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MONEY SUPPLY AND INFLATION RATE IN NIGERIA: THE MISSING LINK

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ABSTRACT

Conventionally and theoretically increase in money supply according to the quantity theory of money triggers a high inflation rate in developed and emerging economies. The reality in Nigeria contravenes the quantity theory of money. This study investigates the missing link in Nigeria from January 2010 to December 2018 by applying the Johansen co-integration, Granger causality tests and Vector Error Correction Model (VECM) on the monthly data. The findings indicated that money supply does not cause inflation. Inflation is caused by non-monetary factors of political instability, corruption, poor basic infrastructure among others. Money supply and inflation co-integrate in the long-term. The causality test proposed a uni-directional flow from inflation to the money supply. Bi-directional causality was not observed in this study. The VECM result indicated that disequilibrium caused in the previous year can converge back to equilibrium in the current year. The general findings of the study disagreed with the quantity theory of money. The study recommends that non-monetary factors of political instability, corruption, poor basic infrastructure among others were responsible for the missing link. These factors should be checked and put in perspective to achieve low inflation at a single digit in Nigeria.

Contribution/Originality: This study contributes to the extant literature by using monthly M3 and M2 money supply data, and the implicit price deflator to GDP to measure inflation, the GDP and monetary policy rate. This study investigates the missing link between money supply and inflation rate in Nigeria by using the data from January 2010 to December 2018. The above serves as a hug contribution which most studies used M2 money supply and annualized time-series data.

1. INTRODUCTION

Prior to the 2008-2010 global economic and financial crises and the 2015-2017 recession in Nigeria, the Nigerian economy consistently and progressively encountered severe decades of economic and financial shock arising from the macroeconomic instability of price, money supply, non-availability and accessibility of credit among others diminishing and distorting economic growth and development in Nigeria.

Nair *et al.* (2018); Amiri and Talbi (2014); Kaouther and Besma (2014) reported that economic and financial shock arising from inflation, price and money supply instability, non-availability and accessibility of credit for

investment were traceable to the surplus supply of money (M1, and M2) and surplus credits to private sectors. Demand-pull and cost-push inflation were end products of extreme cumulative demand pressure on production cost.

Structural inflation, especially in a mono-culture economy alike Nigeria, was traceable to the unproductive production system, lack of product value chain effect, and higgledy-piggledy circulation of products and services as a result of government policy (Nair *et al*., 2018).

Structural inflation directly impacts on the quality of life and living standard of the populace through government policy decreasing the supply while the demand for essential goods and services remains constant.

In the bid to prevent price and money supply instability in Nigeria and achieve money supply, credit availability, and price stability at a 2 percent inflation rate target, the monetary and fiscal policy structures were implemented (Udoh *et al*., 2018). Korkmaz (2018) argued that tight monetary policy frameworks geared towards achieving key economic objectives may trigger an economic recession by decreasing the aggregate demand for goods and services. Thus, various economic policy frameworks implemented by the monetary authorities in Nigeria such as a reduction in consumption demand via an interest rate increase to prevent inflation from the demand-side, or a decrease in the interest rate to prevent inflation from costs have failed to yield positive and significant results in Nigeria.

Inflation rate increased from a single digit in the 1970s to double-digits in 1990s at 63.6% and 72.8%, and the inflationary pressure on the inflation rate increased from 12.9%, in 2000 to 14% in 2001. While the headline inflation rate stayed at double digits between 15%, and 17.9% in 2002 and 2005 respectively.

The economy experienced relative stability after the 2005 economic and financial reforms translating to the merger and acquisition of banks in Nigeria. The inflation rate decelerated melodramatically to 8.24% and 5.38% in 2006 and 2007. In 2008 it increased geometrically to 11.60% and 12.00% in 2009 (Gbadebo and Mohammed, 2015).

Marginal drop in inflation occurred at 11.8% in 2010, 12.3% in 2013 and 8.1% in 2014. In 2015 it increased by 9.1% to by 15.7% in 2016 and 18.3% in the first quarters of 2017 accounting for about 100% increase in prices products and services in Nigeria (FSDH, 2016 as cited in Ditimi *et al*. (2017). During the 2015-2017 era of economic recession.

The money supply comprises of banknotes, and coins, outside the central bank circulating within a period of time. M0, M1, M2, and M3 measures currency and liquid instrument held in different types and sizes of account in operation within Nigeria. According to Ditimi *et al*. (2017) a unit growth rate in money supply increases money spread in an economy exceeding the demand for money and is defined as a direct monetary transmission mechanism (Ragan, 2014 as cited in Ditimi *et al*. (2017).

