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Effect of Macroeconomic Variables on Price Stability in Nigeria

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Abstract
This paper examined the effect of interest rates management on price stability in Nigeria. The study specifically ascertained the effect of inflation rate on price stability in Nigeria; the effect of exchange rate on price stability in Nigeria and the effect of consumer price index on price stability in Nigeria. The study used ex-post facto research design and Auto-regressive Distributed Lag (ARDL) model for the analysis of the secondary data sourced from the Central Bank of Nigeria Statistical Bulletin. The time span of the study covers 1970 - 2024. The result of the analysis reveals that the findings have profound implications for monetary policy in Nigeria. They suggest that focusing solely on domestic price control measures, such as managing inflation and consumer prices, may be insufficient to achieve price stability. Instead, policy makers must place a high priority on managing the exchange rate. The study among other things recommends that the Central Bank of Nigeria (CBN) should prioritize exchange rate stability through a comprehensive approach. This could include targeted interventions in the foreign exchange market, promoting foreign direct investment and non-oil exports, and building up foreign reserves to provide a buffer against external shocks. Policies that encourage local production and reduce import dependency could also lessen the impact of exchange rate volatility on domestic prices.

Key words: *Interest rate, Inflation rate, Exchange rate, Consumer Price Index, Foreign Direct Investment*

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I. INTRODUCTION

One of the major economic objectives of every government is to attain sustainable price stability in the economy capable of effecting positive changes to its economic growth. This could be achieved if the government, all things being equal is able to influence all the macroeconomic variables that could directly or indirectly exert influence and policy direction (Pam, Pam, Chinedu and Udoh, 2021). Price stability is essential globally because of its effect on the growth and development of every nation and among scholars who are brainstorming on the best way of maintaining a stabilized economy. Price stability refers to a situation where the general price level of goods and services in an economy is relatively stable over time, without significant fluctuations or inflation.

Despite a lot of policies through the Monetary Policy Rate (MPR), trade policies and so on, one of the most challenging economic issues facing Nigerian economy is the price instability bedeviling every economic strides of the government towards achieving its macroeconomic goals (Ogbonnaya, Otta, Onoja, Ikechukwu, Durueke and Okoro, 2022).

The management of macroeconomic variables becomes crucial in achieving sustainable price stability in Nigeria which its multiplying effects will among other things promote full employment, balance imports and exports, influence exchange rates and improve on the economic growth of Nigeria. The ability of the Central Bank of Nigeria (CBN) to rise or lower monetary policy rate (MPR) causes changes in the market costs of funds that translate to achieving price stability in Nigeria. The contention is that the level of inflation rate which is one of the major macroeconomic factors could be triggered by the cost of food and energy thereby causing price instability and affecting economic growth of the economy. This is just as the Central Bank of Nigeria (CBN) anchors its monetary policy rate (MPR) based on the prevailing inflation rate.

The consumer price index (CPI) and the volatile nature of exchange rate have become worrisome considering their implications on the price stability and economic growth of Nigerian economy (Akims, Omagwa and Mungai, 2020). Price instability has continued to influence the policies of the government, affecting demand and supply, the inflation rate, exchange rate and the periodic survey of consumer prices.

Presently, the general economic indicators are in bad conditions hence the level of the living standard of the people. The low production capacity and its attendant effects on the general prices of goods and services in the economy because of the low supply against demand level is worrisome thereby causing increase in the inflation rate (Raymond, 2014). This is the confirmation that Nigeria is a consuming nation, with its monetary and fiscal policies strategies failing to stabilize and control inflation.

The shortage of food in the country partly caused by insecurity and the high level of naira to dollar exchange rate responsible for the general suffering of the masses, reduction in production, causing unemployment and the consumer price indices in Nigeria unassuming. It has continued to drain the purchasing powers of consumers, reduced the standard of living of the people and increased the poverty level. Once the consumer price index (CPI) is unstable, the price stability is seriously in a bad shape because interest rate management measures is unchecked or under regulated against the desired economic goals of the country.

It is against this backdrop that the study to investigate the effect of macroeconomic factors on price stability in Nigeria becomes imperative to find a balance and rescue the economy from economic stagnation.

II. REVIEW OF RELATED LITERATURE

2.1 Empirical Review

Pam, Pam, Chinedu and Udoh (2021) reviewed the effects of interest rates on performance of manufacturing sector in Nigeria for almost four decades, using ordinary least square (OLS) and Auto-regressive Distributed Lag (ARDL) for the analysis of the data employed for the study. The result of the analysis revealed that interest rate has no effect on manufacturing sector output. Again, that interest rates do not have significant effect on capacity utilization. The result further indicates that interest rates has positive and significant effect on manufacturing value added in Nigeria, upon which the study offered the following recommendations among others that interest rates should be controlled and managed to a single digits by the regulatory authorities, so that the economic goals of price stability could be achieved.

