

Financial System Development Amid of Price Volatility: The Known and Unknown about Nigerian Inflation

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Abstract:- This study established short and long run relationship between money supply, credit to the private sector and inflation rate in Nigeria, 1990 to 2020. The ARDL results revealed that credit to the private sector (CPS) had positive and non significant impact on inflation rate in Nigeria. Money supply (MS) had positive and statistically significant impact on inflation rate. The policy implication confirms that money supply and sectoral allocation of credit to private sector remains a veritable monetary policy instruments to attend economic objective of price stability. Based on the results, researchers recommend that timeframe of any monetary policy should be monitored to achieve such police objective than been defeated by implementation lag, and monetary authority should entrench plausible monetary policy instruments for optimal money supply and allocation of more funds to private sector of the economy to curb persistent price volatility.

Keywords:- Financial System, Development, Price Volatility and Inflation.

I. INTRODUCTION

The Nigeria financial system has experienced significant improvements in the efficiency and competitiveness both at the level of financial institutions and financial markets. These developments were reflected in the number, size and availability of financial institutions and markets. There are verifiable increases in financial service delivery and diversity of institutions, credit to the private, money supply as well the regulations and stability of the financial sector. The aggregate of financial system depth, access, efficiency and the legal environment also improved. These developments in the financial sector have not only led to the increase in the number of financial institutions, but also the development in level of sophistication with new payment systems and alternatives to holding money. However, the economic importance of financial system development remains inexhaustible, as its development described as sacrosanct to both economic growth and development. Many scholars described it as the pathway to economic growth and development. Tran and Nguyen (2020) stress the financial system in any economy assumes the highest position in economic development. Apart from its economic growth enriching effects, an efficient and well

developed financial system also contributes to economic development (Kiliç and Özcan, 2018). But the embodiments on this area of intellectual contexts were apparently on economic growth glaring the knowledge gap on economic development especially in achieving macroeconomic objective of price stability. Therefore, this study investigates the relationship between money supply, private sector credit on inflation rate in Nigerian, from 1990-2020.

II. REVIEW OF RELATED LITERATURE

Conceptually, the economic role of financial system development has different intellectual perceptions, but all bored down to sustainable economic growth and development. Financial literature is replete with empirical evidence that countries with well developed financial system tends to grow faster than their counterparts with less developed financial sector. Babu (2018), the financial system of a country is an important tool for economic development. Imoagwu and Ezeanyejì (2019) stress that financial system play a vital role in economic development and acknowledged that financial development is a multidimensional concept which constitutes a potentially important mechanism for long run economic growth and development.

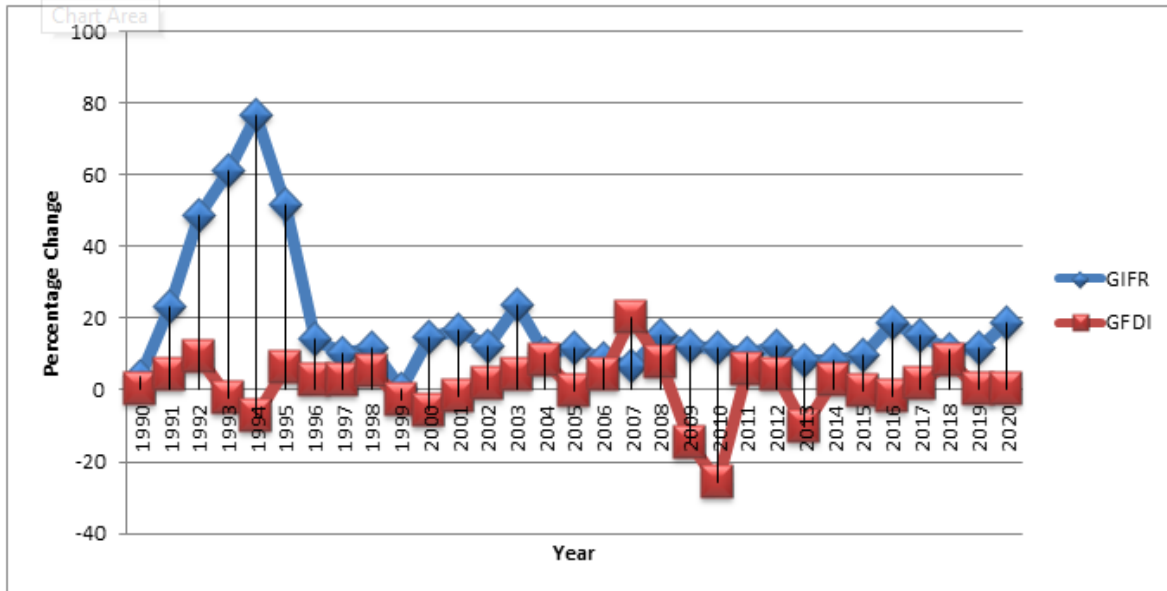
The role of financial system development on economic development

