

## Relationship Between Money Market And Economic Growth In Nigeria

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### Abstract

*This paper investigated the relationship between money market and economic growth in Nigeria. Secondary data for 38 years covering the period of 1981 to 2018 was used. Econometric methods of analysis of Lag Length Selection Criteria, ARDL Bound Test for Cointegration, Long Run and Short Run Estimations and Diagnostics Tests of Serial Correlation, Heteroskedasticity, Cusum Test and Ramsey Reset Test were carried out. The result found that there is long run relationship between money market and economic growth, as indicated by the F-statistics 4.48 which is higher than the upper bound values at all level of significance. This suggests that there exists a long run relation between money market and economic growth. The results of the error correction suggest the validity of long-run relationship between money market and economic growth. The study recommends that financial market regulatory body to increase the size of the money market through policy relaxation in order to achieve economic growth in the country.*

**Keywords:** Money Market, Economic Growth, Bound Test.

**JEL Classification:** C01, E05, G10

### Introduction

Money market provides means for liquidity and a way of raising short-term funds for lubricating economic activities in any nation. Central Bank Nigeria (2007), maintain that the money market exists as a means of liquidity adjustment in the country. In other words, the money market provides a mechanism for short-term funds of less than one year. The importance of this market in any modern economy is enormous. The money market allows the households, firms and even government the opportunity to raise funds from the savings of surplus economic units. Andrew and Deborah (2015) discover that the money market operations made significant contributions to gross domestic product. In

addition, the results from Pearson correlation coefficient matrix substantially attest to strong linear relationship between the gross domestic product and Treasury bills, Treasury Certificate, Certificate of Deposit, Commercial Papers and Banker Acceptances as explanatory variables. Also emphasized by Anochie, Ude and Chukwu (2015), the Nigerian money market is an indication of a strong national investment for economic development of the Nigerian economy, having provided a platform for business expansion, privatization programme and self-employment. It has also helped investors provide fund for the development of projects which have turned around the

economic fortune of the people and the Nigerian economy.

Although, the Nigerian money market is confronted with challenges as narrated in the study by Anochie, et al (2015), many factors were identified to be responsible for the disorderly development of the Nigerian money market which includes: government mismanagement of fund, high interest rate, exchange rate and devaluation of the naira, inflation, to mention but a few. Uche (2013) noted that some of the problem of the Nigerian money market is the increase in the number of

financial institutions also witnessed an upsurge of crimes perpetrated by individuals and financial institutions. In addition, the high propensity of banks default by many bank debtor has remain one of the problem in Nigeria. This has seriously vitiated risk asset quality of many banks and resulted to the problem of non-performing risk assets of banks. This paper intent to investigate the relationship between money market and economic growth in Nigeria. The rest of the paper is the literature review, methodology, data presentation and interpretation, discussion of finding and conclusion and recommend

