

## The Nexus between Money Market Operations and Economic Growth in Nigeria: An Empirical Investigation

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### ABSTRACT

*This study empirically examine the nexus of money market operations on economic growth in Nigeria. The study made use of secondary data which were obtained from the Central bank of Nigeria Statistical Bulletin (2013). The data were collected for a period of thirty three years (1980-2013). The descriptive statistical tools and sophisticated econometric tools of the vector auto-regressions (VAR), Johansen Co-integration, and Granger causality tests was employed in the analysis of the data. It was found among other things that there is a positive significant short-run and long-run relationship between money market operations and economic growth in Nigeria. The result shows that causality flows from economic growth proxy by GDP to money market operations but not vice versa. Based on the empirical analysis, it is concluded that money market operations delivers short term growth tendencies and can help to ensure long run impressive and steady growth rates in Nigeria as it is a key component of the financial system, a fulcrum of monetary operations conducted by the central bank in its pursuit of monetary policy objectives. It is recommended that, the government should both in short and long-run prioritized policies geared towards increasing/developing money markets operations in Nigeria in order to make the economy more stable.*

**Keywords:** Money Market, Money Market Instruments, Economic Growth

### I. INTRODUCTION

The money market is an integral part of Nigeria economy as it plays a very vital role in the economic growth process of the country (*Kehinde and Adejuwon, 2011*). It also play a key role in banks' liquidity management and the transmission of monetary policy by providing the appropriate instruments and partners for liquidity trading, the money market allows the refinancing of short and medium-term positions and facilitates the mitigation of your business' liquidity risk.

The banking system and the money market represent the exclusive setting in which monetary policy operates. A developed, active and efficient money market enhances the efficiency of central bank's monetary policy and the transmission of its impulses into the economy. (*Nwosu and Hamman 2008, Ehigiamusoe, 2013*). Thus, the development of the money market smoothen the progress of financial intermediation and boosts lending to the economy and improves the country's economic and social welfare. Money market is a market for short-term investible fund where short term financial instruments or liquid assets are traded. Its major significance is that it is the machinery for the mobilization of Nigeria financial resources for economic growth. Investment that promotes liquidity and gives immediate income requires short term funding with maturity of within one year (*Oloyede, 1999 and Ikpefan and Osabuohien 2012*).

In developing economies like Nigeria money markets are still underdeveloped as such the absence of a well-developed money market in these countries poses a challenge in pooling funds large enough to fund private enterprises. Despite that in recent times the Nigeria money market has witnessed robust reforms and expansion, there are still some problems and challenges which the market is confronted with. The Nigeria money market is still superficial when compared to her contemporaries in some advanced and emerging economies; it is also characterized by immature secondary market, undiversified instruments, lack of proper coordination in the issuance of debt instruments, inadequate and deficient information flow among others. Can it be concluded therefore that money market operations contribute or hamper economic growth in Nigeria? This is the question which previous studies have not fully answered. It is therefore the crux of this study to answer this question by examining the nexus between money market operations and economic growth in Nigeria.

Following this introduction, the remaining part of the paper is divided into four parts. Section two deals with the theoretical framework and empirical literature while section three presents the methodology adopted for the study. Section four presents the results of data analysis, the major findings, conclusion and policy suggestions were summarized in section five.

## **II. THEORETICAL FRAMEWORK AND EMPIRICAL REVIEW**

### **A. Theoretical framework**

This study adopted Fry's theory on money market interest rates and financial development, According to *Fry (1997)* finance and financial institutions have become relevant in a world of positive information, transaction and monitoring costs and if monitoring costs are high, a simple debt instrument would dominate a more complicated state that resembles equity. His stand is that positive real interest rates act as inducement to savers and also enable banks to give credit to the most efficient firms which can make profits to pay the high rate of borrowing.

Over the years, policies regarding financial development of emerging market economies have shifted towards market-based financial systems and lessons learnt from financial crises. The approach to financial policy in developing countries has shifted from mainly direct controls to more market oriented systems. As Fry (1988) stresses the role of money markets, he points out that the real rate of interest can be reduced by financial repression as liquidity preference pushes the real interest rate above its equilibrium level. He emphasizes that money markets in which interest rates are freely determined by interaction of supply and demand are few and far in between the developing world. *Fry (1988)* asserts that a measure of financial intermediation often used is the real interest rate. When this rate hovers below its competitive levels this indicates the extent of financial repression. A positive real interest rate encourages financial savings and financial intermediation leading to an increase in the supply of credit to the private sector and hence investment. According to *Fry (1997)* a key aspect of financial liberalization is the development of the money market in which the "independent" central bank will implement indirect monetary policy. In his view, the absence of progress in the areas concerning the effect of financial development on growth follows directly from the fact that no attention is paid to the nature of banking or financial markets.

