SECTORAL EFFECT OF GOVERNMENT SPENDING ON ECONOMIC GROWTH IN NIGERIA

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Abstract - The paper examined the effects of government spending on health care and agriculture on economic growth in Nigeria from 1981-2016.Government expenditure is essential through which economic growth could be achieved. We used the quasi-experimental research approach and the data for analysis were purely time series econometrics technique to examine the short and long run effects of government spending on economic growth in Nigeria. The study utilized the Error Correction Model (ECM) and the ADF Unit Root Test was conducted to test for Stationarity of variables, where at various levels of significance (1%, 5%, and 10%), the variables were stationary. That is, RGDP, EXHTH and EXAGR were integrated at order one 1(1). Granger Causality Test to ascertain the direction of the effect of the variables was also conducted. The results showed a unidirectional causality between the EXHTH and RGDP as well as EXAGR and RGDP. Meaning, that total spending on agriculture and total spending on health care granger causes economic growth in Nigeria during the period of study. The result of the analyses is an indication that government spending on health care and agriculture in Nigeria are statistically significant and are positive to economic growth in the long run. Therefore, the paper concludes and recommends that government in Nigeria should increase its expenditure on health care services delivery and agriculture in order to accelerate real economic growth, especially as the economy is gradually exiting recession.

Keywords - Economic Growth, Agriculture, Error Correction Model, Health Care. Public expenditure

I. INTRODUCTION

Public expenditure is an important instrument in the hands of government in bringing about economic growth which is one of the macroeconomic goals of governments at all levels. Government spending to accelerate effective demand in order to achieve real economic growth has been a clarion call by policy makers and scholars, especially in an economy like Nigeria that is gradually moving out of recession (Okumoko and Krokeyi, 2017). The Keynesians believe that during economic crises, of the sort Nigeria is experiencing, government could reposition the economy through productive spending and encourage effective demand to re-fix the economy by increasing disaggregated and sectoral expenditure on health care and agriculture. Agriculture is the largest sector in Nigeria which has contributed majorly to the GDP as it is the largest employer of labour. The general view is that government expenditure on social and economic infrastructure can be growth enhancing although the financing of such expenditure to provide essential infrastructural facilities including transport, electricity, telecommunication, water and sanitation, waste disposal, education and health can be growth retarding (Olukayode, 2009).

It is argued that the relationship between government expenditure and economic growth has continued to generate series of controversies among scholars in economic literature. While some scholars believed that the impact of government expenditure on economic growth is negative or non-significant (Taban, 2010; Vu Le and Suruga, 2005), others believe that the impact is positive and significant (Alexiou, 2009; Belgrave and Craigwell, 1995). Baro(1990) predicts that only those productive government expenditures will positively affect the long run growth rate. Solow (1956) argues that, productive government expenditure may affect the incentive to invest in human or physical capital, but in the long-run this affects only the equilibrium factor ratios, not the growth rate, although in general there will be transitional growth effects. Other scholars have argued that expenditure on infrastructure such as road, power etc, reduces production costs, increase private sector investment and profitability of firms, thus ensuring economic growth (Barro, 1990; Barro and Sali-i-Martin, 1992; Roux, 1994; Okojie, 1995; Morrison and Schwartz, 1996).

In the same vein, others argued that growth in government spending, mainly based on non-productive spending is accompanied by a reduction in income growth has given rise to the hypothesis that the greater the size of government intervention the more negative is its impact on the economy (Glomm and Ravikumar, 1997; Abu and Abdullah, 2010). Public spending has been on the rise over the years with little or no positive real impact on the economy as the country records worsening state of infrastructures that could not enable real economic growth in Nigeria. However, for Nigeria to experience real positive economic growth out of recession, an examination of the impacts of public expending on economic growth is essential. The study, therefore, examined the impacts of government sectoral spending on economic growth in Nigeria by empirically estimating and analyzing the effects of sectoral health care and agricultural spending on economic growth in Nigeria. The paper is divided

into five sections. Section two reviews related literature, section three is the methodology, section four is data presentation and analyses. Section five is conclusion and recommendations.

II. LITERATUREREVIEW

2.1 THEORETICAL LITERATURE

There are many theories that explains government expenditure and economic growth. These are;

Wagner's Law/ Theory of Increasing State Activities: This is a law named after the German Political Economist Adolph Wagner (1835-1917) who developed the "law of increasing state activity" after an empirical analysis on Western Europe at the end of the 19th century. According to him, government growth is a function of increased industrialization and economic development and that as the real income per capita of a nation increases, the share of public expenditures in total increases. In 1893, he designed three bases for the increase in state expenditure.