The importance of the financial system development in economic performance is deemed beyond increase in aggregate production in an economy, how economic growth effect the livelihood of citizenry or her living standard remains paramount in the any economic system especially in the area cost of living. The financial development of any nation also explain the allocation of monetary resources towards enhancing the quality of life, which is largely the basic premise of economic development (Destek, Sinha and Sarkodie, 2020). Adediran, Oduntan and Matthew (2015), empirical evidence indicates that well developed and efficient financial system has the capacity to create jobs, provide financial services that could cater for all, including the poor with a view to raising their living standard, financial development if well developed has the capacity to accelerate growth because of its potential influence on capital accumulation, technological innovation, resource allocation and productivity. The financial system helps the

economic development agenda and raising the financial system play a vital role in economic development and to be successful in the longer term, countries must take a holistic view by identifying and improving long term factors that are crucial to their development (Imoagwu and Ezeanyej, 2019).

The financial system of a country is an important tool for economic development (Babu, 2018). However, the relationship between financial system development and macroeconomic development indicators precisely inflation rate was presented in graphs 1 below.

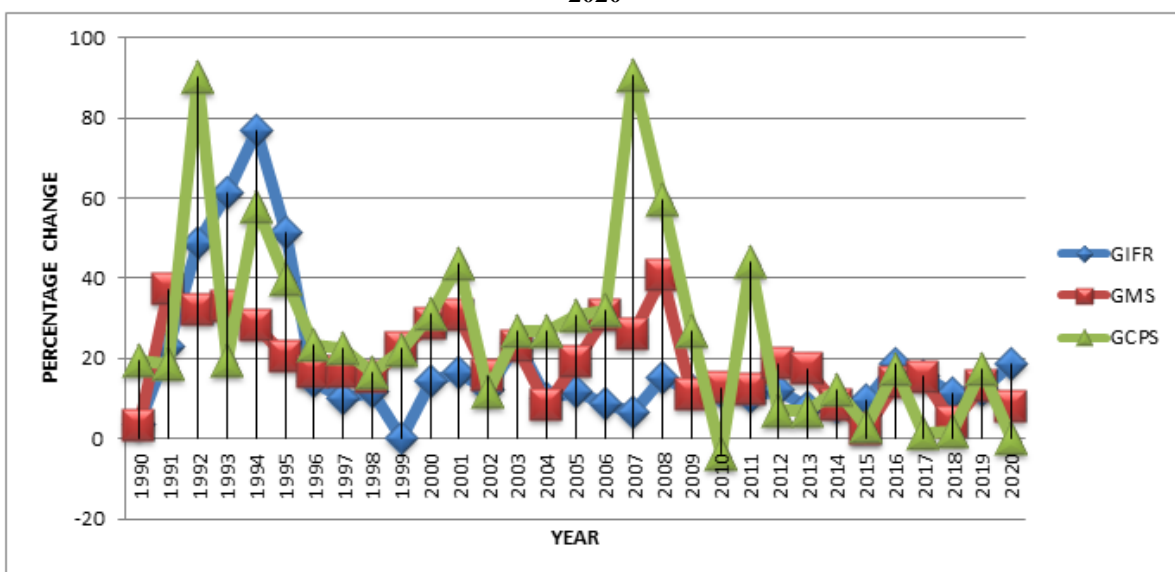
Graph 1: Trends of Financial Development Index (FDI) and inflation rate (IFR) in Nigeria, 1990-2020



Comparatively, the influence of FDI on IFR was weak as the graph above revealed a weak correlation between the two variables, while the average growth rate of FDI was 0.87%, IFR exhibited high growth rate of 17.95% on the average. There were persistent increases in general price of goods and services for 30th consecutive years mostly on double digits with highest inflationary pressure in 1994 by 76.8% and eased in 1999 by 0.2%, as headline inflation (year on year) moves upwards attributed to persistent

insecurity across the country, multiply taxations, lingering structural deficiencies, exchange rate depreciation and general price instability in the economy. While, FDI movements had the highest upward trend of 20% and downward by -25.74% in 2007 and 2010 respectively. The curve was relatively stable in 1990 and increased by 4.27% and 9.39% in 1991 and 1992 respectively, before sliding by -2.26% and -7.27% in 1993 and 1994 respectively.