According to the Quantity Theory of Money inflation is triggered by the volume of money supply in an economy. It can be inferred that the increase in the volume of money supply creates credits for investment, consumption, and production to stimulate economic growth (Bello and Saulawa, 2013).

The reality in Nigeria contravenes the Quantity Theory of Money. Inflation is not a function of the money supply. In Nigeria, inflation rate is on a double digit while the rate of money supply (M2) percentage of GDP and credit to private sector percentage of GDP in the last 10 years is still on constant fluctuation as presented in Figure 1. The constant inflation rate, money supply and credit to private sector fluctuation instigate economic, social and political retardation in Nigeria and was also contributing factors to the 2015-2017 economic recession in Nigeria eroding the purchasing power of money, and the value of savings and investments in Nigeria.

The negative impact of inflation in Nigeria and the missing link triggered worry and inquiries giving birth to the question "Is money supply the cause of the high rate of inflation in Nigeria"? Or other non-monetary factors?

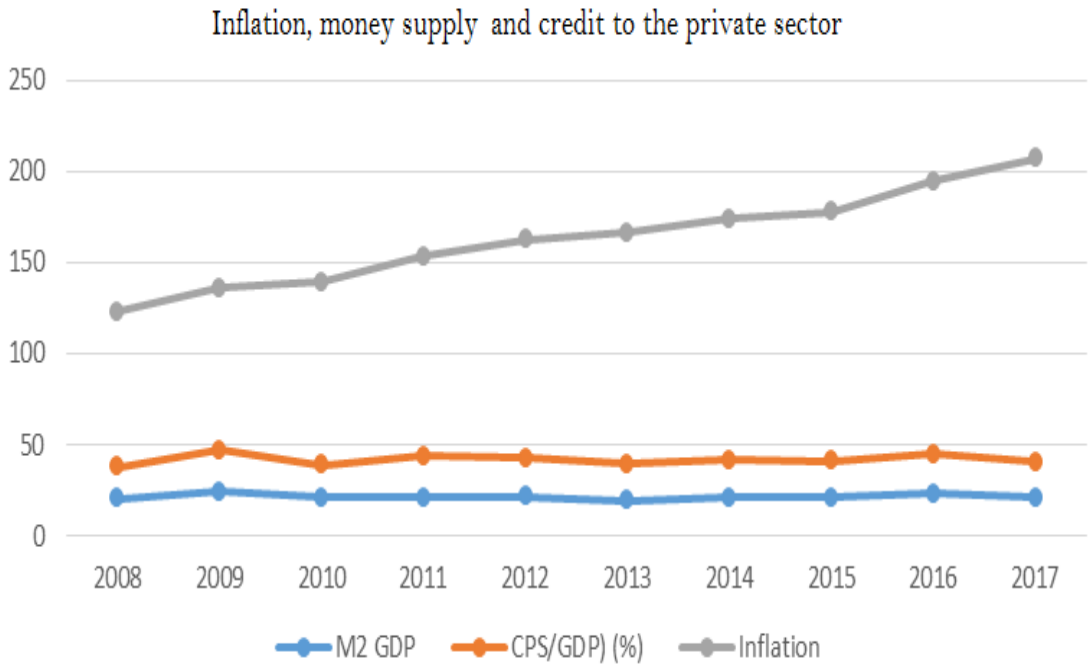

Figure-1. Inflation, money supply and credit to the private sector a percentage of economic growth.

2. REVIEW OF LITERATURE

In the bid to empirically investigate whether or not money supply ganger causes high inflation in Nigeria. There is a need to address and proffer answers to a question posed by the Federal Reserve Bank of San Francisco (FRB, 2002 as cited in Ditimi *et al.* (2017) "on factors responsible or contributing to high rate of inflation in a nation?" Pinto (1990) as cited in Ditimi *et al.* (2017) observed that currency devaluation arising from the merger of official and parallel exchange rate diminishes export revenue and ganger causes inflation (Amassoma *et al.*, 2018).

The findings of Pinto (1990) as cited in Ditimi *et al.* (2017) was substantiated in the studies of Egwaikhide *et al.* (1994); Imimole and Enoma (2011); Kaouther and Besma (2014) and Kamal (2016). The scholars underscored that currency devaluation could plausibly lead to a swift increase in the overall price level of consumer's products via a unit increase in the production and service cost in the short-term.