He said, during industrialization, public sector activities tend to replace private activities and that state functions like administrative and protective functions will increase. Secondly, government needed to provide cultural and welfare services like education, public health, old age pension or retirement insurance, food subsidy, natural disaster aid, environmental protection programs and other welfare functions. Thirdly, increased industrialization will bring about technological transformation and large firms tends to monopolize by yearning for larger market share, as a result, governments would have to avert the effects through the provision of social and merit goods. This law is further corroborated by Musgrave and Musgrave (1988) where it says that as progressive economies industrializes, the share of the public sector in the national economy grows progressively

Peacock and Wiseman Theory of Public Expenditure: Peacock and Wiseman in 1961 developed the pattern of increase in government expenditure because of their study of public expenditure in England. In 1967, they averred that the growth of public expenditure does not occur because of increase state activities; rather it is the political prepositions instead of the organic state where it is considered that government like to spend money, and peoples' dislike of increasing tax but want government to increase social services.

Musgrave Theory of Public Expenditure Growth: Musgrave and Musgrave propounded this theory due to noticeable changes in the income elasticity of demand for public services in three areas of per capita income. Musgrave averred that at low levels of per capita income, demand for public services tends to be very low, this according to him, satisfies primary needs and that increase in income leads to a rise in the demand for public services like health care, education and transport and government would be left with no option than to increase expenditure on such public goods.

The Keynesian Theory: TheKeynesian theory of employment posits that government expenditure leads to economic growth and development especially its importance in stimulating the economy at the long run. The Keynesian theory of employment indicates the functional relationship as $Q = f(K)$ … (2.1), where; Q represents the rate of employment, K represents the government expenditure. From the above functional equation, government can reduce unemployment through it expenditure. Keynes considers government expenditure as the only means to stimulate the economy for growth, hence, he recommends that government increase its expenditure.

2.2 EMPIRICAL LITERATURE

Studies on government spending and economic growth abound in underdeveloped, developing and developed economies like Nigeria with different results. Alexander (1990) applied OLS method with a sample of 13 Organization for Economic Cooperation and Development (OECD) countries panel during the period ranging from 1959 to 1984. The results show that growth of government spending has significant negative impact on economic growth. It therefore implies that government expenditure is critical to economic growth. Foster and Skinner (1992) evaluated the relationship between government expenditure and economic growth for a sample of wealthy countries for 1970-1995, using various econometric approaches. They found a positive relationship between public sector expenditure and economic growth. The result of Foster and Skinner (1992) is a clear indication of the importance of public spending in bringing about economic growth. Josaphat and Oliver (2000) investigated the impact of government spending on economic growth in Tanzania (1965-1996) using time series data for 32 years. They formulated a simple growth accounting model, adapting Ram model in which total government expenditure is disaggregated into expenditure on (physical) investment, consumption spending and human capital investment. It was found that increased productive expenditure (physical investment) have a negative impact on growth and consumption expenditure relates positively to growth, and which appears to be associated with increased private consumption. The results revealed that expenditure on human capital investment was insignificant in their regression and confirm the view that public investment in Tanzania has not been productive, as at when the research was conducted.Devarajan and Vinay (1993) used panel data for 14 developed countries for a period ranging from 1970 to 1990 and applied the Ordinary least square method on 5-year moving average. They took

various functional types of expenditure (health, education, transport, etc) as explanatory variables and found that health, transport and communication have significant positive effect while education and defense have a negative impact on economic growth Gregorious and Ghosh (2007) made use of the heterogeneous panel data to study the impact of government expenditure on economic growth. Their results suggest that countries with large government expenditure tend to experience higher economic growth. Fajingbesi and Odusola(1999) empirically investigated the relationship between government expenditure and economic growth in Nigeria over the period 1970 to 1995. The econometric results indicated that real government capital expenditure has a significant positive influence on real output. However, the results showed that real government recurrent expenditure affects economic growth only by little. Abu and Abdullah (2010) investigates the relationship between government expenditure and economic growth in Nigeria from the period ranging from 1970 to 2008.They used disaggregated analysis to unravel the impact of government expenditure on economic growth. The results of their study reveal that government total capital expenditure, total recurrent expenditure and Education have negative effect on economic growth. Though, the findings of Abu and Abdullah (2010) shows negative relationship between government expenditure and economic growth, however, majority of the studies reviewed indicate strong positive relationship between public spending and economic growth. These, further explains the fact that government expenditure on health care and agriculture have positive relationship with economic growth.

