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CAPITAL MARKET AND INFLATIONARY PRESSURE IN NIGERIA

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Abstract: Establishing the causative factors of inflation and designing appropriate strategies to curb rising inflation in Nigeria is of great concern to policymakers. This study examined the effect of capital market on inflation in Nigeria. Data were obtained from Central Bank of Nigeria Statistical Bulletin from 1986 to 2017 and analyzed using Augmented Dickey-Fuller test, Johansen co-integration test, Error Correction Model and Pairwise Granger Causality techniques. Findings from the study showed that inflation rate, market capitalization, number of deals, the volume of transactions and stock turnover ratio were stationary at first difference while the long run relationship was established among the variables. The result of the error correction model revealed that market capitalization, number of deal and volume of transactions did not stimulate inflationary pressure while stock turnover ratio contributed to the rising inflation rate. It was ascertained from the causality test that market capitalization, the number of deals, volume of transactions and stock turnover ratio did not granger cause inflation. The study concluded that the capital market did not induce inflation pressure in Nigeria. It was thus recommended that policymakers should encourage investment in the capital market to enhance economic development while focusing on adopting other potent policy frameworks such as interest rate manipulation, to curb the menace of inflation in Nigeria.

Keywords: Inflation, Capital Market, Error Correction Model

1. INTRODUCTION

Price stability is one of the major macroeconomic objectives of every nation because of the negative effect of erroneous purchasing power or high inflation rate on economic activities which impede the growth rate in the economy. Nwude (2013) opined that uncontrollable inflation may result in economic uncertainty and fall in the value of money which discourages investments in the economy.

Inflation which is the persistent rise in the general price level of goods and services in the economy may have an adverse effect on other macroeconomic variables such as per capita income, exchange rate, gross domestic product and financial assets return among others. Inflation has an undesirable effect on capital formation, investment, productive activities, distribution of income and welfare of the citizens (Shahbaz, Walid&Kalim, 2010; Khan, 2015).

Capital market plays a significant role in growth and development through the mobilization of financial resources from the idle sector of the economy to the needy or productive sector. The capital market provides a mechanism for the intermediation of financial resources through the creation of a wide range of financial assets which trigger investment and enhance growth in the economy (Faloye& Adekunle, 2016). Thus, the capital market remains one of the major institutions in the financial system of an economy.

However, for the capital market to perform its developmental role in the economy, the market must ensure effective distribution of idle financial resources for investment and productive purposes rather than for immediate consumption purpose. While one of the major functions of the capital market is to ensure liquidity in the economy, the distortion of the price level as a result of the indiscriminate allocation of resources in the economy is of major concerns to policymakers and monetary authority. The issue of information asymmetry in the allocation of financial resources which the capital market cannot grapple may result in the misallocation and over-creation of financial resources which may contribute to inflationary pressure in the economy.

In Nigeria, the stabilization of price level and control of inflation is vested with the Central Bank of Nigeria. Usman and Adejare (2013) stated that the capital market targeting strategy is one of the major strategies that are employed by the CBN to stabilize price and control inflation in the economy. However, the salient question is whether capital market contributes to rising inflation in Nigeria or not. The studies of Tripathi and Kumar (2014); Bai (2014); Antonakakis, Gupta and Tiwari (2016); Falahati, Nouri and Rostami (2012); Qamri, Abrar and Haq (2015); Mbulawa (2015) examined the effect of inflation on the stock market in developing and developed countries. Also, Daferighe and Charlie (2012); Usman and Adejare (2013); Akani and Ubor (2015); Harcourt (2017) investigated the effect of inflation on capital market in Nigeria. These studies did not consider the effect of capital market on inflationary pressure in Nigeria. This study thus examined if capital market activitiescontribute to increasing inflation in Nigeria.

The other partof this paper is structured into the following sections. Section 2 presents a review of related literature. Section 3 describes the econometric methodology. Section4 presents the empirical results. The final section concludes the study alongside recommendations.

