LOGCIC$_{t-1}$	0.115699
	(0.18073)
	[0.64017]
LOGDD$_{t-1}$	-0.002153
	(0.01785)
	[-0.12058]
LOGCTD$_{t-1}$	-25604.01
	(10657.3)
	[-2.40249]
LOGHPM$_{t-1}$	-0.024039
	(0.07506)
	[-0.32027]
EXR$_{t-1}$	346.0910
	(316.339)
	[1.09405]
INF$_{t-1}$	205.4257
	(298.984)
	[0.68708]
NIR$_{t-1}$	972.5165
	(1190.22)
	[0.81709]
R-squared	0.989782
Adj. R-squared	0.987836
Sum sq. resids	2.78E+10
S.E. equation	25713.16
F-statistic	508.5486
Log likelihood	-585.3076
Akaike AIC	23.30618
Schwarz SC	23.64709
Mean dependent	232440.0
S.D. dependent	233137.4

Source: Author's Computation

Vector Autoregression Estimates   **Date:** 04/20/13   **Time:** 23:5   **Sample (adjusted):** 1961 2011   **Included observations:** 51 after Adjustments   Standard errors in ( ) & t-statistics in [ ]

The ratio of CIC to demand deposit (measure of electronic payment system development) lagged by one year shows that as the economy is moving from cash to cashless the impact is negative and it is significant at 5%. This is as a result of infrastructural bottlenecks (Reliable Internet facility, Good and effective telecommunication system, Electricity, Reliable banking system, etc.) to power the electronic payment system. Central bank of Nigeria and other stakeholders needs to embark on public enlightment program so as to increases people confidence in the electronic payment system.

The result reveals that high powered money (HPM) or monetary base in the previous year has negative relationship with normal GDP which is not significant at 5%. This implies that a larger proportion of HPM is in form of CIC, the credit creation ability of bank will be curtailed because such money will not be available in the financial system for credit creation.

Econometric analysis on normal interest rate when lagged by one year shows that between 1960 and 2011 normal interest rate exerts a positive but insignificant impact on normal GDP in Nigeria. This outcome is in confinement with the findings of Ndekwu (1998) and Owoye and Onafowora (2007) that high interest rate stimulates supply of savings but high cost of borrowing discourages investment and retards growth in Nigeria. This was the reason for continuous increased in broad money supply (M_2) over the years.

It is discovered that all the monetary target variables exerts an insignificant impact on normal GDP in Nigeria from 1960 to 2011 except CIC to demand deposit ratio. The relationship that exists between the monetary instruments and normal GDP, sheds more light on how ineffective monetary policies adopted by the CBN for promoting economic growth in Nigeria. The combination of monetary variables like; exchange rate, Inflation, normal interest rate, high power money, exchange rate and CIC has not been effective for the purpose of promoting growth in GDP, as the vector autogression result shows that they are statistically insignificant.

5. Conclusion and Policy Implications

The main emphasis of this study was to empirically analyze the impact of CIC on economic performance in Nigeria using annual statistical data from Central Bank Nigeria (CBN) between 1960 and 2011 within an empirical framework using vector autoregresstion model (VARM) and the direction of Granger Causality relationship between CIC, demand deposit and normal GDP. The model estimated in this study follows a modern quantity theory of money (MQTM). Also, Unit root test is carried out to avoid spurious regression and to facilitate Granger Causality test since the assumption of stationarity is essential, as well as cointegration analysis. The results of the study indicate clearly that a long run cointegration relationship exists between normal GDP and its explanatory variables, namely normal GDP_{t-1}, normal interest rate, the real exchange rate, CIC, demand deposit, high power money, ratio of CIC to DD and inflation rate.

According to the results, the coefficient of CIC when lagged by one period is positive but statistically insignificant at 5% contrary to expectations. Normal GDP in the previous year exhibited a positive relationship with the current year normal GDP and statistically significant as expected. Contrary to theoretical expectation the coefficient of demand deposit is negative and statistically insignificant; this is a serious deviation from economic theory which is an indication of weak financial institutions not been able to mobilized deposits from the informal sector to boost economic growth. There was statistically insignificant relationship among monetary variables such as exchange rate, Inflation, normal interest rate, high power money, and normal GDP within the period under review. The direction of causality run from CIC to normal GDP, Granger Causality test also indicates that demand deposit granger causes GDP. The implication of this result is that economies with more demand deposit can boost their productive through improvement in the GDP. Increase in demand deposit will reduces the cost of handling cash and other associated risks which will lead to increase in financial sector contribution to GDP.

Empirical analysis in this study shows that the CIC_{t-1} have a complementary relationship with current year normal GDP but does not have any significant influence on normal GDP in Nigeria between 1960 and 2011.

Based on the findings, the cashless economy been proposed and promoted by the monetary authorities will have a significant impact on the performance of Nigeria economy. The government should provide adequate infrastructure and all enabling legal framework that will help the informal sector of the economy to embrace the cashless payment system, so as not to erode the diminutive contribution of the informal sector to GDP in Nigeria. The study also revealed that demand deposit granger causes economic growth so government should encourage deposit by increasing the deposit rate and enact adequate laws that will protect depositors.

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