Similarly, Fullerton (1993) observed that the late 1980s and 1990s currency devaluation in Nigeria, instigated other high inflation rate regimes and that inflation was induced by monetary factor without any reparations.

Bawa *et al.* (2016) observed that inflation exhibited a strong degree of apathy in Nigeria. The finding of Bawa *et al.* (2016) was buttressed in the findings of Odusanya and Atanda (2010) that GDP growth rate and inflation apathy were significant factors in explaining the inflationary process in Nigeria.

Metwally and Al- Sowaid (2004) in Egypt reported that demand-pull and cost-push were the major and core determinants of inflation. Variation in money aggregates, fiscal deficit, external sector disequilibrium, oil prices shocks, and currency devaluation spurs inflationary pressure in Nigeria and other nations. Findings from previous studies validated the submission of the monetarists' theorem (Bozkurt, 2014).

2.1. Empirical Framework

Table-1. Empirical framework.

Author	Scope	Objective	Methodology	Findings
Amassoma *et al.* (2018)	Nigeria	Examine the money supply to inflation from 1970 to 2016	Co-integration and ECM approach	Lack of causality between money supply and inflation and vice versa. The lack of causality is traceable to the 2015-2017 recessions.
Adodo *et al.* (2018)	Nigeria	Effectiveness of monetary policy on inflation	Johansen Co-integration and Error Correction Model (ECM)	Money Supply and Interest Rate significantly explained the variation in Inflation Rate. While the exchange rate is insignificant.
Murshed *et al.* (2018)	Bangladesh	Examine the money supply on inflation from 1980 to 2014	Granger causality and VECM approach	Unidirectional causality between budget deficit and inflation.
Nair *et al.* (2018)	Bangladesh	Investigate the money supply on inflation rate monthly from 2010.05-2017.12	Co-integration and approach VECM	The money supply does not affect the inflation in short-term. There is a bi-directional causality in the long-term.
Sasongko and Huruta (2018)	Indonesia	Examine money supply on price level using monthly data from 2007.01-2017.07	Granger causality model	There is a uni-directional causality between money supply and price level.
Diermeier and Goecke (2016)	Euro Zone, countries	Investigate the money supply on inflation	Granger causality and correlation analysis in the VAR approach	No causality between monetary aggregates and inflation. While there is causality between the balance sheet size of the commercial bank and the inflation rate.
Yousfat (2015)	GCC countries	Examine money supply growth and inflation from 1970to 2013	Johansen cointegration	Money supply has a long-term positive nexus on the inflation rate.
Chaudhry *et al.* (2015)	Pakistan	Examine money supply growth and inflation from 1973-2013	ARDL	Interest rate and money impact on inflation rate in the long-term while national output level in the short-term.
Mehrara and Sujoudi (2015)	Iran	Examine monetary variables on energy prices from 1959- 2010	Bayesian econometric approach	A decrease in monetary variables and energy prices control the inflationary pressure in Iran.
Mbongo *et al.* (2014); Sabade (2014)	India	Examine money supply and inflation on the quantity theory of money.	Johansen cointegration and Granger causality	Inflation dynamics vary across developing economies. There is a need for a re-visit.

3. THEORETICAL FRAMEWORK

3.1 Monetarist View

The monetarist's view is expressed as money being a function of demand-pull inflation. The quantity theory of money defines inflation as a monetary event arising from the monetary expansion of the monetary policy rate. There is a link between money supply and price level. Fisher's exchange equation is employed to determine the link between money supply and price level.

Fisher's exchange equation;

$MV = PT$

Where,

M = Currency and other financial instruments in circulation (M0, M1, M2, M3).

V = Velocity of money (measured by the sum of times money exchange hands within the economy).

P = Prevailing Price level.

T = Output level (goods and services produced).

From Fisher's equation, it is inferred that the left-hand side of the equation symbolizes money supply while the right-hand side symbolizes demand for money. Transactions spur the demand for money. In the short-term, 'V' and 'T' are alleged to be constant and exogenously determined. P varies positively and proportionately, with M without affecting T. The rate growth in money supply positively affects the overall price level of consumer products and vice versa. A unit variation in the money supply results to the proportional change in prices.

According to the quantity theory of money to curtail inflation, in Nigeria, the volume of money in circulation must be curtailed to condense inflation in a modest way and vice versa in case of disinflation and deflation.