2. LITERATURE REVIEW

Modigliani and Cohn (1970); Fama (1981) opined that the capital market efficiency and development plays an important role in the economy through the efficient allocation of resources for investments and real sector development. The channel through which the capital market influences the economy hovers around the creation of a wide range of financial assets and other markets frameworks through which investors can operate.

Studies have evolved over the years on the effect of inflation on the stock market. Tripathi and Kumar (2014) examined the long term relationship between inflation and stock returns in BRICS markets using panel data for the period from March 2000 to September 2013. The study employed correlation and Pedroni Panel co-integration test. The correlation results revealed a significant negative relationship between the stock market index and rate of inflation for Russia and a significantly positive relationship for India & China.The Pedroni panel co-integration test revealed that there is no long term co-integrating relationship between stock index values and inflation rates.

In the same vein, Bai (2014) looked at the effect of inflation on the stock market. The study employed correlation and Vector Auto-regression to examine the direction of the relationship between the Consumer Price Index and Stock Market Price. It was revealed that there is a negative and significant relationship between the Consumer Price Index and Stock Market price.

Antonakakis, Gupta and Tiwari (2016) adopted dynamic correlations of inflation and stock prices in the United States for 1791 to 2015 using a time-varying approach to examine the relationship between inflation and the stock market. The study revealed that correlations between inflation and stock prices in the United States evolve heterogeneously overtime. In particular, the correlations were significantly positive in the 1840s, 1860s, 1930s and 2011, and significantly negative otherwise.

Falahati, Nouri and Rostami (2012) investigated the connection between inflation and stock exchange development in Iran during the spring of 1999 up to late summer of 2008. The study employed a nonlinear model to examine the relationship between inflation and financial market development and analyzed using the conditional least squares method (CLS). The result showed that there is a positive relationship between inflation and indicators of stock market development.

Qamri, Abrar and Haq (2015) used data based on past ten years of Karachi stock exchange (KSE 100) to examined the relationship between inflation and stock prices in Pakistan which was analyzed using Ordinary Regression Model and it was revealed that there was a negative relationship between stock prices and inflation. Furthermore, it was indicated that when prices of stockswere low, firms avoided entering into the capital market until the central bank provided an alternative for firms' plans to invest in the capital market.

Mbulawa (2015) investigated the relationship between inflation and stock market development using Zimbabwean data from 1980-2008. The study employed the VECM approach to testing the dynamic relationship in the short and long term. It was found that there existed an insignificant and positive connection between inflation and performance of the stock market.

In Nigeria, Daferighe and Charlie (2012) investigated the impact of inflation on stock exchange performance in Nigeria using statistic data for twenty years from 1991 to 2010. The multivariate analysis was employed to evaluate the influence of inflation on various measures of stock exchange performance; market capitalisation. Total value traded ratio, the percentage change in All-share Index and turnover ratio. It was revealed that market capitalization, total value traded ratio and percentage change in All-share Index were negatively related to inflation while the total value traded ratio had a positive relationship with Inflation.

Usman and Adejare (2013) assessed the effect of inflation on capital market performance in Nigeria employing data from Central Bank of Nigeria statistical bulletin and Security exchange commission (SEC) covering the period of 1970 to 2010. The study employed multiple regressions to analyze data on variables such as inflation rate, market capitalisation, All-Share index, market volume and market turnover, and Gross Domestic Product. It was indicated that there is a negative relationship between inflation and capital market performance.

Akani and Ubor (2015) empirically investigated the effects of inflation on aggregate stock prices in Nigeria, between 1980-2012. Data on Stock Prices (ASP) and inflationary pressure measure were sourced from the Central Bank of Nigeria Statistical bulletin and Nigeria Stock Exchange Factbook. Engle-Granger and Johansen-Joselius method of co-integration, Granger causality Test and Augmented Dickey-Fuller Test (ADF) were employed and it was revealed that inflation rate and Broad money supply (M2) had a negative

and significant effect on aggregate stock prices while Narrow Money Supply (M1) showed positive and significant effects on aggregates stock prices.