### **B. Empirical Review**

Several studies have been conducted on the relationship between financial intermediation and economic growth, but much has not been done on the money market and economic growth in Nigeria.

*Ehigiamusoe, (2013)* examines the impact of money market on economic growth in Nigeria using data for the period 1980-2012. Econometrics techniques such as Ordinary Least Squares Method, Johanson's Co-integration Test and Vector Error Correction Model were

used to examine both the long-run and short-run relationship. Evidence from the study suggest that though a long-run relationship exists between money market and economic growth, but the present state of the Nigerian money market is significantly and negatively related to economic growth. The link between the money market and the real sector of the economy remains very weak. This implies that the market is not yet developed enough to produce the needed growth that will propel the Nigerian economy because of several challenges. It was therefore recommended that government should create the appropriate macroeconomic policies, legal framework and sustain the present reforms with a view to developing the market so as to promote productive activities, investments, and ultimately economic growth.

*Maduka and Onwuka, (2013)* investigate both the long run and short run relationships between financial structure and economic growth using time series data. The presence of a unit root in the time series data was tested using Augmented Dickey – Fuller and Philips – Perron tests. The long run relationship among the variables is estimated using *Johansen and Juselius (1990)* maximum likelihood procedure. While the vector error correction model is used to estimate short run the dynamic coefficients. The main results reveal that financial market structure has a negative and significant effect on economic growth based on Nigeria data. This suggests a low level of development of the country's financial sector. The paper therefore recommends that there is a need to put appropriate financial policies in place that will encourage the growth per capita GDP.

*Ikpefan and Osabuohien, (2012)* investigates the interactions between discount houses, money market instruments and economic growth in Nigeria. The study captured their performance indicators and employed time series data obtained from Central Bank of Nigeria. Employing co integration and vector error correction techniques, it was established, among others, that a long-run relationship exists between discount houses operations and economic growth on one hand and money market instruments, on the other. This implies that discount houses can serve as a veritable stimulant in Nigeria especially in this era of global economic melt-down that is biting hard on the Nigerian stock market.

*Harris (1979)* also gives evidence on the impact of money markets that operate in a financially deepened environment. In his study on the impact of financial deepening on investment, Harris finds that Korea and Taiwan are the countries which benefited most from money market activity which was financially deepened. The results of the study are supported by OLS estimations.

*Ikhide (1992)* conducted a study on financial deepening (development), credit availability and efficiency on 17 African countries and the results showed that real interest rates turned out positive and significant in 12 of the countries under study. As a result, the conclusion made was that there was a positive relationship that existed between financial liberalization and financial development.

*Pagano (1993)* points out that the problem with using highly aggregated indicators of financial development for evidence is that they tend to neglect the fact that the effects could vary depending on the specific market where it occurred. He, however, finds a positive effect of financial development on economic growth in that the proportion of savings channeled to investment can be raised. Financial development can influence the Private savings rate and may increase the social marginal productivity of capital.

A survey undertaken by *Seck & Nil (1993)* reports on the empirical findings on the relation between financial saving and movements in real interest rates in nine African countries including Egypt, Nigeria, Côte d'Ivoire, and Ghana. These countries placed emphasis on full or partial liberalization of interest rates, and on partial lifting of restrictions on the allocation of credit. A significant relationship between financial saving and the real interest rate lagged one period using data for 1966–90 period was eminent in Egypt whilst there also appeared to be strong support for the interest rate liberalization hypothesis over the

period 1960–91 in Nigeria, as both real interest rates and real income were significant determinants of financial saving. In their analysis of countries which have experienced structural adjustment programs. *Seck & Nil (1993)* found a strong positive relation between financial saving and the real deposit rate of interest but also found that curbing inflation was more beneficial than raising the nominal rate of interest.