Graph 2: Trend of Money Supply (GMS), Credit to the Private Sector (GCPS) and inflation rate (GIFR) in Nigeria, 1990-2020



The correlation between GMS and GIFR in graph 2 above confirms the economic objective of achieving price stability through monetary policy instrument. Whereas MS grew at the rate of 18.33% on 30year average, IFR recorded 17.95% exhibiting strong positive correlation and CPS was 27.01%. Aside CPS that slightly declined below the horizontal axis in 2010 by -3.81%, all the variables recorded positive trends throughout the period under review, although no record of constant return to scale and perfect correlation was observed. Whereas, annual movements of CPS and MS differs in rate with the highest in 2007 and 2008 respectively, there were persistent increase in general price of goods and services for 30th consecutive years mostly on double digits with highest inflationary pressure in 1994 by 76.8% and eased in 1999 by 0.2%, as headline inflation moves upwards attributed to internal economic problem due to persistent insecurity across the country, multiply taxation, lingering structural deficiencies, unfavorable balance of payment and exchange rate depreciation.

Theoretically, Endogenous growth theory maintains that economic growth is primarily the result of internal forces rather than external ones. The theory argues that economic growth is generated from within a system as a direct result of internal processes, that improvements in productivity can be tied directly to faster innovation and more investments in human capital from governments and private sector institutions. This theory was largely projected a positive relationship between financial sector development and economic performance and suggested that the activities within the economic system result in its' creation. The theory was built on the idea that improvement in innovation, knowledge and capital lead to increased productivity and positively affects the economic outlook. The model premises would be tested in this research work on the ground that financial system development colludes different measures of financial innovations and thus translate positively into the Nigeria economy vice versa as various regulatory framework predicates on financial innovations for financial system development and possible economic development.

Empirically, there are appreciable scholarly works on the nexus of financial system development and economic development. Iori (2020) reveals that financial sector development has positive and significant relationship with human development index (HDI) and a significant positive relationship between aggregate credit and HDI. Destek, Sinha and Sarkodie (2020) examined the impact of real income, government expenditures, and inflation on income inequality were in Turkey, ARDL bound test shows a positive impact of inflation on income inequality in the short run, while the reverse holds in the long run and an inverted U-shaped relationship with income inequality for overall financial development and banking sector development was confirmed. Nar (2020) observed that while financial development causes the accumulation of human capital, there was no significant causality directed from human

capital to financial development. Abrorov (2020) shows Sukuk fund had positive and significant impact on economic development in Malaysia. Akande (2019) paper investigated how financial development relates to unemployment in the short and the long run, taking into consideration different measures of financial development. ARDL estimate found that only financial system deposit to GDP has a potential to reduce the unemployment rate in the short and the long run. Alomari, Marashdeh and Bashayreh (2019) reexamined the relationship between financial market development and economic development in the context of competitiveness of developed and higher income countries and revealed financial market development, trade openness, labor market efficiency and technological readiness were positive and significant. Babu (2018) investigated the role and importance of financial system in the economic development of India and found that that the financial sector has acquired strength, efficiency and stability by the combined effect of competition, regulatory measures, and policy environment.

III. METHODOLOGY AND DATA ANALYSIS

Autoregressive distribution lag (ARDL) bounds test was adopted in the analysis and Adediran, Oduntan and Matthew (2015) model was modified by adjusting the variables.

According to Lawal et al. (2016) and Ogwumike and Salisu (2017), ARDL bounds test technique has several advantages over other estimations, as it could be applied regardless of the order of the integration of the regressors, either I(1) and/or I(0). It is a more statistically significant approach for examining correlation when faced with small data size as other techniques require large data size for validity to hold. It also allows for the variables to have different optimal lags, which is not applicable to other techniques. Therefore, the model was specifies thus:

$$\text{GIFR} = f \text{ (GFDI)} \dots \dots \dots (1)$$

$$\text{GIFR} = f \text{ (GCPS + GMS)} \dots \dots \dots (2)$$

$$\Delta IFR_t = \beta_0 + \sum_{t=1}^{n_1} \beta_1 \Delta IFR_{t-1} + \sum_{t=0}^{n_2} \beta_2 \Delta CPS_t - 1 + \sum_{t=1}^{n_3} \beta_3 \Delta MS_{t-1} + \phi_1 \Delta IFR_{t-1} + \phi_2 \Delta CPS_{t-1} + \phi_3 \Delta MS_{t-1} + \epsilon_t \dots \dots \dots (3)$$

Where: IFR is the inflation rate, CPS is credit to the private sector and MS is the money supply. Δ represents the percentage change. β₀ is the constant term and β₁... β₃ is the short-run coefficients. φ₁... φ₃ is the long-run coefficients, n₁... n₃ is the lag length and ε_t represents the error term.