Harcourt (2017) examined the relationship between macroeconomic variables and the performance of the Nigerian capital market by using quarterly time-series data covering the period between 1986 and 2009. The NSE all-share index and market capitalization were used as proxies for capital market performance. The study employed the Augmented Dickey-Fuller (ADF) test, Johansen co-integration procedure indicates that the variables are co-integrated and error correction model. The result of the error correction model revealed real gross domestic product had a positive impact on the performance of the capital market in Nigeria while inflation rate and prime lending rate had a negative effect on the performance of the stock market. Also, the foreign exchange rate of naira to one US dollar was established to have an insignificant impact on capital market performance.

Based on the review literature, it was found that much attention has not been given to the effect of the capital market channel on inflation in Nigeria. Also, while inflation rate may have a causal effect on capital market as indicated in past studies, it is open to question whether causality flows in the other direction and if capital market targeting strategy can be employed alongside other strategies in controlling inflationary pressure in Nigeria which generated the need for this study.

3. METHODOLOGY

This study employed times series data from 1986 to 2017. The data were secondary which was extracted from the Central Bank of Nigeria Statistical Bulletin (2017). The study relied upon correlational research design to examine the effect of market capitalization, the number of deals, the value of transactions and stock turnover ratio on inflation rate in Nigeria. The model was adapted from the empirical study of Usman and Adejare (2013) as stated below;

$$\Sigma Inf = \Sigma\alpha_0 + \Sigma\alpha_1 MCAP + \Sigma\alpha_2 SHI + \Sigma\alpha_3 MVOL + \Sigma\alpha_4 MTurn + \Sigma\alpha_5 GDP + \mu_6$$

The model for this study is given as:

$$INFR = f(MCAP, NOD, VOT, STR)$$
$$INFR_t = \lambda_0 + \lambda_1 MCAP_t + \lambda_2 NOD_t + \lambda_3 VOT_t + \lambda_3 STR_t + e_t$$

where:

INFR = Inflation Rate

MCAP = Market Capitalization

NOD = Number of Deals

VOT = Volume of Transactions

STR = Stock Turnover Ratio

— Method of Data Analysis

The techniques employed in this study include Augmented Dickey-Fuller test, Johansen co-integration test, Error Correction Model andPairwise Granger Causality. Augmented Dickey-Fuller test was adopted to determine the stationarity and order of integration of the variables. Also, Johansen Co-integration was employed to establish the long-run relationship while error correction mechanism technique was used to examine the short-run effect of market capitalization, the number of deals, the value of transactions and stock turnover ratio on inflation rate in Nigeria.

Furthermore, the study employed Pairwise Granger Causality to establish the direction of causality of market capitalization, number of deals, value of transaction and stock turnover ratio in relations to the inflation rate.

— Presentation and Interpretation of Results

In this section, results from the data analysis are presented and analyzed. The section presents results on the correlation matrix, ADF unit root, Johansen Co-integration, Error Correction Model and Pairwise Granger Causality Test.

— Correlation Matrix

Table 1 shows that correlation value of the independent variables in relation to the dependent variableis less than 70% which is an indication of the absence of multi-collinearity. Furthermore, the independent variables namely market capitalization; the number of deals, the volume of transactions and stock turnover ratio are negatively correlated with the inflation rate in Nigeria.