An overview of the growing awareness of the potential role of money markets in the development of market-oriented financial systems was carried out by *Cole et al (1995)*. They noted that countries that had no need for central government borrowing performed poorer than those with significant government debt which fostered the development of debt markets. Furthermore, an attempt to develop close substitute instruments as tools of monetary policy by some countries was largely unsuccessful as a result of the markets being too small and the instruments not being valued at market prices.

*Callier (1995)* advances that Africa has been carrying out financial deepening since 1965 though it still lags behind compared to the rest of the world. However, the study finds some links between financial development and growth and identifies the obstacles to the development of money markets in Africa. It concludes that there are three main components of a policy towards the development of money markets in Africa. These include sound macroeconomic management; promotion of transparency and information, and of incentives to act upon available information; and institution building (regulatory and prudential framework, strengthening of professional bodies, improvement and modernization of the payment system and of the clearing and settlement procedures for securities transfers.

In a study by *Cole et al (1995)* on money markets in Asia, the key to understanding the development of money markets was dependent on government policy. Government policy, which responds to the needs of the country, was seen as a major hindrance to development of money markets. The study focused on a group of countries that were put into categories indicating the basic financial policy stance of their governments. These countries included Singapore, Hong Kong, Malaysia and Korea amongst others

### III. METHODOLOGY

Two categories of techniques are employed in the study: descriptive and econometric tools. Descriptive statistical analyses are employed in the presentation and preliminary analysis of data. Among others, the study utilizes such measures as the mean, median, standard deviations, skewness and kurtosis, and the jarque-Bera statistic. To determine the relationship between the variables implicated in the associated model econometric tools were used. The Ordinary Least Squares is adopted to investigate the short run relationship between money market instruments and economic growth. While Johanson's Cointegration Test is employed to test the long run dynamics. Appropriate levels of analysis are conducted in each case ranging from the global analysis (that reveals the overall utility of the models) to analysis of relative statistics that test the hypotheses. The study also conducts some diagnostic tests of the models specified. Accordingly the F-statistic, t-statistic and adjusted coefficient of determination are used to test the hypotheses. The secondary data used for this study covers the period 1980-2013 were obtained from the Central Bank of Nigeria Statistical Bulletin for 2013 and Nigeria Stock Exchange Fact book for 2012.

#### A. MODEL SPECIFICATION

A functional relationship between *GDP, TBL, BAC and COM* is stated as:

$$GDP_t = f(TBL_t, BAC_t, COM_t) \dots\dots\dots (1)$$

Equation 1 can be represented explicitly as:

$$GDP_t = \beta_0 + \beta_1 TBL_t + \beta_2 BAC_t + \beta_3 COM_t + \mu \cdot t \dots\dots\dots (2)$$

Where:  $\beta_0$  = Constant term

$\beta_1, \beta_2, \beta_3$  = Slope coefficients

$\mu .$  = Disturbance term assumed to be purely random

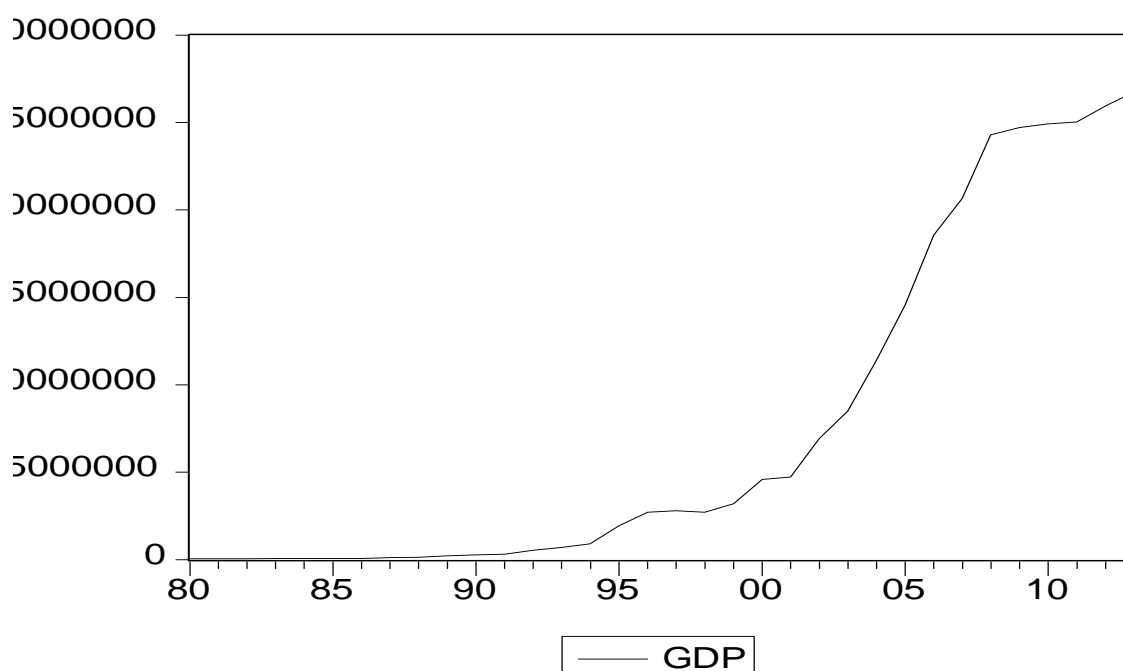
On a priori expectation=  $\beta_0 > 0, \beta_1 > 0, \beta_2 > 0, \beta_3 > 0$