### Literature Review

**Table 1: Summary of the Literature Review**

Author(s), Year of Publication and Period of Study	Topic	Methodology	Finding of the Study
Uruakpa (2019) 1990-2017	Impact of Money Market Reforms on Economic Growth of Nigeria 1990 - 2017	Unit Root, OLS, Cointegration and Variance Decomposition	The OLS result suggests that money market value has positive and significant effect on GDP. Treasury bill outstanding has positive but insignificant effect on GDP, treasury bill rate has negative and significant effect on GDP. The value of F-statistics indicate that all the money market proxies jointly impacted on gross domestic product. The variance decomposition revealed that GDP has a declining variance with money market value.
Akarara & Eniekezimene (2018)	Developments in Money Market Operations and Economic Viability in Nigeria: An Empirical Analysis	Autoregressive Distributive Lag (ARDL) Bound Testing	The finding discovered that money market variables have a positive relationship with economic growth rate mutually both in the short and long-run, except for Certificate of Deposit and Commercial paper that has contrary relationship with economic growth in the long-run.
Dingela and Khobai, (2017) 1980 to 2016	Dynamic Impact Of Money Supply On Economic Growth In South Africa: An ARDL Approach	Autoregressive Distributed Lag (ARDL)-Bounds Testing	The findings revealed that there is statistically significant positive relationship between money supply and economic growth both in short run and long run. The government of South Africa should maintain consistency and allow money supply to increase at a steady rate keeping pace with the economic growth.
Lyndon, and Peter (2017) 1989-2014.	Does Money Market Spur Economic Growth In Nigeria? Granger Causality Approach	Unit Root Test, Multiple Regression and Granger Causality Test	The result found strong evidence that TBs, and CPs had positive and significant influence on GDP, while banker's acceptances had positive but insignificant impact on GDP in Nigeria. The granger causality test result revealed no directional causality relationship between treasury bills and GDP. There was also no directional granger causality relationship between commercial papers and GDP, bankers acceptance and GDP.
Ehigiamuose, (2013),	The Link between Money Market and Economic Growth in Nigeria: Vector Error Correction Model Approach	Ordinary Lease Square Method	The evidence from this paper suggested that the Nigerian money market is significant but has a negative relation to economic growth. This suggests that the Nigerian money market does not have enough capacity to produce the needed growth that will push the economy.
Pavtar, (2016), 1985-2014	The Nexus between Money Market Instruments and Nigeria's Economic Growth: A Time Series Analysis	Descriptive Statistics, Ordinary Least Square, Multiple Regression Techniques	The study found that Treasury bill, Treasury certificate, Commercial paper does not have any significant effect on the gross domestic product in Nigeria while Certificate of deposits was found to significantly impact on the gross domestic product of Nigeria..

Source: Author's Compilation

## Methodology

The study adopts quantitative research using annual secondary data for 38 years to assess the relationship between money market and economic growth in Nigeria.

The data were source from the Central Bank Statistical Bulletin, National Bureau for Statistic, capital market annual reports and World Development Index.

**Table 2: Variable Description and Measurement**

Variables	Notations	Definition and Description	Measurement	Apriory Expectations
Dependent variable	<b>LGDP</b>	Log of Real Gross Domestic Product. It measure the	Economic Growth	Positive
(Money Market) Independent variables	<b>LBCPS</b>	Log of Bank Credit to the Private Sector. This is a financial resource provide to the private sector for short term fund. It measure the liquidity in the money market	Liquidity	Positive
	<b>LCMPP</b>	Log of Commercial Papers. This is also a mean through which banks raise money in the banking sector. It also measure how liquid the money market.	Liquidity	Positive
	<b>LCODP</b>	Log of Certificates of Deposit. This mean through which commercial banks raise money. It serves as a means of liquidity in the money market.	Liquidity	Positive

*Source: Author's Compilation*

Econometric techniques of data analysis such as unit root test, ARD cointegration test, autoregressive distributive lag bound test, granger causality test and diagnostic tests of serial correlation, stability tests and heteroskedasticity were used in investigating the relationship of Bank Credit to the Private Sector, Commercial Papers, Certificates of Deposit on economic growth. Annual data on these variables where obtained for the sample period of 1980 to 2018.

Many of the time series data attempted to conduct cointegration and causality using the traditional method of Johansen (1988) and Johansen and Juselius (1990) in testing the long run relation among variables. This

method was considered to be strict because the method required that the series must be integrated of the same order for a long run relationship to be established, if the series are integrated of different order, no test of a long run relationship would be carried out. Pesaran, shin and Smith, (2001) come up with the ARDL bound test which does not require the variable to be of the same order before cointegration or long run relationship could be establish. To ascertain the relationship the computed F-statistics is compare with the critical values, when the F-statistics is greater than the critical values at all level of significance we reject the null hypothesis of no cointegration otherwise we accept the null hypothesis vice versa.

The model is adapted from the same work of Pesaran, Shin and Smith (2001).