Health is also important for economic growth and development due to the central importance of man in the growth and development process of an economy. On the same vein, studies have been conducted to confirm the positive effects of health care investment and economic growth. For instance, Grossman (1972) averred that people are born with initial endowments that depreciate over time but can grow with investments in health. Grossman (1972) further argued that increase in health capital reduces the time lost to illness and thus, heal and allows more effective performance that increases productivity. Jack (1999) found that the productivity of a labour force depends on investments in human capital and the physical and mental capabilities of the workforce. Bloom and Canning (2000) indicates that healthy communities or populations tend to have enhanced physical abilities and mental clarity which in turn increases productivity. In a bid to echo the imperatives of health to development, Sorkin (1977) says that in areas where economic activity has been hindered owing to unfavorable health condition, an investment into a robust major health programmes could be a catalyst to promote development.

III. MODEL SPECIFICATION

This study adopts the Vector Error Correction Model (VECM) approach to examine the impact of government spending in Health Care and Agriculture on economic growth in Nigeria.Davidson and Mackinnon (1993), Bannergee (1993), and Verbeck (2000)states that Vector Error Correction Model (VECM) is a derivation of autoregressive distributed lag (ADL) model. In the same light, Armorer (1996), Engert and Hendry (1998) found Vector Error Correction Model to be a good tool for public expenditure and economic growth forecasting.

The model hence estimates that:

$$\mathbf{Yt = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \mu \ldots\ldots\ldots\ldots\ (3.1)}$$

Where Yt represents the real gross domestic product (RGDP), β_0 is the intercept term, β_1 and β_2 are the regression coefficient, X_1, X_2 are the set of baseline explanatory variables and μ is the stochastic random variable.

The modified version of the above model is as follows:

RGDP = (EXHTH, EXAGR)……. (3.2)

The functional and econometrics effect of government expenditure in health care and agriculture on economic growth is stated as;

RGDP = f (EXHTH,EXAGR) ….. (3.3)

$$\mathbf{RGDP = \beta_0 + \beta_1\ EXHTH + \beta_2 EXAGR + \mu \ldots\ldots\ (3.4)}$$

Where:

RGDP isReal Economic Growth, EXHTH isHealth Care expenditure, EXAGR is Educational expenditure, μ is stochastic random variable, Bo is intercept parameter, β_1& β_2 are Slope parameters and t is Time /Period. On the apriori it is expected that; $\beta_1 > 0$, and $\beta_2 > 0$.

Estimation Technique and Procedure

ADF Unit Root Test

The study conducted a stationarity test for each of the variables by employing the augmented Dickey-Fuller test proposed by Dickey and Fuller (1979) to check for the stationarity properties of the variables to avoid any spurious regression. The general form of ADF is estimated by the following regression

$$\mathbf{\Delta Ydt = \beta_0 + \beta_1 Yd\ t_{-1} + \sum \beta_1 \Delta Ydi + {}^{\delta}t + \mu t \ldots\ldots\ (3.5)}$$

Where : Yd is a time series, t is a linear time trend, Δ is the first difference operator, β_0 is a constant, t_{-1} is the optimum number of lags in the independent variables and μ is random disturbance term.

The Granger Causality Test

Granger causality test shows the direction of the effect between the two time series. This effect could take the form of bilateral, bidirectional, unidirectional and independent causality. The general form of granger causality is estimated by considering two variables which are Real Gross Domestic Product (RGDP) and Health Care expenditure (EXHTH) and

Real Gross Domestic Product (RGDP) and Agricultural expenditure in the following regressions:

$$\mathbf{RGDP\ t = \sum_{t=1}^{n} + \psi EXHTH\ t_{-1} + \sum \Omega\ RGDPt_{-1} + \varepsilon_1 t} \quad \mathbf{\ldots\ldots..(3.6)}$$

$$\mathbf{t = 1t = 1}$$

$$\mathbf{EXHTH\ t = \sum_{t=1}^{n} + \omega_1 RGDPt_{-1} + \sum_{t=1}^{n} \theta 1 EXHTHt - 1 + \varepsilon 2t \ldots\ldots\ldots\ (3.7)}$$