The model above relates economic growth proxy by gross domestic product (GDP) to money market operations. The operations in the money market were captured by three variables- Value of Treasury bills (TBL), Value of Bankers acceptance (BAC), and Value of Commercial papers (COM). The use of GDP as dependent variable is to examine the macroeconomic impacts of money market operations.

#### IV. EMPIRICAL RESULTS, INTERPRETATION AND ANALYSIS

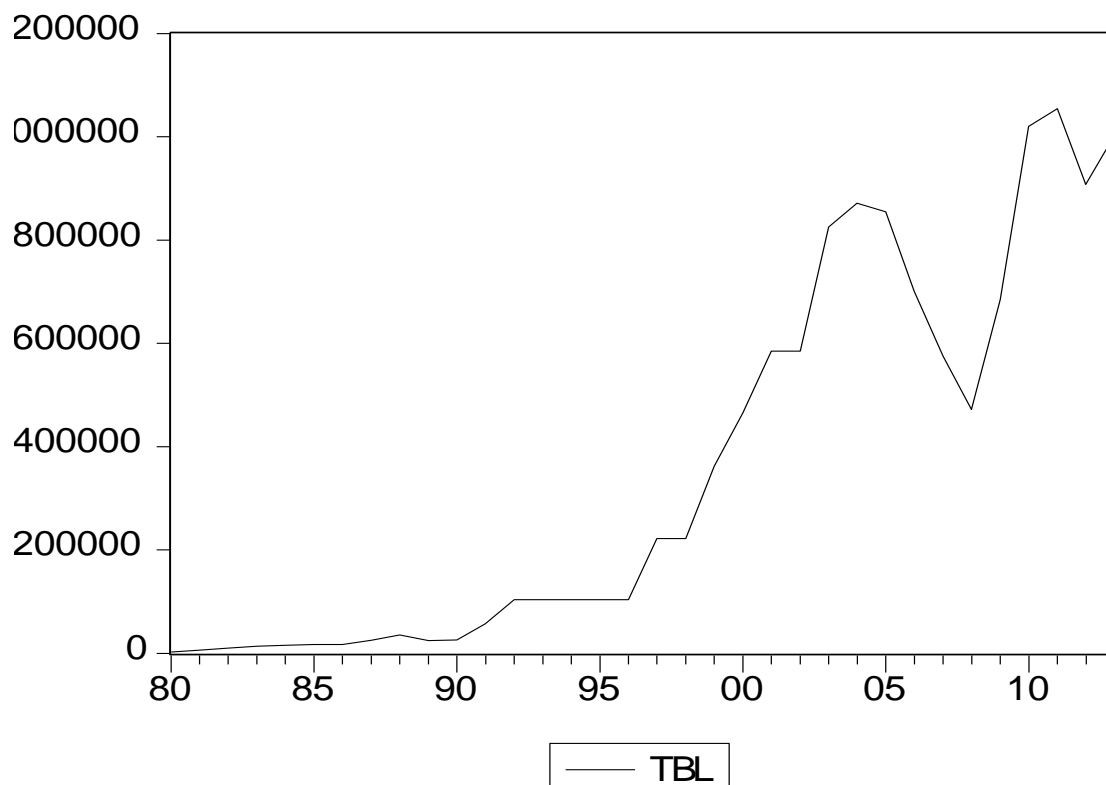