The ARDL bound test representation of relationship between the variables in the model is given as:

$$LGDP_t = \gamma_0 + \gamma_1 LGDP_{t-1} + \gamma_2 LBCPS_{t-1} + \gamma_3 LCMPP_{t-1} + \gamma_4 LCODP_{t-1} + \sum_{k=0}^n \alpha_k \Delta LGDP + \sum_{k=0}^n \alpha_k \Delta LBCPS_{t-k} + \sum_{k=0}^n \alpha_k \Delta LCMPP_{t-k} + \sum_{k=0}^n \alpha_k \Delta LCODP_{t-k} + \eta_1 ECM_{t-1} + \varepsilon_t \dots \text{eq. (1)}$$

Apriori in model one the coefficient of the money market variable bank credit to private sector (LBCPS)  $\gamma_2$  is expected to have positive relationship with economic growth, coefficient of commercial paper (CMPP)  $\gamma_3$  is also expected to be positively related with economic growth, coefficient of certificate of deposit (CODP)  $\gamma_4$  is

expected to have a positive sign. The *ECM* is the error correction term which shows the level of convergence of the economy in the long run. This implies that all the money market variables are expected to have a positive relationship with the economic growth.

### Data Presentation and Interpretation

#### Descriptive Statistics

The descriptive statistics show the mean average values for the variables. It shows that all the variables with their lowest and highest values. The skewness indicates the degree of asymmetric of the series and it shows that GDP is normally distributed with a value of 0.655, while other variables are positive skewed, meaning that there are higher values than the sample mean.

value of 12.97 and 3.96 respectively, while GDP and BCPS are negatively distributed with the values of 1.83 and 2.50 respectively. The negative skewness, indicate that there are lower values than the sample mean.

The kurtosis measures the peakness or flatness of the distribution of the series. It shows that a positive distribution for variable such as CMPP and CODP with a

The jaque-bera statistics show that only GDP and BCPS are normally distributed at 5% level of significance as indicated by their p-values, while the other variables are not normally distributed at all level of significance, because their p-values are less 1%, 5% and 10% level of significance.

**Table 1: Descriptive Statistics**

	GDP	BCPS	CMPP	CODP
Std. Dev.	66113.04	7389.751	166.3742	18.44816
Skewness	0.655490	1.093012	3.115336	1.655096
Kurtosis	1.830744	2.504833	12.97602	3.963898
Jarque-Bera	4.885897	7.954497	219.0420	18.82024
Probability	0.086904	0.018737	0.000000	0.000082
Sum	10044008	196599.1	2818.980	382.8900
Sum Sq. Dev.	1.62E+11	2.02E+09	1024174.	12592.38
Observations	38	38	38	38

**Source:** Author's Computation Using E-views 9.0

### Unit Root Test

The results of the ADF and PP tests indicate that all the variables are not stationary at level, except LCODP which proved stationarity at 10% level of significance in both ADF test and PP test. We know this by comparing the absolute value ADF and PP tests with the critical values of the same statistics at 1%, 5% and 10% level of significance. As a result of this, we difference the series once in the case of ADF and PP tests. The variables become stationary after being difference

once. We therefore, conclude that except for LCODP which is stationary at level  $I(0)$ , all other variables (LGDP, LBCPS, LCMMP) are stationary at first difference  $I(1)$ . Therefore, the variables are integrated of mixed other  $I(0)$  and  $I(1)$ .

The test for co-integration and ARDL bound test for cointegration is therefore needed and is carried out in the next section 4.4, but before that lag length selection is conducted and analysed in section 4.3.