Where it is assumed that the disturbances e1t and e2t are uncorrelated in the two variables case is called bilateral causality. However, the RGDP and EXHTH in the equations above, the case of unidirectional causality from RGDP to EXHTH exists if the set of lagged EXHTH coefficients in (3.4) is not statistically different from zero (i.e., $\sum \omega_1 \neq 0$) and the set of the lagged RGDP coefficients in (3.5) is statistically different from zero (i.e., $\sum \theta_1 \neq 0$).

$$\mathbf{RGDP\ t = \sum_{t=1}^{n} + \psi EXAGR\ t_{-1} + \sum \Omega\ RGDPt_{-1} + \varepsilon_1 t} \quad \mathbf{\ldots\ldots\ldots..(3.8)}$$

$$\mathbf{t = 1t = 1}$$

$$\mathbf{EXAGR\ t = \sum_{t=1}^{n} + \omega_1 RGDPt_{-1} + \sum_{t=1}^{n} \theta 1 EXAGRt - 1 + \varepsilon 2t \ldots\ldots\ldots\ (3.9)}$$

Where it is assumed that the disturbances e1t and e2t are uncorrelated in the two variables case is called bilateral causality. However, the RGDP and EXAGR in the equations above, the case of unidirectional causality from RGDP to EXAGR exists if the set of lagged EXAGR coefficients in (3.4) is not statistically different from zero (i.e., $\sum \omega_1 \neq 0$) and the set of the lagged RGDP coefficients in (3.5) is statistically different from zero (i.e., $\sum \theta_1 \neq$).

Where it is assumed that the disturbances e1t and e2t are uncorrelated in the two variables case is called bilateral causality. However, the RGDP and EXAGR in the equations above, the case of unidirectional causality from RGDP to EXAGR exists if the set of lagged EXAGR coefficients in (3.4) is not statistically different from zero (i.e., $\sum \omega_1 \neq 0$) and the set of the lagged RGDP coefficients in (3.5) is statistically different from zero (i.e., $\sum \theta_1 \neq 0$).

3.1 Data Presentation

This research examined the government spending and economic growth in Nigeria during the period 1980-2016. A growth model was estimated for the Nigerian economy. The real gross domestic product (GDP) was employed as the proxy for economic growth. While, expenditure on agriculture (EXAGR) and expenditure on health care (EXHTH)were the set of explanatory variables. All the variables are in Million Naira (₦ m). See Table 4.1 at the appendix

Table 4.1,at the appendix shows that the growth in the GDP fluctuates between 1980 and 1987 and then increase progressively from 1988 to 2015 before economic recession in 2016. Furthermore, table 4.1 equally showed that total government expenditure on agriculture and health care service witnessed a fluctuation in increase between the periods of 1980-2016.The trend in the various variable used for the analysis is presented in the graphs below.

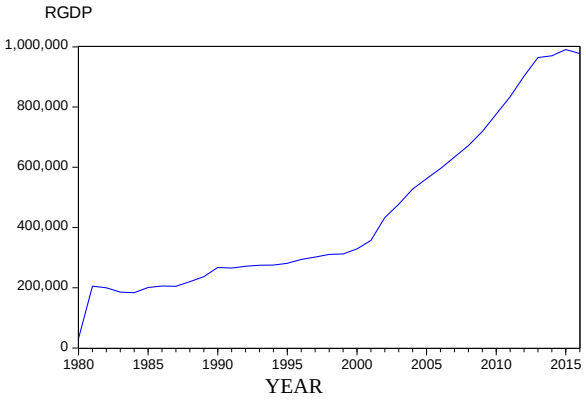


Figure 4.1: Line Graph Showing the Trend in RGDP

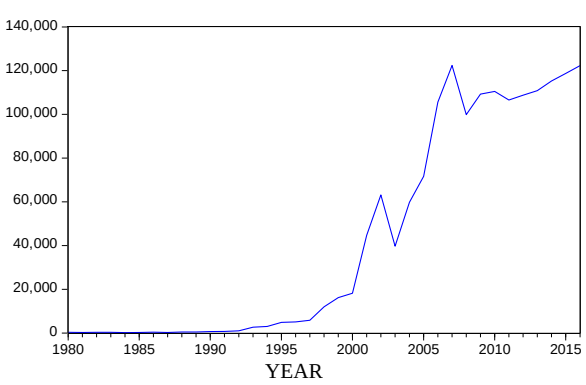


Figure 4.2: Line Graph Showing the Trend in Government Expenditure on Agriculture