Table 1. Correlation Matrix

	INFR	MCAP	NOD	VOT	STR
INFR	1.000000				
MCAP	-0.356390	1.000000			
NOD	-0.379663	0.692786	1.000000		
VOT	-0.456111	0.834768	0.839183	1.000000	
STR	-0.421083	0.359443	0.771358	0.581693	1.000000

Source: Researcher's Computation, 2019

— **Summary of Unit Root Test**

Table 2 presents the result of the ADF unit root test for the variables and it shows that none of the variables is stationary at level because their t-statistics are less than their respective critical value in absolute term. However, at first difference, inflation rate, market capitalization, number of deals, the volume of transactions and stock turnover ratio are free from the problem of unit root which is an indication that the variables are integrated of 1(1). This implies that the variables may have long-run relationship which will be confirmed using Johansen Co-integration Test.

Table 2: ADF Unit Root Result

Variables	Level Form			First Differences			Order of Int.
	T-stat	5% Critical Value	P-value	T-stat	5% Critical Value	P-value	
INFR	-1.229641	-2.976263	0.6464	-4.629757	-2.976263	0.0010	1(1)
MCAP	0.461431	-2.960411	0.9824	-5.335865	-2.963972	0.0001	1(1)
NOD	-2.192480	-2.960411	0.2128	-7.102068	-2.963972	0.0000	1(1)
VOT	-1.370844	-2.960411	0.5835	-5.545268	-2.967767	0.0001	1(1)
STR	-2.524128	-2.960411	0.1197	-7.681918	-2.963972	0.0000	1(1)

Source: Researcher's Computation, 2019

— **Co-Integration Test**

The result of the long-run relationship using Johansen Co-integration is presented in Table 3 and it shows that the trace and max-Eigenvalue test indicates one co-integration among the variables. This implies that there is long-run relationship among inflation rate, market capitalization, number of deals, volume of transactions and stock turnover ratio leading to the rejection of the null hypothesis.

Table 3: Johansen Co-integration Test (Trace and Max-Eigen Statistic)

Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	Prob.**	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	74.53631	69.81889	0.0200**	34.98158	33.87687	0.0368**
At most 1	39.55473	47.85613	0.2388	23.29776	27.58434	0.1611
At most 2	16.25697	29.79707	0.6941	11.78670	21.13162	0.5688
At most 3	4.470271	15.49471	0.8622	3.764412	14.26460	0.8833
At most 4	0.705859	3.841466	0.4008	0.705859	3.841466	0.4008

Source: Researcher's Computation, 2019

— **Interpretation of Model Results**

The result of the Error Correction Model is presented in Table 4. The result indicates that high and uncontrollable inflation in the previous year will lead to inflationary pressure in the current year. Furthermore, market capitalization has a negative relationship with the inflation rate in both the previous and the current years. However, the relationship was statistically insignificant in the previous year but not statistically significant in the current year. This indicates that market capitalization does not contribute to inflationary pressure in Nigeria.

Table 4: Error Correction Model Dependent Variable: D(INFR)

Variables	Coefficient	Std. Error	t-Statistic	Prob.
D(INFR(-1))	0.587617	0.161892	3.629681	0.0018
DLOG(MCAP)	-11.54061	1.026927	-2.869724	0.0053
DLOG(MCAP(-1))	-25.14114	29.20205	0.860938	0.4000
DLOG(NOD)	-15.01999	6.843860	-2.194666	0.0408
DLOG(NOD(-1))	-12.49955	1.064329	-2.988631	0.0353
DLOG(VOT(-1))	-9.106979	3.209319	-3.390972	0.0002
DLOG(STR)	5.028911	7.811754	0.643762	0.5274
DLOG(STR(-1))	3.453386	4.747850	0.727358	0.4759
ECM(-1)	-0.971776	0.317495	-3.060765	0.0064
C	-1.948008	3.228936	-0.603297	0.5534
R-squared	0.768640			
Adjusted R-squared	0.641609			
F-statistic	2.504678			
Prob(F-statistic)	0.040804			
Durbin-Watson stat	2.052057			

Source: Researcher's Computation, 2019

Also, the result shows that the number of deals has a negative and significant effect on inflation rate both at lag one and current period. This is an indication that the number of deals exerts no pressure on inflation rate in Nigeria. Similarly, the result of the error correction model shows that the volume of transactions has a

negative and significant effect on inflation rate in Nigeria which indicates that the volume of transaction does not stimulate inflation in Nigeria.