**Table 2: Unit Root Test**

Variable	t-stat. and significance	ADF			PP			Order	Decision
		Trend and Intercept values		P-value	Trend and Intercept values		P-value		
		Level	1st Difference		Level	1st Difference			
LGDP	t-stat	-1.510513	-3.742117	Level	-3.172380	-3.742117	Level	I(1)**	Stationary
	1%	-4.243644	-4.234972	0.8067	-4.226815	-4.234972	0.1056		
	5%	-3.544284	-3.540328	1st Diff	-3.536601	-3.540328	1st Diff		
	10%	-3.204699	-3.202445	0.0321	-3.200320	-3.202445	0.0321		
LBCPS	t-stat	-1.756362	-3.840671	Level	-1.32386	-3.849934	Level	I(1)*	Stationary
	1%	-2.630762	-3.626742	0.9789	-3.621023	-3.626784	0.6926		
	5%	-1.950394	-2.945842	1st Diff	-2.943427	-2.945842	1st Diff		
	10%	-1.611202	-2.611531	0.0058	-2.610263	-2.611531	0.0056		
LCMPP	t-stat	-1.454807	-7.667377	Level	-1.348679	-7.541547	Level	I(1)*	Stationary
	1%	-4.226815	-3.626784	0.8270	-4.226815	-3.626784	0.8594		
	5%	-3.536601	-2.945842	1st Diff	-3.536601	-2.945842	1st Diff		
	10%	-3.200320	-2.611531	0.0000	-3.200320	-2.611531	0.0000		
LCODP	t-stat	-3.383634	-3.732449	Level	-3.386761	-6.704234	Level	I(0)**	Stationary
	1%	-4.571559	-4.121990	0.0851	-4.571559	-3.920350	0.0846		
	5%	-3.690814	-3.144920	1st Diff	-3.690814	-3.065585	1st Diff		
	10%	-3.286909	-2.713751	0.0190	-2.286909	-2.673459	0.0001		

Source: Author's Computation Using E-views 9.0

Note: Note: (\*), (\*\*) Suggest Stationarity at 1% and 10%.

### Lag Length Selection

The optimal lag was selected using the traditional selection criteria (LR, FRE, AIC, SC, HQ) obtained from the empirical vector correction estimate. All the lag length

section criteria of LR, FRE and AIC indicated an optimal lag of 2, Lags 2 is the optimal lag that free the residual from serial autocorrelation. Therefore, we select lag two as the optimal lag length.

**Table 3: Lag Length selection Criteria**

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-438.6351	NA	4.76e+09	25.12201	25.16645	25.13735
1	-369.9630	129.4961	99659875	21.25503	21.34390	21.28571
2	-365.4650	8.224806*	81628450*	21.05514*	21.18846*	21.10116*
3	-364.7586	1.251286	83057903	21.07192	21.24968	21.13328

Note: \* indicates lag order selected of the information criterion, (each test at 5% level).

Source: Author's Computation Using E-views 9.0

### Autoregressive Distributed Lag (ARDL) Bound Test for Cointegration

The ARDL bound test for cointegration in table 6 show that when gross domestic product (GDP) is a dependent variable, the calculated F statistics is found to be higher at all level of significance at 1%, 5% and 10%, indicating that the critical value of 4.48 is higher than the upper bound values at all level of significance. This suggests that there exist a long run cointegration/relation between gross domestic product and bank credit to

private sector (BCPS), commercial paper (CMPP), certificate of deposit (CODP), Bankers' Acceptances (BKAC), Treasury Bills (TBILL). It can be concluded that there is long run relation between economic growth and money market in Nigeria. Based on the existence of cointegration or the long run relationship in the model, we therefore estimate the error correction term (ECT) long to know the speed of adjustment of the long run to equilibrium, this carried out in section 4.5.

**Table 4: ARDL Bound Test for Cointegration**

Models	Variables	F-Statistics	Decision
1	LGDP=F(LBCPS, LCMPP, LCODP)	4.48	Co-integration
	<b>Critical Value</b>	<b>Lower Bound</b>	<b>Upper Bound</b>
	1%	3.06	4.15
	5%	2.39	3.38
	10%	2.08	3.00

Source: Author's Computation Using E-views 9.0

### ARDL Cointegration and Long Run Estimation

Autoregressive Distributed Lag Model (ARDL) model is a combination of both the short run and the long run. The difference

coefficients present the short run presentation while the ECM represents the long run representation. Since the ARDL

bound test suggested a long run relationship between the money market variables and economic growth what is important is to estimate the ECM to know the level of convergence or the speed of adjustment.