Akims, Omagwa and Mungai (2020) study the price levels, Exchange rates, interest rates and return on equity of commercial banks in Nigeria. This study which highlight the importance of commercial banks in achieving the desired economic goals such as stable price level and maintaining sound and healthy financial system and the economy as a whole, employed causal research design and panel data for the period of 2010 - 2017 and analyzed with the help of multiple regression model. The findings of the analysis indicates that interest rates, price levels and exchange rates have significant and positive effects on return of equity of commercial banks in Nigeria for the period of the study. Based on the findings of the result, the study therefore recommends that price discrimination can be adopted by banks with the regulatory authorities putting in place measures capable of protecting the customers. The study further recommends that the issue of exchange rate should be addressed through increase in the production price level can be maintained.

Ali, Agbo, Ukwuaba and Chiemela (2017) investigated the effects of interest rates on access to Agro-credit by farmers in Kaduna states, Nigeria. The study adopted survey research method and used descriptive statistics and multiple regression techniques for the analysis of the data. The findings among others shows that Age, level of education, interest rate, credit awareness and farm's level of income were the major controlling factors and determinants in sourcing for Agro-credit and facilities among farmers in Kaduna State Nigeria for

the period of the study. The study therefore recommends that financial and government authorities should rise up to the challenges of high interest rate faced by farmers if food insecurity, inflation and exchange rates could be managed for the healthy growth of the economy at large and for the sustainability of the farmers in particular who are currently facing the highest hurdles of financing their projects.

Valkovszky and Vincze (2001) examined, on price level stability, real interest rates and core inflation. The study is directed at identifying the problems of monetary and fiscal policies with focus on price level stability, real interest rates and inflation. The study findings shows that inflation variability should always be provided when making certain economic policies and decisions, while real interest rate and price level should be controlled and managed through monetary and fiscal policies strategies where price stability should be the watch word.

2.2 Theoretical Framework

This study adopted theory of interest rate. This theory was propounded by the Swedish economist, wicksell in the year 1986 and later developed and supported by several other economists popular among is professors Robertson, Bertil Ohlin, Lindhal and Myrdal (1991). The major assumption of the theory holds that interest rate is determined by the demand and supply of loanable funds. And because there exist a market where loanable funds are supplied and those who borrow them, the rate of interest will be such as shall bring about equilibrium between the demand and supply.

III. METHODOLOGY

The design adopted by the study is *ex-post facto* research design because of the historical nature of the panel data used. The secondary data were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin for the period of this study.

The study was based on panel regression technique where price stability is expressed as a function of inflation rate, exchange rate and consumer price index. The general model of the study was adopted and modified from Akims, Omagwa and Mungai (2020).

$PS = f(IR + ER + CPL + \mu \ldots (1)$

The econometric form of the model was expressed as

$PS_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 ER_{it} + \beta_3 CPI_{it} + \mu_{it} \ldots (2)$

Where:

PS = Price stability proxied as GDP

IR = Inflation Rates, measured as a log of inflation

ER =Exchange Rate, measured as a log of Exchange rate

CPI = Consumer Price Index, Measured on the basis of periodic survey of consumer prices.

μ = Error term representing all other variables not specified in the model

t = Tim frame

$\beta_1 - \beta_3$ = Are the parameters in the model to be estimated

The study employed Auto-regressive Distributed Lag (ARDL) model to analyze the variables.

IV. RESULTS AND DISCUSSION

The focus of this study was to evaluate the effect of interest rate management on price stability in Nigeria for a 55 year period (1970-2024). The researcher conducted pre estimation tests (unit root test) with a view to ascertain the stationarity of the variables. The summary result of the unit root test for stationarity is presented on table 1 below:

Table 1: Summary Result of ADF Unit Root Test

Variable	ADF Stat	p-value	Decision	Level of Integration
PS	-3.879500	0.0040	Stationary	1(0)
CPI	-4.123212	0.0020	Stationary	1(0)
INFLR	-3.183706	0.0236	Stationary	1(0)
LNEXR	-7.622243	0.0000	Stationary	1(1)

Source: Author's Computation (E-views 10)

The unit root test results indicate the stationarity of the variables. A variable is considered stationary if its statistical properties, like mean, variance, and autocorrelation, are constant over time. This is a crucial assumption for many time series models. From the result, the variables with an order of integration of I(0) which were price stability, consumer price index, and inflation rate, means they are stationary at their level form. This implies that any shocks or disturbances to these variables are temporary and they tend to revert to their long-run mean. The exchange rate, with an order of integration of I(4), is a highly unusual result. This means the variable was non-stationary and required being differenced four times to become stationary. An I(4) variable indicates

that shocks have a very persistent and cumulative effect, and the series has multiple "stochastic trends." This is rare in economic data and suggests a very high degree of non-stationarity, which may require further investigation into data quality or the model specification. To treat this, we had to take the log return of the exchange variable which became stationary at 1(1).