3.2. Criticism

The critics of the theory differ on the validity of this theory in the short-term, while others in the long-term. In Nigeria, India, and Turkey and other emerging economies the assumption of the theory vis-à-vis the constant state of "V" and "T" doesn't hold. Specifically, in Nigeria due to other prevailing elements prevalent in the country such as political factors, double taxation, poor infrastructure, insecurity and corruption triggers inflation rather than just the money supply. The assumption is that money works in a uni-directional pattern and not in a bi-directional pattern.

A unit increase in the money supply may increase the overall price level, however, a unit decrease in the money supply may not necessarily decrease the over-all price level, a situation that is currently prevalent in Nigeria and India (Sabade, 2014).

3.3. Keynesian View

The Keynesian school of thought differs from the monetarist's view. In the short-term analysis, the Kenynsians argues that an increase in the aggregate demand increases demand-pull inflation. The gap between the aggregate demand and aggregate supply stimulates rapid inflation. The overall price levels are exogenously determined.

3.4. Structuralist View

The Structuralist school of thought explains inflation in developing countries like Nigeria. The Structuralist theory states that the demand-supply gap spurs inflation in an imperfect market with structural imbalances in some segments of the developing economies. As a result, fiscal and monetary actions can't solve this economic difficulty. The Structuralist argument forms the framework of this study to investigate the missing link in Nigeria.

3.5. Empirical Framework

Based on the findings of Mbongo *et al.* (2014) and Sabade (2014) in India and others, this study re-examine the money supply effect on inflation in Nigeria through a long and short-term relationship and directional causality between the variables.

4. METHODOLOGY

This study used monthly time series data from the Central Bank of Nigeria's (CBN) Statistical Bulletin from January 2010 to December 2018 to explore the long and short-term relationship and causal link between money supply and inflation in Nigeria.

4.1. Variables

Implicit Price Deflator to GDP: measured inflation rate and is calculated as the GDP at the current basic prices divided by the GDP at the constant basic prices. The ratio explains and accounts for the change effects of inflation on the overall prices of products and services that make up the GDP.

Money Supply: M2 and M3 were used to investigate the dynamics of inflation. M3 included, M2, M1, M0 and liquid components of money supply that were not in circulation such as repurchase agreement and was the broadest measure of money supply in an economy. M2 consisted of all of M0 and M1 in addition to saving deposits and certificates of deposit.

Monetary Policy Rate (MPR): The minimum rediscounted rate (MRR) served as the CBN interest rate benchmark which anchors all other interest rates in the money market and the economy, influencing the cost of funds and its direction in the economy.

Gross Domestic Product: measures the rate of economic growth.

4.2. Model Formulation

The implicit Price Deflator to GDP was the dependent variable and the M3 and M2 money supply were explanatory variables with MPR and GDP as moderating variables.

4.2.1. The Model Expression

$$IPD_t = f(M3_t, M2_t, MPR_t, GDP_t) \quad (1)$$

$$IPD_t = \beta o + \beta_1 + \beta_2 M3_t, + \beta_3 M2_t, + \beta_4 MPR_t, + \beta_5 GDP_t + \mu \quad (2)$$

To take care of the out layers and for easy interpretation, the monthly datasets were Log transform following the natural log model to provide suitable coefficients of the elasticity for the dependent variable adjacent to explanatory variables. Equation 2 is transformed into:

$$IPD_t = \beta o + \beta_1 + \beta_{2Log} M3_t, + \beta_{3Log} M2_t, + \beta_4 MPR_t, + \beta_{5Log} GDP_t + \mu \quad (3)$$