##### A. GRAPHICAL ANALYSIS OF DATA

*Figure 1*



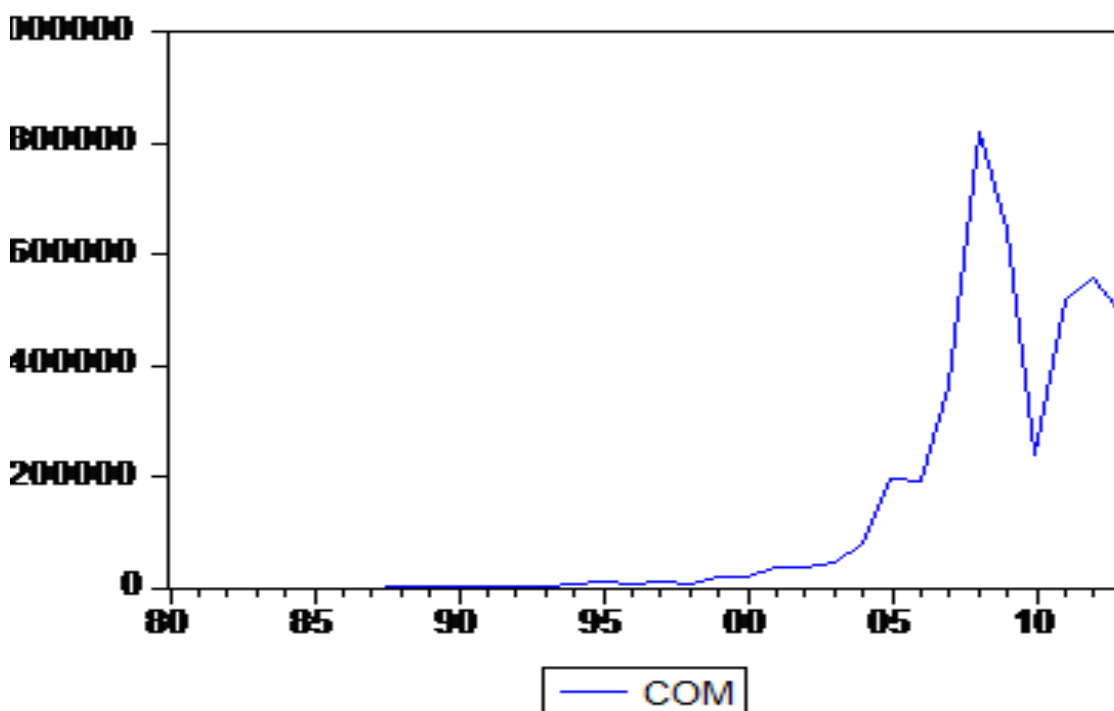
The values of Gross domestic product maintained an increasing trend during the period chosen for this study. In the year 1980, **GDP** was 49632.32 million and it rose to 267549.99 million in the year 1990. It further increased from 4582127.99 million to 24922614 million between the year 2000 and 2010. It later stood at 26743491 million in 2013.