Next, we had to re-run the unit root tests for all the other variables (price stability, CPI, and inflation) to confirm their order of integration after transforming the exchange rate. The previous findings of I(0) for these variables did not change. At this stage, since the new exchange rate variable is I(1) and the others are I(0), we cannot proceed with a standard cointegration test given that cointegration analysis requires all variables to be integrated of the same order, typically I(1). Staring before us are two options (either we choose to exclude the exchange rate variable from the model or retain it). If we decide to exclude the exchange rate from the cointegration test and focus on the relationship between the I(0) variables, we would use standard regression methods (Ordinary Least Squares - OLS) as there is no need to correct for non-stationarity. However, if we want to include the exchange rate, we must first find a way to make it and the other variables have the same order of integration which might involve differencing the I(0) variables to make them I(1) for the purpose of the cointegration test; this is not a good practice as valuable information could be lost. We opted for a more robust approach which was to use a Vector Autoregression (VAR) model. Given that we have a mix of I(0) and I(1) variables, we can use a Vector Autoregression (VAR) model that is appropriate for mixed orders of integration. This allows you to analyze the dynamic relationships between all the variables without being constrained by the cointegration assumption. Thus, we proceeded to run the VAR.

Given that interpreting the results of a VAR model involves more than just looking at the coefficient estimates, which can be difficult to interpret on their own. Our focus was on the main tools for interpretation of VAR result which are the Granger causality tests, Impulse Response Functions (IRFs), and Forecast Error Variance Decomposition (FEVD).

Granger Causality Tests

The Granger causality test helps determine if one variable's past values can help predict another variable's current value. It does not imply a true cause-and-effect relationship, but rather a correlation in the temporal sense. This involved an F-test conducted to check if the coefficients of the lagged values of a variable in another variable's equation are jointly significant. A significant p-value (typically less than 0.05) will indicate that the null hypothesis (that the lagged values of the variable do not "Granger-cause" the other variable) can be rejected. The result is presented on table 2 below:

Table 2: Granger Causality Test Result

Pairwise Granger Causality Tests
Date: 08/20/25 Time: 05:07
Sample: 1970 2024
Lags: 2

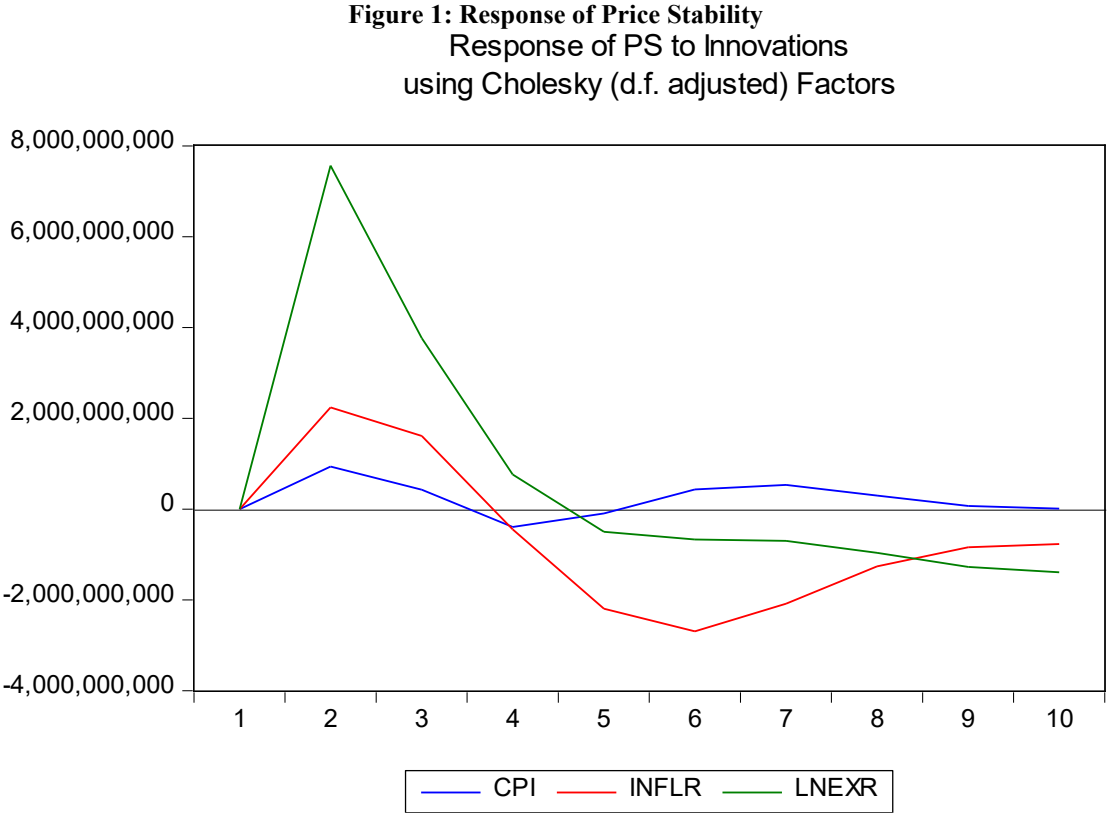
Null Hypothesis:	Obs	F-Statistic	Prob.
CPI does not Granger Cause PS	54	0.23314	0.7929
PS does not Granger Cause CPI		2.39701	0.1016
INFLR does not Granger Cause PS	54	0.30444	0.7389
PS does not Granger Cause INFLR		1.84487	0.1689
LNEXR does not Granger Cause PS	54	3.92765	0.0262
PS does not Granger Cause LNEXR		0.77174	0.4677