5. DATA AND RESULT PRESENTATION

5.1. Pre-Test

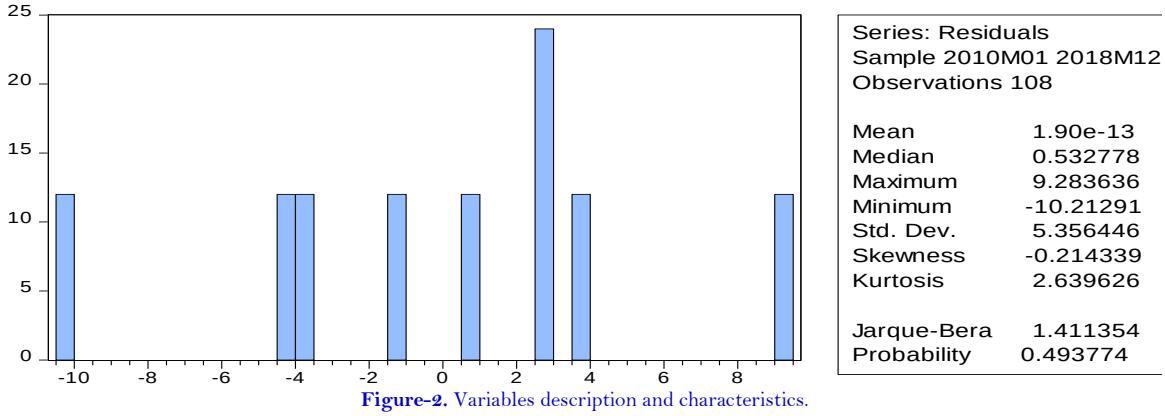

Figure-2. Variables description and characteristics.

Figure 2 describes the aggregated averages of the mean, median and standard deviation, a measure of spread and variation. Skewness measured the symmetry and kurtosis, the peakedness. The results were largely platykurtic and the kurtosis is less < 3. The JB P-value is >5%.

5.2. Unit Root

The stationarity properties of the variables were investigated by the Augmented Dickey-Fuller (ADF) and Phillips and Perron, (PP) unit root tests. The null hypothesis for the ADF and PP tests that the series has a unit root. The model expression;

$$\Delta y_{t-1} = \alpha_0 + \lambda y_{t-1} + \alpha_2{}^t + \sum^p{}_{i=2} \beta j \, \Delta y_{t-1} + \mu_t.$$

Where y is the dependent variable, t is the trend, a is the intercept, μ_t t is white noise and p is the lag level.

Table-2. ADF and PP unit test.

Variables	Test	At levels @ 5%	Inference	Test	1st Difference @ 5%	Inference
LogGDP	ADF	-2.475 (0.339)	Non-Stationary	ADF	-7.078 (0.000)***	Stationary
	PP	-3.984 (0.012)		PP	-14.676 (0.000) ***	
LogM3	ADF	-3.527 (0.045)	Non-Stationary	ADF	-10.765 (0.000) ***	Stationary
	PP	-3.527 (0.041)		PP	-11.356 (0.000) ***	
LogM2	ADF	-3.241 (0.082)	Non-Stationary	ADF	-6.311 (0.000) ***	Stationary
	PP	-4.441 (0.291)		PP	-15.133 (0.000) ***	
Infr	ADF	-1.273 (0.883)	Non-Stationary	ADF	-5.908 (0.0001) ***	Stationary
	PP	-2.795 (0.202)		PP	-14.992 (0.0000) ***	
MPR	ADF	-2.637 (0.264)	Non-Stationary	ADF	-10.373 (0.000) ***	Stationary
	PP	-2.637 (0.264)		PP	10.376 (0.0000) ***	

Note: Values in parenthesis are p-values. The asterisks *** Indicate significance at 5 %.

All the variables in Table 2 showed stationary properties at the first difference I (1). Prior to the estimation of the VECM model, it is vital to determine the lag order, using the VAR lag order selection based on these five criteria; Log-likelihood, Final prediction error (FPE), Akaike Information Criterion (AIC), Schwarz information criterion and Hannan- Quinn information criterion (HQ). The results reported that all the criteria proposed an optimal lag length of one as presented in Table 3.

Table-3. VAR lag order selection criteria.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-41.56316	NA	1.75e-06	0.931263	1.061522	0.983981
1	573.6945	1156.684*	1.30e-11*	-10.87389*	-10.09234*	-10.55758*
2	574.9522	2.238678	2.11e-11	-10.39904	-8.966200	-9.819146
3	576.4548	2.524361	3.40e-11	-9.929095	-7.844959	-9.085608
4	578.2853	2.892288	5.50e-11	-9.465706	-6.730278	-8.358629
5	580.5703	3.381847	8.92e-11	-9.011407	-5.624686	-7.640740
6	583.5130	4.060829	1.45e-10	-8.570260	-4.532246	-6.936003
7	587.4624	5.055208	2.35e-10	-8.149247	-3.459941	-6.251400
8	593.0762	6.624302	3.79e-10	-7.761523	-2.420925	-5.600087

* Indicates lag order selected by the criterion.

5.3. Estimation

5.3.1. Co-Integration Analysis

The Johansen co-integration test was used to investigate the long-term equilibrium relationship among variables with the same stationarity properties. A minimum of (1) co-integrating vector wa required to established co-integration between variables.