The results of the ARDL error correction model (ECM) estimation shows that the parameter estimates are appropriately signed and inconformity with the apriori expectations. The estimated coefficient of the error correction term -0.662520 is

significantly different from zero at 5 percent level and with the appropriate negative sign. This suggests the validity of long- run equilibrium relationship among the variables. The estimated coefficient value suggests that the reversion to long run equilibrium is at 66.25 percent speed of adjustment in a year at 5% significance level, which can be considered as high speed of adjustment for the economy, indicating that the system is getting to the long run equilibrium at the speed of 66.25 percent.

**Table 5: ARDL Cointegration and Long Run Estimation**

Regressors	Coefficients	Std Error	t-Stat	P-Values
GDP	0.228117	0.083065	2.746249	0.0252
BCPS	0.228117	0.083065	2.746249	0.0252
CMPP	-0.021555	0.010498	-2.053316	0.0741
CODP	0.003498	0.013109	0.266842	0.7963
ECM(-1)	-0.662520	0.131440	5.040407	0.0410
	R-Squared 0.993720	Prob(F-Stat) 0.000001	DW Stat 2.587355	
	Adjusted R-Square 0.977234		F-Stat 60.27672	

*Source: Author's Computation Using E-views 9.0*

### Autoregressive Distributed Lag (ARDL) short Run Estimation

The coefficient Autoregressive Distributed Lag (ARDL) indicates the strength of relation between the money market indicators and economic growth. From the ARDL in table 6 it is shown that the 1% increase LBCPS increases LGDP by 0.11% and the coefficient is positive but is also insignificant at 5% level of significance since the p-value is more than 5%. The coefficient of CMPP is positive but insignificance at 5% level as indicated by

the p-value of 70.82% which is above the significance level. It indicates that a 1% increase in CMPP increases LGDP by 0.010%. The coefficient of CODP show that 1% increase CODP increases LGDP by 0.012%, but the coefficient is insignificant at 5% level since the p-value of 72.52 is above the 5% level of significance

The model indicates R<sup>2</sup> that the capital variables have explain the economic



growth by 99% of and adjusted R<sup>2</sup> of 97% also shows that. The F-statistics also explains that the joint effect of the money market variables is significant as indicated by the p-values of less than 5% level of significance, which is significant at 1%, DW statistics that there is no autocorrelation. Therefore, the model is fit and the independent variable well fit the model.

The result implies that there is absence of short run relationship between money market and economic growth. That is to say, short term securities offered in the market to raise funds/capital are not effective in increasing investment in the economy. Therefore, their contribution to economic growth is not effective in the short run.

**Table 6: ARDL Short Run Estimation**

Regressors	Coefficients	Std Error	t-Stat	P-Values
C	-0.748671	3.371932	-0.222030	0.0658
GDP	0.364158	0.460015	0.791622	0.4514
BCPS	0.113087	0.168430	0.671419	0.5209
CMPP	0.008861	0.022840	0.387944	0.7082
CODP	0.012243	0.033612	0.364239	0.7251
	<b>R-Squared Adjusted 0.993720</b>	<b>Prob(F-Stat) 0.000001</b>	<b>DW Statistics 2.587355</b>	
	<b>R-Square 0.977234</b>		<b>F-Statistics 60.27672</b>	

**Source:** Author's Computation Using E-views 9.0

### Diagnostic Tests

The result of the serial correlation and Heteroskedasticity Test in the table 9, show that there is no serial correlation given the that the F- statistics is above the 0.5 level of significance, therefore the model is fit and there is no serial correlation. The same for Heteroskedasticity test which suggest that the null hypothesis of no Heteroskedasticity is accepted at 5% level of significance, since the p-value is more