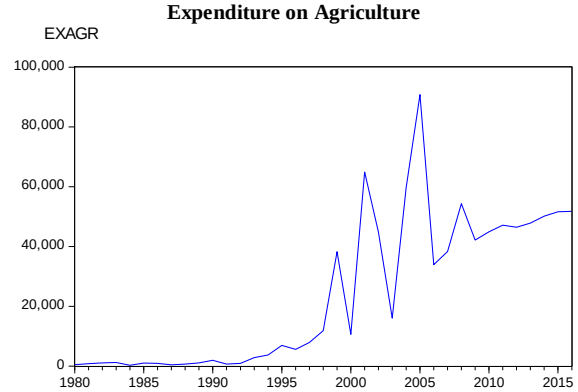


Figure 4.3: Line Graph Showing the Trend in Government Expenditure on Health Care

3.2 Empirical Data Analysis

The empirical analysis focused mainly on descriptive statisticsand estimation of the regression result model amongst others

3.2.1 Descriptive Statistics for Underlying Series

The essence of the descriptive statistics is to ascertain stability of the time series

Table 4.2: Descriptive Statistics for Underlying Series

	RGDP	EXHTH	EXAGR
Mean	443848.7	42766.39	23896.90
Std. Dev.	278949.8	49307.85	25256.05
Skewness	0.760550	0.571232	0.659883
Jarque-Bera	4.337965	5.259502	3.427346
Probability	0.114294	0.072096	0.180203

Source: Researcher's Computation from (E- view 9)

The descriptive statistics reported in Table 4.2 indicated that real gross domestic product (RGDP), expenditure on health care (EXHTH) and expenditure on agriculture (EXAGR) averaged₦443848.7million, ₦42766.9millionand ₦ 23896.9million respectively. The standard deviation showed that the dependent variables (GDP) converged around it mean. While, the independent variables (total expenditure on health care and expenditure on agriculture) do not converged around their respective mean. The skewness test result showed positive values for all the seriesmeaning, they have high tails. The probability of Jarque-Bera statistics suggest that the null hypothesis of normal distribution for RGDP, total expenditure on health care and expenditure on agriculture are accepted at 5% level. This is because the probability of the Jarque-Bera of the respective variable is greater than 0.05% probability level.

3.2.2 Correlation Test

This study employed correlation matrix to check whether the explanatory variables can be regressed together. The correlation matrix result is presented in Table 4.3

Table 4.3 Correlation Matrix of the Series

VARIABLES	RGDP	EXHTH	EXAGR
RGDP	1.00000	0.9488704	0.764892
EXHTH	0.9488704	1.0000	0.8168319
EXAGR	0.7648921	0.81683191	1.0000

Source: Researcher's Computation from (E- view 9)

The correlation matrix result presented in Table 4.3 showed that the correlation coefficient depicting the relationship between each of the explanatory variables is below 0.94 which Gujarat (2004) describes as evidence of severe multicollinearity. Hence, the variables can be regressed together without the problem of multicollinearity. Specifically, RGDP, EXHTH and EXAGR has strong positive correlation of 94 81% and 76% respectively.

3.2.3 The Unit Root Test

The Augmented Dickey Fuller (ADF) test was used to investigate stationarity and the order of integration of the variables.

Table 4.4: Unit Root Stationarity Test (1980-2016)

Variables	ADF Test @ Level	Critical Value			ADF Test @ 1ST Diff	Critical Value			Order of Integration
		1%	5%	10%		1%	5%	10%	
RGDP	2.40595	-3.6329	-2.9484	-2.6128	-6.74129	-3.6329	-2.9484	-2.6128	1(1)
EXHTH	0.12378	-3.6267	-2.9458	-2.6115	-5.86415	-3.6329	-2.9411	-2.6128	1(1)
EXAGR	-0.59236	-3.6394	-2.9511	-2.6143	-9.98808	-3.6394	-2.9511	-2.6143	1(1)

Source: Authors' Computed Result from E-views 9.0(Appendix)

The summarized result presented in Table 4.4 showed that at various levels of significance (1%, 5% and 10%), the variables were stationary,though, all the time series were not stationary at their levels. However, the non-stationarity variables were differenced. Thus, the variables became stationary at first difference. That is, RGDP, EXHTH and EXAGR were integrated of order one 1(1). Having established stationarity of the variables, the long –run relationship among the variables was conducted using the granger causality approach. The result of the pairwise granger causality test is reported in Table 4.5 below.

3.2.4 Granger Causality Test

Granger causality test shows the direction of effect between two time series. Such effect could be bilateral, bidirectional, unidirectional and independence causality. In order to find out the direction of the government expenditure on economic growth, the Pairwise Granger Causality Test was conducted.