Table 1 (A, B and C): Lag length selection

(A) GIFR						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-174.6075	NA*	10646.81*	12.11086*	12.15801*	12.12563*
1	-174.3548	0.470658	11212.01	12.16240	12.25669	12.19193
2	-174.0044	0.628296	11731.87	12.20720	12.34864	12.25150
3	-174.0039	0.000776	12582.04	12.27613	12.46473	12.33520
(B) GMS						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-173.9415	NA*	10168.84*	12.06493*	12.11208*	12.07970*
1	-173.4739	0.870756	10551.16	12.10165	12.19595	12.13118
2	-173.4721	0.003239	11309.02	12.17049	12.31193	12.21479
3	-172.4257	1.804212	11284.43	12.16729	12.35588	12.22635
(C) GCPS						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-119.7944	NA*	450.2885	8.947732	8.995726*	8.962003*
1	-118.7606	1.914381	449.2706*	8.945230*	9.041218	8.973773
2	-118.0419	1.277731	459.0275	8.966066	9.110048	9.008879
3	-118.0373	0.007816	494.7832	9.039800	9.231776	9.096885

*indicates lag order selected by the criterion.

Optimal lag length of zero (0) out of a maximum of 3 lag structure as selected by four different criteria was observed in table 1 above. Aside GCPS in C, final prediction error (FPE), Akaike information criteria (AIC), Schwarz information criterion (SIC) and Hannan-Quinn information criterion (HOIC) recorded the least values at the lag length of zero. The results of the ARDL bounds testing approach were also shown in table 2 below.

Table 2: ARDL Result

Dependent Variable: GIFR				
Method: ARDL				
Date: 06/24/21 Time: 21:27				
Sample (adjusted): 2 32				
Included observations: 30 after adjustments				
Maximum dependent lags: 1 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (0 lag, custom fixed):				
Fixed regressors: GCPS GMS C				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GIFR(-1)	0.684392	0.116472	5.876030	0.0000
GCPS	0.050719	0.108104	0.469163	0.6429
GMS	0.935339	0.160838	5.815410	0.0000
C	-13.62594	3.055526	-4.459441	0.0001
R-squared	0.989260	Mean dependent var	36.74767	
Adjusted R-squared	0.988020	S.D. dependent var	99.68748	
S.E. of regression	10.91093	Akaike info criterion	7.740973	
Sum squared resid	3095.259	Schwarz criterion	7.927800	
Log likelihood	-112.1146	Hannan-Quinn criter.	7.800741	
F-statistic	798.2604	Durbin-Watson stat	1.284825	
Prob(F-statistic)	0.000000			
*Note: p-values and any subsequent tests do not account for model selection.				

$GIFR = 0.684391571947 * GIFR_{(-1)} + 0.0507185827034 * GCPS + 0.935339493091 * GMS - 13.6259363924C$. P-Value = 0.6429 and 0.0000, > and < 0.05 critical value respectively. The results depict that credit to the private sector (CPS) had positive and non significant impact on inflation rate in Nigeria. This was explained by the positive coefficient value of CPS and the t-statistic less than two in absolute term and corresponding probability value of the t-statistic greater than five percent critical value. Money supply (MS) had positive and statistically significant impact on inflation rate. This also was explained by the positive coefficient value of MS and the t-statistic more than two in absolute term and corresponding probability value less than five percent critical value. The R^2 (0.989260) as the summary measure that shows how well the sample regression line fits the data indicates that 98.93% variation in IFR was explained by a change in CPS and MS, and the remaining 0.0107% was explained by variable not included in the model. The adjusted R^2 (0.988020) takes account of a greater number of regressors if included and it explains 98.80% variation in the dependent variable.