$y_t = \mu + A_1 y_{t-1} + \ldots\ldots\ldots + A_p y_{t-p} + \varepsilon_t$ for t =1,……..T

Where:

yt, yt-1,…,yt-p = vectors of level and lagged values of P variables with the same stationarity properties;

$A_1, \ldots, A_p$ = coefficient matrices with (PXP) dimensions;

μ = intercept vector,

ε_t = vector of random errors.

According to Johansen (1988) and Johansen and Juselius (1990) trace statistics are obtained by using the Eigenvalues. The trace statistic (λ trace) is estimated following the;

$\lambda_{trace} = -T \sum Ln\ (1-\lambda i),\ I = r + 1, \ldots\ldots\ n-1$

From the result in Table 4, the assumption of the null hypothesis of "there is no co-integrating vector" in the projected model was rejected at 5% level. Hence, there was (3) co-integrating vector in the model. The results revealed a long-term equilibrium relationship between variables of money supply and inflation in Nigeria. The results were substantiated in the Eigenvalue test results indicating (3) co-integrating equations at 5% level.

Table-4. Co-integration test.

Hypothesized		Trace	0.05	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None*	0.125000	44.00819	69.81889	0.0099
At most 1*	0.118903	30.25446	47.85613	0.0059
At most 2*	0.113140	17.21600	29.79707	0.0041
At most 3	0.040691	4.848992	15.49471	0.8246
At most 4	0.005521	0.570203	3.841466	0.4502
Trace test indicates no cointegration at the 0.05 level, * denotes rejection of the hypothesis at the 0.05 level				
Eigenvalue test				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None*	0.125000	13.75373	33.87687	0.0099
At most 1*	0.118903	13.03846	27.58434	0.0088
At most 2*	0.113140	12.36701	21.13162	0.0059
At most 3	0.040691	4.278788	14.26460	0.8288
At most 4	0.005521	0.570203	3.841466	0.4502

Max-eigenvalue test indicates no cointegration at the 0.05 level, * Denotes rejection of the hypothesis at the 0.05 level

Table-5. Vector error correction model (VECM).

Variables	ECT (Coefficient)	P-Value @ 5%
CointEq1	-0.087	0.0004
LogGDP(-1)		
LogM2(-1)	-1.169	0.0002
LogM3(-1)	-1.654	0.0003
MPR(-1)	-0.038	0.0005
INFR(-1)	-0.003	0.0002

The ECT coefficient measures the swiftness of adjustment from disequilibrium to equilibrium as shown in Table 5. The ECT coefficient stability must be negative and significant. The CointEq1 of -0.087 was negative and significant at 5% level.

The result portrayed that disequilibrium caused by a non-monetary factor in the previous year can converge back to equilibrium at 87% in the current year. There was a long-term causality from inflation to the money supply variables.

5.4. Granger Causality Test

To determine the directional causality between the variables following co-integration analysis, the Pairwise Granger Causality test was carried out. The null hypothesis of the model was "non-causality between variables". If the null hypothesis of the model was rejected that means the independent variable Granger-Causes the dependent variable at a 5% significance level.

The result in Table 6 indicated a uni-directional relationship between inflation and the money supply variables and a bi-directional relationship between the money supply variables and inflation was not observed in this study. Inflation granger-cause M2 and M3 money supply, but the M2 and M3 money supply don't granger cause inflation

at the 5% significance level. Inflation reacts to the volume of money supply translating to a self-sustained rate of inflation in Nigeria. The 'monetarist' view of inflation does not hold in Nigeria.

Table-6. Pairwise granger causality tests.

Null Hypothesis:	Obs	F-Statistic	Prob.
LOGM2 does not Granger Cause INFR	107	0.80384	0.172
INFR does not Granger Cause LOGM2		0.15575	0.0039
LOGM3 does not Granger Cause INFR	107	0.25644	0.2337
INFR does not Granger Cause LOGM3		0.06954	0.0025
LOGGDP does not Granger Cause INFR	107	0.0927	0.7614
INFR does not Granger Cause LOGGDP		0.00092	0.0059
MPR does not Granger Cause INFR	107	0.00511	0.0031
INFR does not Granger Cause MPR		0.86245	0.0552
LOGM3 does not Granger Cause LOGM2	107	0.03209	0.8582
LOGM2 does not Granger Cause LOGM3		1.34405	0.249
LOGGDP does not Granger Cause LOGM2	107	0.19598	0.0089
LOGM2 does not Granger Cause LOGGDP		0.20673	0.6503
MPR does not Granger Cause LOGM2	107	0.00267	0.9589
LOGM2 does not Granger Cause MPR		1.13725	0.0087
LOGGDP does not Granger Cause LOGM3	107	0.85136	0.3583
LOGM3 does not Granger Cause LOGGDP		0.13526	0.0138
MPR does not Granger Cause LOGM3	107	0.42041	0.5182
LOGM3 does not Granger Cause MPR		0.98909	0.3223
MPR does not Granger Cause LOGGDP	107	0.02195	0.8825
LOGGDP does not Granger Cause MPR		0.87588	0.0015