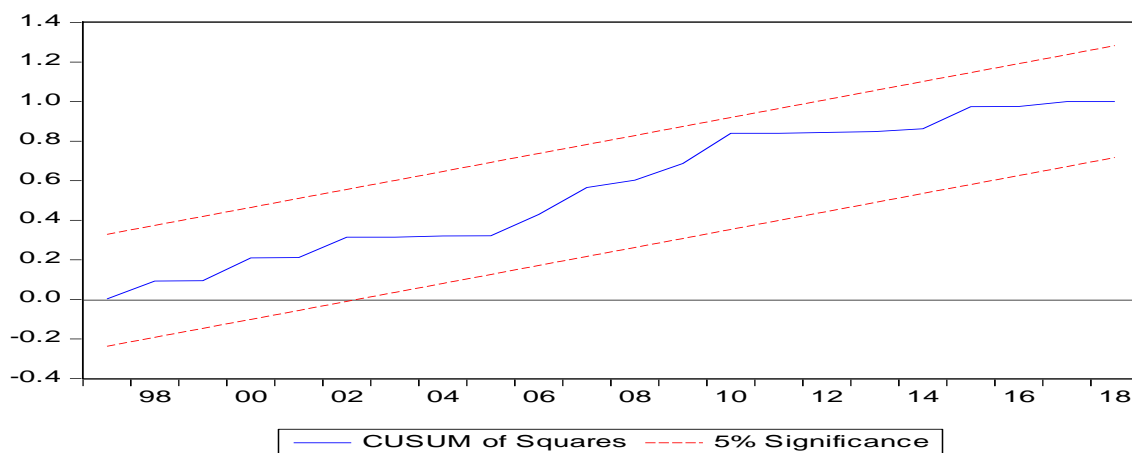
than 5%. Also the Ramsey rest test indicated that we cannot reject the null hypothesis of no sign of misspecification, because the p-value is more than 5% level of significance. Therefore, we conclude that the model is correctly specified and that the model has no sign of non-linearity. All the diagnostics tests confirm that the model is fit and there is no sign of any problem in the model.

**Table 7: Diagnostic Test Results**

Test	F-Statistics	Prob. F	Obs*R-squared	Prob. Chi-Square(2)
Serial Correlation Test	0.460199	0.6377	1.583830	0.4530
Heteroskedasticity Test	0.218229	0.9966	4.112061	0.9899
	<b>F-statistics</b>		<b>t-statistics</b>	
Ramsey RESET Test	<b>Value</b>	<b>Prob.</b>	<b>Value</b>	<b>Prob.</b>
	0.428259	0.5799	0.654415	0.5199

*Source: Author's Computation Using E-views 9.0*

**Figure 1: Cusum Test of Square Test for Stability**



*Source: Author's Generated Using E-views 9.0*

### Findings and Discussions

The result found that there long run relationship between money market and economic growth. Consequently, the long run long run relationship is indicated by the F-statistics of the bound test for cointegration, which shows that it is greater than the upper bound values. Furthermore, the estimated coefficient of the error correction term indicates that it takes 66% for the long run effect to take place in the economy each year. However, no short run relationship was found between money market and economic growth, as indicated by the coefficient of the variables. The diagnostic test of serial correlation, stability test, hetroskedascity

test and Ramsey Reset test indicate that the model is good and can be consider for policy analysis because it does not present any error in the model. This finding is not in line with the finding of Ehigiamuose (2016) and Pavtar (2016), which found a negative relation between money market and economic growth. However, it aligned with the studies Dingela and khoboi (2017), Lyndon and Peter (2017), Andrew and Deborah (2015), Anochie, Ude and Chukwu (2015) and Ehigiamuose (2013) who found a long run relationship between the money market variables and economic growth. We therefore, reject the null hypothesis that there is no long run relationship between

money market and economic growth in Nigeria and accept the alternative hypothesis that there is relationship

### Conclusion and Recommendation

In conclusion, the findings in the study confirm that money market have long run relationship with economic growth in Nigeria. The long run relation at the high speed of 66%, which is consider to create faster economic growth in the country. It also discovered that the money market variables have positive insignificant relationship with economic growth. This finding show how crucial money market activities is to economic growth of the

between money market and economic growth in Nigeria.

country in the long run, thereby, it become imperative for the country to improve the development of the money market variable that can lead to more economic growth in the country. Therefore, this study recommend that the money market authority should provide policies that will improve the money market operation and be quick in checking the activities that will hamper the proper operation of the market so as to contribute in achieving economic growth in the country.

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