Source: Author's Computation (E-views 10)

From the result (Table 2), the p-values for the consumer price index (0.7929) and inflation rate (0.7389) are both high (well above 0.05). This means there is no statistically significant evidence that past values of the consumer price index or the inflation rate can help predict future price stability, they do not Granger-cause price stability. However, the p-value for the log return of the exchange rate is 0.0285, which is below the 0.05 significance level. This indicates that the log return of the exchange rate Granger-causes price stability. This implies that past fluctuations in the exchange rate contain information that is useful for forecasting future changes in price stability. The results imply that past values of the exchange rate significantly predict future price stability, while inflation and consumer prices do not. This suggests exchange rate volatility is a key driver of price stability.

To take a another look at the VAR result, we proceeded to run the impulse response function (IRF) in order to trace the effect of a one-standard-deviation shock to one variable on all other variables in the system and understand the dynamic interaction between the variables over the period 1970 to 2024. The result is presented below:

Figure 1: Response of Price Stability



The model simulated a sudden, unexpected shock to the exchange rate variable (a one-standard-deviation increase in the log-return of the exchange rate) and then plotted the response of all variables to that shock over a 10year future periods. It was revealed (see figure 1) that the shock to the exchange rate initially led to an increase in inflation, which then dissipated over several periods.

The third VAR too employed by the study in analyzing the VAR result was the forecast error variance decomposition (FEVD) which provides a more quantitative way to interpret the VAR results by showing the proportion of the forecast error variance of each variable that is explained by shocks to all other variables in the system. The result of the variance decomposition test is given below:

Table 4: Variance decomposition result

Variance Decomposition of PS:					
Period	S.E.	PS	CPI	INFLR	LNEXR
1	2.28E+10	100.0000	0.000000	0.000000	0.000000
2	2.71E+10	91.41308	0.119158	0.682036	7.785730
3	2.79E+10	89.69112	0.136259	0.980609	9.192011
4	2.79E+10	89.59186	0.156049	1.004463	9.247624
5	2.80E+10	89.02064	0.156058	1.613582	9.209717
6	2.82E+10	88.16517	0.177160	2.509792	9.147876
7	2.83E+10	87.64566	0.210543	3.025923	9.117873
8	2.84E+10	87.40697	0.219758	3.203528	9.169745
9	2.85E+10	87.19335	0.218974	3.272068	9.315606
10	2.86E+10	86.94779	0.217876	3.328757	9.505574

Source: Author's Computation (E-views 10)

Table 4 above is the variance decomposition result breaking down the forecast error variance of the price stability variable into components attributed to shocks from each of the independent variables (consumer price index, inflation rate and exchange rate), and identify the most influential variables in the system. From the result, in period 1, 100% of the price stability forecast error variance is due to its own shocks, a common finding as there's no time for other variables to have an impact. By period 2, the influence of other variables became apparent. The exchange rate emerged as the most significant external factor, explaining 7.79% of the price stability's forecast error variance. In contrast, the consumer price index and inflation rate have a negligible impact, contributing only 0.12% and 0.68%, respectively. This indicates that while the price stability's own shocks still dominated, the exchange rate was the primary driver of the external fluctuations of price stability in the short term. This result implies that shocks to the exchange rate are a key driver of short-term volatility in price stability in Nigeria since 1970. This highlights the critical importance of effective exchange rate management as a primary tool for policymakers to maintain stable prices.