The finding of this study supported the findings of Nair *et al.* (2018); Taslim (1982) and Chowdhury *et al.* (1995) *in* Bangladesh, Fabian and Charles (2014) in Nigeria, Rakić and Rađenović (2013) in Serbia among others. Inflation is not a function of M2 and M3 money supply in Nigeria. The findings of this vary from studies of Adodo *et al.* (2018); Dania (2013); Iya and Aminu (2014) in Nigeria that reported inflation as a function of the money supply. This study opposed the study of Akinbobola (2012) in Nigeria that inflation and money supply had no explanation. The study of Akinbobola (2012) ignored other non-monetary factors in Nigeria which have a ripple effect on the economy.

6. CONCLUSION

The result of the Johansen cointegration test showed a long-term relationship between the money supply variables and inflation. The VECM result showed that disequilibrium caused by a non-monetary factor such as the money supply in the previous year can converge back to equilibrium at 87% in the current year. The directional causality test reported a bi-directional causality between inflation and the M2 and M3 money supply variables. It has been established that monetary factors do not affect the price level through inflation in Nigeria, but that non-monetary factors of political instability, corruption, double taxation, and poor infrastructure development among others does. This study recommends that non-monetary factors should be constrained and put in suitable perspective to achieve a low inflation at single digits at most.

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REFERENCES

Adodo, F.L., O.R. Akindutire and J.K. Ogunyemi, 2018. Monetary policy and control of inflation in Nigeria. International Journal of Management, IT & Engineering, 8(12): 154-170.

Akinbobola, T., 2012. The dynamics of money supply, exchange rate and inflation in Nigeria. Journal of Applied Finance & Banking, 2(4): 1-8.

Amassoma, D., S. Keji and O. Emma-Ebere, 2018. Looking inwards: is Money supply the cause of rising inflation in Nigeria? Journal of Economic and Social Development, 5(1): 6-18.

Amiri, K. and B. Talbi, 2014. Taylor rule in the context of inflation targeting: The case of Tunisia. Journal of Empirical Studies, 1(1): 30-37.

Bawa, S., I.S. Abdullahi and A. Ibrahim, 2016. Analysis of inflation dynamics in Nigeria (1981-2015). CBN Journal of Applied Statistics, 7(1): 255-276.

Bello, M.Z. and M.A. Saulawa, 2013. Relationship between inflation, money supply, interest rate and income growth in Nigeria 1980-2010: An empirical investigation. Journal of Economics and Sustainable Development, 4(8): 23-39.

Bozkurt, C., 2014. Money, inflation and growth relationship: The Turkish case. International Journal of Economics and Financial Issues, 4(2): 309-322.

Chaudhry, I.S., R.I.F. Farooq and G. Murtaza, 2015. Monetary policy and its inflationary pressure in Pakistan. Pakistan Economic and Social Review, 53(2): 251-268.

Chowdhury, A.R., M.Q. Dao and A.N. Wahid, 1995. Monetary policy, output, and inflation in Bangladesh: A dynamic analysis. Applied Economics Letters, 2(3): 51-55.Available at: https://doi.org/10.1080/135048595357555.

Dania, E.N., 2013. Determinants of inflation in Nigeria (1970 – 2010). The Business & Management Review, 3(2): 106-114.

Diermeier, M. and H. Goecke, 2016. Money supply and inflation in Europe: Is there still a connection? (No. 17/2016E). IW Policy Paper.

Ditimi, A., K. Sunday and O.O. Emma-Ebere, 2017. The upshot of money supply and inflation in Nigeria. Valahian Journal of Economic Studies, 8(2): 75-90.Available at: https://doi.org/10.1515/vjes-2017-0021.

Egwaikhide, F.O., L.N. Chete and G.O. Falokun, 1994. Exchange rate, money supply and inflation in Nigeria: An empirical investigation. African Journal of Economic Policy, 1(1): 57-73.