Table 4.5: Pairwise Granger Causality Test Result

Variables	Observation	F-Statistic	Prob.	Decision
(EXHTH) → (RGDP)	35	5.46481	0.0095	**Reject Ho**
(RGDP) → (EXHTH)		0.56698	0.5732	Accept Ho
(EXAGR) → (RGDP)	35	5.09552	0.0124	**Reject Ho**
(RGDP) → (EXAGR)		1.85325	0.1742	Accept Ho

Source: Researcher Computation (E-view 9.0)

Note:→ means does not granger causeRGDP, EXHTH and EXAGR as earlier defined

The results presented on table 4.5 showed a unidirectional causality between the EXHTH and RGDP as well as EXAGRand RGDP. Meaning that total expenditure on agriculture and total expenditure on health care Granger causes economic growth in Nigeria during the period of study. This means that the variables; government expenditure on health careand agriculture impact on economic growth.

3.3 Discussion of Findings

3.3.1 Government Expenditure on Health Care and Economic Growth in Nigeria

The analysis of the empirical result as revealed by the Granger causality test showed thatgovernment expenditure on health carehas a significant impact on

economic growth. Therefore, a unit increase in government expenditure in the health sector will significantly spur the growth of the Nigerian economy.

3.3.2 Government Expenditure on Agriculture and Economic Growth in Nigeria

The analysis of the empirical result depicted by the Granger causality test showed thatgovernment expenditure on agriculturehas a significant impact on economic growth. Thus, a unit increase in government expenditure in the agricultural sector will have a significant and positive impact on economic growth in Nigeria.

CONCLUSION AND RECOMMENDATIONS

CONCLUSION

The findings of this study show that total government expenditure on health care (EXHTH) and agriculture (EXAGR) have significant effects on Gross Domestic Product (GDP). The National Bureau of Statistics (NBS) reported that Nigeria is gradually moving out of economic recession at 0.55 per cent. The analyses of the empirical results are truth to fact indication that if government of Nigeria increases expenditure on health and agriculture, it would have a significant impact on economic growth. Thus, an increase in government spending in health and agriculture sectors would have a significant boost on economic growth in Nigeria.

RECOMMENDATIONS

The study recommends that:

1. Nigeria government should increase its spending on health care services to encourage healthy nation and enhance productivity.
2. Government should direct its spending on productive sector like the agriculture sector that will create more job opportunities for the unemployed and provide agricultural output for local consumption and eventual exports.
3. To achieve development in these sectors that would further boost the economy, corruption in these sectors and others should be properly checkmated so that funds meant for the development of these sectors shall be religiously utilized and expended to achieve desired goals.

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APPENDIX

Table 4.1: Data on Nigeria's RGDP, EXAGR and EXHTH from 1980-2016

YEAR	RGDP(₦ m)	EXAGR (₦ m)	EXHTH (₦ m)
1980	31546.08	468.1	302.5
1981	205222.1	809	248.2
1982	199685.2	1069.2	286
1983	185598.1	1214.5	279.6
1984	183563	285.3	190.2
1985	201036.3	1018.1	223.5
1986	205971.4	925.4	360.4
1987	204804.5	394.3	236.4
1988	219875.6	650	443.2
1989	236729.6	1062.6	452.6
1990	267550	1966.6	658.1
1991	265379.1	672.299	757
1992	271365.5	924.5	975.4
1993	274833.3	2835.3	2684.5
1994	275450.6	3719.1	3027.8
1995	281407.4	6927.7	4851.5
1996	293745.4	5574	5060.9
1997	302022.5	7929.6	5803
1998	310890	11840.4	11984.3
1999	312183.5	38259.8	16180
2000	329178.7	10596.4	18181.8
2001	356994.3	64943.9	44651.5
2002	433203.5	44803.8	63171.2
2003	477533	16045.2	39685.5
2004	527576	59773.4	59787.4
2005	561931.4	90798.2	71685.3
2006	595821.6	33916.6	105590
2007	634251.1	38300	122400
2008	672202.6	54338.3	99891.8
2009	718977.3	42184.95	109293.9
2010	776332.2	44941.08	110528.6
2011	834161.9	47154.81	106571.4
2012	902794	46426.9	108798
2013	964184	47840.9	110834.26
2014	969969.1	50137.27	115267.63
2015	990690.7	51641.39	118725.63
2016	977740.42	51796.31	122287.4

Source; CBN Statistical Bulletin Various Issues

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