*Figure 2*



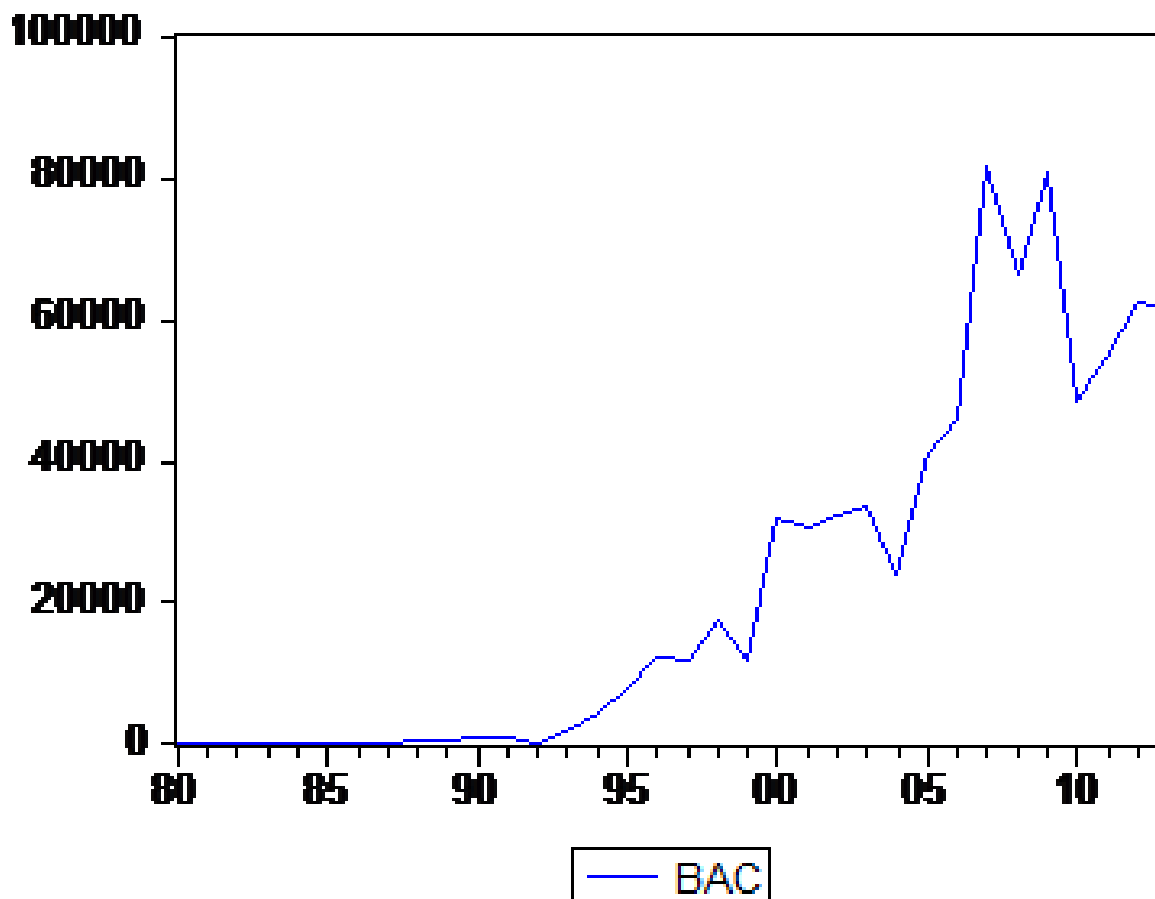
The values of Treasury bills outstanding maintained an irregular trend throughout the period of this study. In the year 1980, **TBL** was 2119 million, and it rose to 25476 million in year 1990. It further increased to 825054.5 million in year 2003; it later declined to 471929.5 million in year 2008. It then stood at 1003257.6 million in year 2013.

*Figure 3*



The values of Commercial paper outstanding had an irregular trend during the period chosen for study. In the year 1980, *COM* was 48.1 million; it then rose to 10034.9 million in year 1995 but later declined to 7252.2 million in year 1998. It further stood at 822700.9 million and 489350.37 million between the year 2008 and 2013 respectively.

*Figure 4*



The values of Bankers acceptance outstanding had an irregular trend during the period chosen for analysis. In the year 1980, *BAC* was 28.3 million and it rose to 953.4 million in year 1990. It further increased to 31774.9 million in year 2000 but later declined to 24002.9 million in year 2004 and then stood at 61516.69 million in 2013.

**B. DESCRIPTIVE STATISTICS RESULT**

*Table 1*

	<i>GDP</i>	<i>TBL</i>	<i>BAC</i>	<i>COM</i>
<b>Mean</b>	7601521.	358063.8	22565.30	126972.1
<b>Median</b>	2705575.	162563.5	11964.10	9029.300
<b>Maximum</b>	26743491	1054285.	81834.00	822700.9
<b>Minimum</b>	47619.66	2119.000	8.600000	48.10000
<b>Std. Dev.</b>	9828110.	369231.4	26198.20	222829.9
<b>Skewness</b>	0.991349	0.600300	0.888995	1.769952
<b>Kurtosis</b>	2.298384	1.816562	2.511513	4.929908

<b>Jarque-Bera</b>	6.266426	4.026116	4.816484	23.02858
<b>Probability</b>	0.043578	0.133580	0.089973	0.000010
<b>Observations</b>	34	34	34	34