Fabian, E.M. and E.N. Charles, 2014. The impact of monetary policy rate on inflation in Nigeria. Journal of Economics and Sustainable Development, 5(28): 146-153.

Fullerton, J.T.M., 1993. Inflationary trends in Colombia. Journal of Policy Modeling, 15(4): 463-468.Available at: https://doi.org/10.1016/0161-8938(93)90030-t.

Gbadebo, A.D. and N. Mohammed, 2015. Monetary policy and inflation control in Nigeria. Journal of Economics and Sustainable Development, 6(8): 108-115.

Imimole, B. and A. Enoma, 2011. Exchange rate depreciation and inflation in Nigeria (1986–2008). Business and Economics Journal, 28: 1-11.

Iya, I. and U. Aminu, 2014. An empirical analysis of the determinants of inflation in Nigeria. Journal of Economics and Sustainable Development, 5(1): 140-150.

Johansen, S., 1988. Statistical analysis of cointegration vectors. Journal of Economic Dynamics and Control, 12(2-3): 231-254.Available at: https://doi.org/10.1016/0165-1889(88)90041-3.

Johansen, S. and K. Juselius, 1990. Maximum likelihood estimation and inference on cointegration—with applications to the demand for money. Oxford Bulletin of Economics and Statistics, 52(2): 169-210.Available at: https://doi.org/10.1111/j.1468-0084.1990.mp52002003.x.

Kamal, K.M.M., 2016. Investigating long-term relationship between money, income and price for Bangladesh: Application of econometrics and cross spectra methods. Journal of Science Foundation, 14(1): 17-25.Available at: https://doi.org/10.3329/jsf.v14i1.29498.

Kaouther, A. and T. Besma, 2014. Study of the relationship between economic growth and inflation: Application to the countries of the South side of the Mediterranean: A panel data approach. Journal of Social Economics Research, 1(8): 180-190.

Korkmaz, S., 2018. The relationship between money supply, inflation and economic growth in Mediterranean countries. Bandirma Onyedi Eylul University, Department of Economics, Faculty of Economics and Administrative Sciences.

Mbongo, J.E., F. Mutasa and R.E. Msigwa, 2014. The effects of money supply on inflation in Tanzania. Economics, 3(2): 19-26.

Mehrara, M. and A. Sujoudi, 2015. The relationship between money, government spending and inflation in the Iranian economy. International Letters of Social and Humanistic Sciences, 51: 89-94.Available at: https://doi.org/10.18052/www.scipress.com/ilshs.51.89.

Metwally, M.M. and S. Al- Sowaid, 2004. The main determinants of inflation in Egypt. The Middle East Business and Economic Review, 16(1): 30-38.

Murshed, M., S. Amin and M.H. Chadni, 2018. Causality analysis between inflation, budget deficit and money supply: Empirical evidence from Bangladesh. World Journal of Social Sciences, 8(3): 94-109.

Nair, S., K. Rabiunnesa and F. Mahamuda, 2018. Causal relationship of money supply and inflation: A study of Bangladesh. Asian Economic and Financial Review, 9: 42-51.

Odusanya, I.A. and A.A. Atanda, 2010. Analysis of inflation and its determinants in Nigeria. Pakistan Journal of Social Sciences, 7(2): 97-100.

Rakić, B. and T. Rađenović, 2013. The effectiveness of monetary and fiscal policy in Serbia. Industrija, 41(2): 103-122.Available at: https://doi.org/10.5937/industrija41-4011.

Sabade, S., 2014. Is money supply the cause of inflation in India? An alternative postulate to understand inflation. Procedia-Social and Behavioral Sciences, 133: 379-382.Available at: https://doi.org/10.1016/j.sbspro.2014.04.204.

Sasongko, G. and A.D. Huruta, 2018. Monetary policy and the causality between inflation and money supply in Indonesia. Business: Theory and Practice, 19: 80-87.

Taslim, M.A., 1982. Inflation in Bangladesh: A reexamination of the structuralist-monetarist controversy. The Bangladesh Development Studies, 10(1): 23-52.

Udoh, E., E. Udo, P. Abner, R. Ike, T. Tingir and U. Ibekwe, 2018. Effect of administrative capital expenditure on economic development; an emerging nation outlook. Journal of Internet Banking and Commerce, 23(1): 1-17.

Yousfat, A., 2015. Money growth and inflation: Empirical evidence from GCC region. European Journal of Business and Social Sciences, 4(07): 142-153.