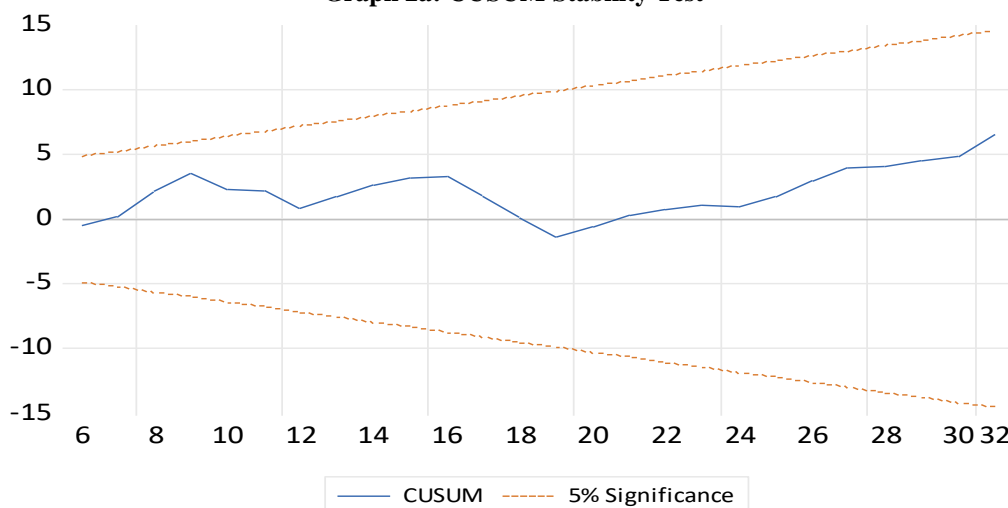
Table 3: ARDL Bounds Test for Cointegration

Variables	F-Statistics	Cointegration
F(GIFR/GCPS,GMS)	45.07665**	Cointegration
Critical value	Lower Bound	Upper Bound
1%	6.44	6.44
2.5%	5.39	5.39
5%	4.6	4.6
10%	3.8	3.8

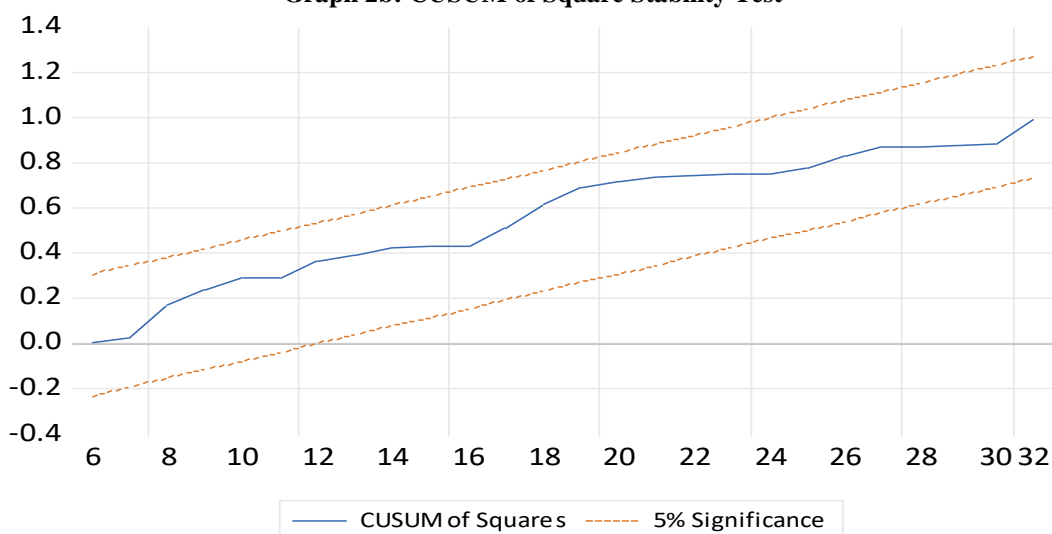
Notes: *** Statistical significance at 10% level; ** Statistical significance at 5% level; *Statistical significance at 1% level. The lag length k=0 was selected based on the AIC and SIC.

Table 3 above reveals long run relationship between real GIFR and the exogenous variables (CPS and MS). This was explained by F-statistic value of 45.07665 greater than integrated order bands (upper bound values) and the t-statistic.

Graph 2a: CUSUM Stability Test



Graph 2b: CUSUM of Square Stability Test



The CUSUM in the graph 2a and b above was used to test stability of the function. CUSUM and CUSUM Square plots stay within the critical 5% bounds, which confirm the long run relationship among the variables and stability of the coefficient.

IV. CONCLUSION/IMPLICATIONS OF RESULT AND RECOMMENDATIONS

This study established short run and long run relationship between money supply, credit to the private sector and inflation rate in Nigeria from 1990 to 2020. The ARDL results imply that units change in the CPS causes 0.0507185827034 change IFR and a unit change in the MS causes 0.935339493091 change in IFR both in the short run and long run, and policy implication confirms that money supply and sectoral allocation of credit to private sector remains a veritable monetary policy tools to attend economic objective of price stability in Nigeria. Based on the results, researchers recommend that timeframe of any monetary policy should be monitored to achieve such police objective than been defeated by implementation lag, and monetary authority should entrench plausible monetary policy instruments for optimal money supply and allocation of more funds to private sector of the economy to curb persistent price volatility.

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