*Result extracted from the Eviews 7 output.*

An examination of the result above shows the mean values of the **GDP, TBL, BAC, and COM** variables are 760152.1, 358063.8, 22565.30 and 126972.1 respectively. The median of the series are 2705575, 162563.5, 11964.10 and 9029.300 respectively for **GDP, TBL, BAC and COM** variables. It should be noted that the median is a robust measure of the centre of the distribution that is less sensitive to outliers than the mean. The maximum values of each of the series in the current sample are 26743491 for **GDP**, 1054285 for **TBL**, 81834.00 for **BAC** and 822700.9 for **COM** respectively. The standard deviations which are a measure of dispersion spread in each of the series are 9828110 for **GDP**, 369231.4 for **TBL**, 26198.20 for **BAC** and 222829.9 for **COM**. The skewness which is a measure of asymmetry of the distribution of series around its mean, are all positive for the money market operations variables (0.991349 for **GDP**, 0.600300 for **TBL**, 0.888995 for **BAC** and 1.769952 for **COM**), which means that the distribution has a long right tail. The Kurtosis statistic that measures the peakedness or flatness of the distribution of each of the series is calculated at 2.298384 for **GDP**, 1.816562 for **TBL**, 2.511513 for **BAC**, and 4.929908 for **COM**.

The Jarque-Bera statistic, which is a test statistic for testing whether the series is normally distributed, measuring the difference of the skewness and kurtosis of the series with those from the normal distribution is reported at 6.266426 with a probability of 0.04 for **GDP**. It reported for 4.026116 with a probability of 0.13 for **TBL**, 4.816484 with a probability 0.08 for **BAC** and 23.02858 with a probability of 0.00 for **COM**.

### **C. UNIT ROOT TEST**

The study conducted stationarity test using the augmented dickey fuller (ADF) test. The results are presented in levels at appendix. ADF test statistic and 95 percent critical ADF value for each of the money market operations variables is shown above, it indicates that **GDP, TBL, BAC** are stationary in their levels since their respective ADF values are greater than 95 percent critical value while **COM** is stationary at first difference with ADF value greater than it 95 percent critical value. With these result these variables are adjudged to be stationary. This implies the absence of unit roots among the variables. Since the money market operations variables are 1(0), the study conducted VAR estimation instead of Johansen Cointegration procedure.

### **D. VECTOR AUTOREGRESSION ESTIMATION**

*Global Statistics showing Relationship between GDP, TBL, BAC & COM derived from VAR Estimation. Table 2*

R-squared	0.994432
Adj. R-squared	0.993361
Sum sq. Resids	1.71E+13
S.E. equation	810345.5
F-statistic	928.7096
Log likelihood	-477.4507 30.21567



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Akaike AIC	
Schwarz SC	30.49050
Mean dependent	8073577.
S.D. dependent	9945504.

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*Result retrieved from Eviews output*

Table 2 above depicts the global statistics. The observed degree of relationship between the variables was quite high at an adjusted R-squared of 0.99. By implication, about 99% of the variations in **GDP** were explained by the model. This demonstrates a good fit as indicated by the F-statistic of 928.7096, which is significant at 1% level. The log-likelihood ratio, Akaike information criterion and Schwarz Bayesian criterion statistic all showed that the model has good forecasting power.

**Relative Statistics showing Relationship between GDP, TBL, BAC and COM derived from VAR Estimation.**

*Standard Errors & t-statistics in Parentheses*

**Table 4.**

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	GDP
GDP(-1)	1.416409 (0.24299) [ 5.82910]
GDP(-2)	-0.582245 (0.21176) [-2.74958]
C	24351.57 (217811.) [ 0.11180]
TBL	3.008607 (1.00183) [ 3.00310]
BAC	-8.726485 (22.5727) [-0.38659]
COM	4.481971 (2.01772) [ 2.22131]

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*Result retrieved from Eviews output*

Test Result: from the table, the money market operations variables are value of Treasury bill outstanding (**TBL**), value of banker acceptance outstanding (**BAC**) and value of commercial paper outstanding (**COM**). The **TBL and COM** recorded a coefficient of 3.008607 and 4.481971, a standard error of 1.00183 and 2.01772, thus a t-statistic of 3.00 and 2.22

respectively. This is significant at 5% level of significance. Thus, the **TBL and COM** variables were positively and significantly related to **GDP** over the period of this study. The hypothesis of no significant short run relationship cannot be accepted in the alternative hypothesis. The inference is that there exists a positive significant short-run relationship between the Nigeria economic growth and money market variables of **TBL** and **COM**.