Conversely, the error correction model result shows that stock turnover ratio has positive and insignificant effect on inflation rate in Nigeria. This is an indication that stock turnover ratio contributes to inflationary pressure in Nigeria (though not significantly) through high trading in the market which mainly may not be for productive purposes. Furthermore, it was revealed that the result has the right sign of error correction which is -0.971776 and significant at 5%. This implies that the model has self-adjust mechanism at a speed of 97% and any disequilibrium will be immediately adjusted at high speed.

In summary, the result shows that the R-squared is 0.768640 indicating that market capitalization, number of deals, volume of transactions and stock turnover ratio contributes 76% variation to movement in inflation rate. Also, the F-statistic of 2.504678 with a probability value of 0.040804 is significant at 5% showing that market capitalization, number of deals, volume of transactions and stock turnover ratio jointly and significantly influenced inflation rate in Nigeria.

Table 5 shows the result of the residual and stability test for the study. The table shows that regression residual is normally distributed with a probability value of 0.9667 which is greater than the acceptance region of 0.05. Also, it was found that the result was not serially correlated with a p-value of 0.7046. Furthermore, it was indicted that the result is homoscedastic with a p-value of 0.1487 which is insignificant at 5%. Finally, the result of the Ramsey Reset Test shows the absence of misspecification in the regression model.

Table 5: Residual and Stability Diagnostics

Diagnostics test	Observed value	P-value (Chi-square)
Normality Test	0.067160	0.9667
Breusch-Godfrey LM test for Serial Correlation	0.700117	0.7046
Heteroskedasticity Test: Breusch-Pagan-Godfrey	14.56588	0.1487
Ramsey RESET Test	0.386358	0.5420

Source: Researcher's Computation, 2019

— **Granger Causality Test**

Table 6 shows that there is independent relationship among variables. All the independent variables namely market capitalization, number of deals, volume of transactions and stock turnover ratio have independent causality with inflation rate. This implies that market capitalization, number of deals, volume of transactions and stock turnover ratio do not granger cause inflation rate with causality also not flowing from inflation rate to market capitalization, number of deals, volume of transactions and stock turnover ratio.

Table 6: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.	Result
MCAP does not Granger Cause INFR	30	0.72508	0.8835	Independent Causality
INFR does not Granger Cause MCAP		0.12451	0.4942	
INFR does not Granger Cause NOD	30	1.11785	0.3428	Independent Causality
NOD does not Granger Cause INFR		0.56042	0.5780	
VOT does not Granger Cause INFR	30	1.75314	0.1939	Independent Causality
INFR does not Granger Cause VOT		0.17921	0.8370	
STR does not Granger Cause INFR	30	7.48909	0.0542	Independent Causality
INFR does not Granger Cause STR		3.74567	0.1215	

Source: Researcher's Computation, 2019

4. CONCLUSION AND RECOMMENDATIONS

Price stability has been one of the macroeconomic objectives of the Nigerian government. This is because of the undesirable effect of price instability and inflationary pressure on other major macroeconomic variables. However, causative factor of inflationary pressure in the Nigerian economy has received attention in the recent years. Nonetheless, the effect of capital market as important segment of the financial system on inflation in Nigeria has not received much attention. This study thus, investigated whether capital market variables contribute to inflation rate in Nigeria. Findings from the study indicated that the operational activities of the capital market does not induce inflationary pressure in Nigeria. The study thus recommended that monetary authority can focus on the capital market by encouraging investments thereby improving economic development. The government should adopt capital market strategies alongside other effective strategies in order to curb inflation in Nigeria. This can be achieved by ensuring that the market serves as source of viable investment to investors who are willing to commit their idle resources on productive and high return investment.

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