V. Discussion of Results

The analyses conducted (unit root test, VAR, Granger causality, and FEVD) provide a clear and consistent picture of the relationship between the chosen variables. Initially, the variables' mixed orders of integration (I(0) and I(4)) posed a challenge, but the transformation of the exchange rate to its log return (I(1)) allowed for a robust VAR analysis. The Granger causality test revealed a significant finding: the past values of the log return of the exchange rate are a powerful tool for forecasting future price stability. In contrast, inflation and the consumer price index were found to have no significant predictive power over price stability. This result is strongly supported by the Forecast Error Variance Decomposition (FEVD). In the short term (period 2), while price stability's own shocks explain the majority of its volatility, shocks to the exchange rate account for the most significant portion of the external influence. This confirms that the exchange rate is a key transmission channel for external shocks affecting price stability in Nigeria. The minor contributions of inflation and the consumer price index reinforce the Granger causality findings. The Impulse Response Functions (IRFs) showed that a shock to the exchange rate leads to a relatively swift and significant response in price stability, while shocks to inflation and the CPI would produce a much smaller or insignificant response.

VI. CONCLUSION AND RECOMMENDATIONS

The study aimed to investigate the effect of macroeconomic factors on price stability in Nigeria, using GDP as a proxy for price stability. The findings from the econometric analyses consistently point to the exchange rate as the most critical variable influencing price stability. The results from the Granger causality test and the Forecast Error Variance Decomposition both indicate that shocks and past values of the exchange rate have a statistically significant and substantial impact on price stability. The study, therefore, concludes that external shocks transmitted through the foreign exchange market are a primary driver of price instability in Nigeria. The traditional domestic inflation and consumer price index metrics, while important, were found to have a much weaker short-term relationship with price stability in this particular model.

The findings have profound implications for monetary policy in Nigeria. They suggest that focusing solely on domestic price control measures, such as managing inflation and consumer prices, may be insufficient to achieve price stability. Instead, policymakers must place a high priority on managing the exchange rate.

The Central Bank of Nigeria (CBN) should prioritize exchange rate stability through a comprehensive approach. This could include targeted interventions in the foreign exchange market, promoting foreign direct investment and non-oil exports, and building up foreign reserves to provide a buffer against external shocks. Policies that encourage local production and reduce import dependency could also lessen the impact of exchange rate volatility on domestic prices. While the inflation rate and consumer price index variables did not show a direct causal link to price stability in this study, they remain important for monitoring overall economic health. The results do not suggest that they should be ignored. Policymakers should continue to monitor and manage them, as they can still reflect underlying economic issues. However, the study's findings indicate that efforts to control these variables may not be the most effective first line of defense for ensuring price stability. Acknowledging their weak predictive power in this context allows for a more focused and effective policy mix

References

[1]. Akims, M.A., Omagwa, J. and Mungai, J. (2020) Price levels, Exchange Rates, Interest rates and Return on Equity of Commercial Banks in Nigeria, *Research Journal of Finance and Accounting,* 11(10): 86-97.

[2]. Ali, B. M., Agbo, F. U., Ukwuaba, I. C. and Chiemela, C. J. (2017) The Effects of Interest Rates on Access to Agro-credit by Farmers in Kaduna State, Nigeria, *African Journal of Agricultural Research,* 12(43). 3160-3163.

[3]. Pam, C. T., Pam, Y. G., Chinedu, O. M. and Udoh, F. S. (2021) Effects of Interest Rates on Performance of Manufacturing Sector in Nigeria, *International of Advanced Research in Statistics, Management and Finance, 8(1): 96-116.*

[4]. Onoh, J.K. (2007) Dimensions of Nigeria's Monetary Policies- Domestic and External, Aba, Astra Meridan Publishers.

[5]. Raymond, A. R. (2014) An Econometric Analysis of Effect of Changes in Interest Rates on Inflation in Nigeria, *International*

Journal of Economics, Commerce and Management, 2(10):1-24.

[6]. Ogbonna, I.O., Otta, N.N., Onoja, T.C., Ikechuwu, E.O; Durueke, C.N. (2022). Monetary Policies Framework in Nigeria: A Structural VAR Representation, *Journal of Economics and Finance, 13(3):51-61.*

[7]. Valkovszky, S. and Vincze, J. (2001) on Price Level Stability, Real Interest Rates and Core Inflation, National Bank Hungry, NBH Working Paper.