#### **E. JOHANSEN COINTEGRATION TEST RESULTS**

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.914003	132.1948	47.21	54.46	None **
0.607626	53.68446	29.68	35.65	At most 1 **
0.502030	23.74717	15.41	20.04	At most 2 **
0.043892	1.436297	3.76	6.65	At most 3

The Johansen and Jusellius test for cointegration between economic performances measured by the **GDP** and the money market operations variables. The critical assumption was that of linear deterministic trend in the data series, namely **GDP TBL BAC COM**. It can be seen that the economic performance variable (**GDP**) is cointegrated with the value of the treasury bills, banker's acceptance and commerciapapers at 1% significance level. This indicates that a long-run equilibrium relationship exists between them. Thus the hypothesis of no cointegration cannot be accepted.

#### **F. GRANGER CAUSALITY TEST RESULT**

Null Hypothesis:	Obs	F-Statistic	Probability
TBL does not Granger Cause GDP	33	18.0830	0.00019
GDP does not Granger Cause TBL		1.31350	0.26082
BAC does not Granger Cause GDP	33	5.28522	0.02865
GDP does not Granger Cause BAC		8.86338	0.00571
COM does not Granger Cause GDP	33	7.28458	0.01131
GDP does not Granger Cause COM		21.7524	6.0E-05
BAC does not Granger Cause TBL	33	4.79228	0.03650
TBL does not Granger Cause BAC		6.58468	0.01552
COM does not Granger Cause TBL	33	4.00278	0.05455
TBL does not Granger Cause COM		6.26404	0.01800
COM does not Granger Cause BAC	33	0.11353	0.73851
BAC does not Granger Cause COM		11.3338	0.00210

The result of the Granger causality test shows that a relationship (although unidirectional) exists between money market variables and economic growth in Nigeria. It can be seen that causality runs from economic growth to money market operation growth and not the other way round. In Nigeria growth in economic activities generally leads to higher income levels which are partly used for buying money market securities or instruments. This findings support the long-standing and highly celebrated results and argument by Shaw (1973) and Levine (1997) that the impact of economic development on financial market development is stronger than the reverse effect.

## **V. CONCLUSION**

This study examined the nexus between money market operations and economic growth in Nigeria. Using data covering the period of thirty three (33) years, a dynamic framework was devised for the study in order to identify both the short term and long term nexus of money market operations on economic performances. Analyses of data were conducted in two parts. The first was descriptive statistical analysis of the concerned, Graphical analyses were also done using line graphs. The second part of the analysis involved more sophisticated econometric modelling and estimation. These were made of the Vector Autoregression (VAR) modelling and estimation. The study also utilised the Granger –causality technique and the Johansen cointegration procedure. Analyses of the estimated results of the models were done in two parts:

Global statistical analysis to determine the general utility of the models constructed and relative effects of the explanatory variables. These enabled the researcher to test the hypotheses with the findings that there existed a positive and significant short run relationship between money market variables and the Nigeria economic growth over the period of this study. This collaborate the findings of ( Ikpefan and Osabuohien 2012 and King and Levine 1993). There existed a positive and significant long-run relationship between money market variables and Nigeria economic growth. This means that money market operations have strong connection on the level of economic activities in Nigeria. As these operations improve, the economy also tends to improve by the same proportions. This result is in line with the findings by King and Levine (1993) for other developed economies. The results obtained also shows that it is economic growth that granger causes the money market operations in Nigeria and not the other way round. The Granger causality test result shows that better economic performance tends to stimulate the money market operations. Investors' activities in the market are heightened during periods of high income growth in Nigeria. Based on the findings of this study the following recommendation are offered. Firstly the government should put in place appropriate and sound macroeconomic policies to boost the development of the money market with a view to promoting productive activities and investments. Secondly, the functioning of existing money market should be strengthened. This may be achieved by improvement in the dissemination of information in the market. Finally, the need to further reform the money market to complement the recent banking sector reforms with a view to reposing some confidence in prospective investors and entrepreneurs. As such this conclude that money market operations delivers short term growth tendencies and can help to ensure long run impressive and steady growth rates in Nigeria as it is a key component of the financial system a fulcrum of monetary operations conducted by the central bank in its pursuit of monetary policy objectives.

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