

Inflation Dynamics and Food Prices in Nigeria

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Abstract

In Nigeria, inflation dynamics and food prices have been a major concern for policymakers and the public alike. In recent years, the country has experienced a surge in food prices, which has contributed to the rise in inflation. This study employs the linear autoregressive distributive lag model to investigate inflation dynamics and food prices in Nigeria, with a specific focus on identifying the fundamental factors driving the increase in food prices. Using annual data from 1990 to 2021, the study examines the relationships between oil price, exchange rate, money supply, and government expenditure, and their varying long- and short-term effects on inflation and food prices in Nigeria. The Bound test cointegration results confirm that the variables are cointegrated, highlighting the presence of a long-term relationship among them. Our findings reveal that higher oil prices exert a short-term large positive influence on food prices, but their long-term impact is negligible. Conversely, increased money supply significantly impacts food prices in both the short and long term. Additionally, an increased exchange rate inversely impacts food prices in the long-term. These results highlight crucial policy implications for curbing food price increases, reducing the welfare effects while, maintaining lower prices and ensuring its sustainability.

Keywords: Food prices, Inflation, Dynamics, ARDL, Nigeria

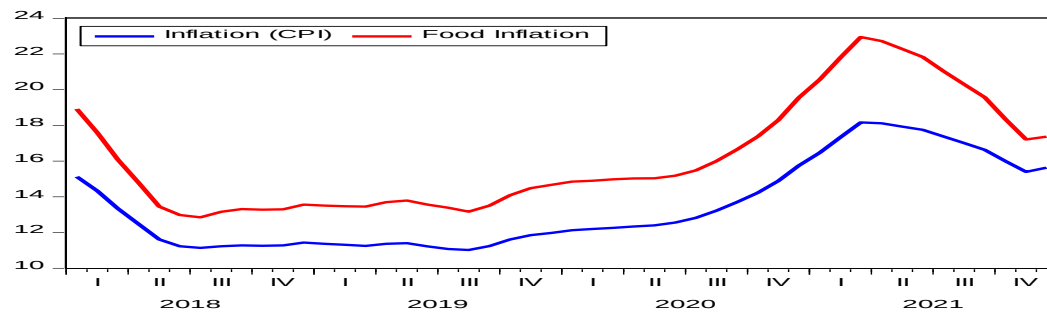
JEL Classification: C22, E31, Q18

1.0 Introduction

Over the years, skyrocketing food prices in Nigeria have attracted considerable interest from the general public, media, policymakers, and government. Perhaps this is as a result of the outcry and concern as it relates to the potential consequences on Nigerian household consumers and their living standard which has been on the downturn owing to the rising volatility in prices of agricultural products (Omotayo, Omotoso, Daud, Omotayo, & Adeniyi, 2022). However, the effects of this growing variability in the prices of agricultural products are not only limited to macroeconomic instability, but also extend to small farmers and household consumers who spend a larger portion of their income on consumption. As a result, changes in food costs cause substantial changes in inflation targeting (Mustafa, 2021). Theoretically, monetary and real shocks are mainly associated with rising food prices (Samal, et al., 2022). However, both the monetarist and structuralists

models can be used to explain these. The money supply is considered passive, according to structuralists, and real shocks in a given industry generally drive up food prices inflation. Consequently, prices for other commodities increase. Monetarists, on the other hand, contended that inflation might develop through an independent increase in the supply of money owing to increased aggregate demand, which raises other commodities' relative costs.

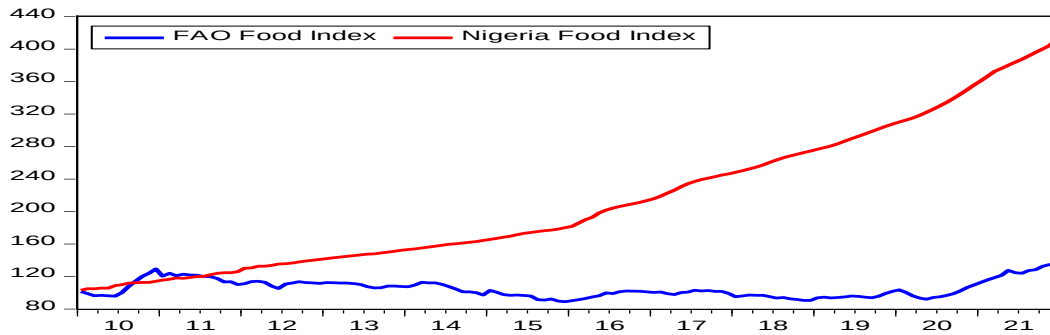
Figure 1 Food and overall inflation in Nigeria



Source: Author's Compilation (2023)

The country's inflation forecast using data from CBN, (2022) shows a downward trend from 15.37% in December 2017 downward to reaching its lowest 11.02% in August, 2019. It rose highly to 11.98% and to 12.13% in December 2019 and January 2020 respectively, it then drops to 12.2% in February 2020, which after it began skyrocketing owing to the global economic crises and the Covid 19 pandemic and enforced by the lockdown across all economies. The trend also shows that period of high rate of inflation corresponds to period of rising food prices, and vice versa. For example, in August 2019 the food inflation was 13.17% and the inflation in the period was 11.02 percent. But with the overall food inflation rate rising to 14.67 percent in December 2019, the inflation rate grew to 11.98 percent from 11.02 in August, 2019. This pattern of trend relationship between inflation and food inflation follows for other years up to 2021. This data therefore suggests a favourable relation between changes in food prices and the Nigeria's inflation rate. Therefore, it indicates that rising food costs either cause rising inflation rates or vice versa. There may be a number of causes behind Nigeria's ongoing rise in food costs, particularly over the last three years. These variables could include structural changes, oil price volatility, agricultural policies, exchange rate, population and income growth, climatic conditions, money supply, and the price of agricultural inputs, among others (Bawa, Abdullahi, & Ibrahim, 2016; Dahiru & Sulong, 2017)

Figure 2 World and Nigeria food price indices



Source: Author's compilation (2023)

Figure 2 illustrates that Nigeria and global food prices moved in tandem until 2011. However, since then, there has been a divergence between the two price indices. Despite a decline in global food prices after 2014, Nigeria's food costs continued to rise, becoming one of the primary factors contributing to inflation.

Several studies have looked into the relationship among oil, inflation, and food prices in an effort to identify strategies that might lessen the unfavorable rising food costs (Bane, 2018; Oloko, Ogbonna, Adedeji, & Lakhani, 2021; Durevall, Loening, & Ayalew Birru, 2013). However, most of the studies have only given attention to oil prices as one of the driving factors of food inflation. Some claimed that the price of oil and the cost of food are significantly related (Feldkircher & Pierre, 2019; Shehu, Shafii, & Yau, 2019; Deluna, Loanzon, & Tatlonghari, 2021; Nusair, 2019). Others discovered that fluctuations in the price of oil had little impact on food inflation (Mustafa, 2021; Oloko *et al.*, 2021). Examining the causes and effects of price booms and dips has become more popular because of the current dynamics of the global food prices. According to the relevant literatures, a number of variables could be blamed for the recent increases in both domestic and foreign food prices. For instance, greater energy costs raise the cost of energy-related inputs and increasing the cost of producing agricultural goods. The growing and wealthier global population also have an impact on the production and consumption of agricultural products. Climate change-related global warming can potentially have a detrimental impact on agricultural production and lead to an increase in food costs (Ertuğrul & Seven, 2021).

However, research on the dynamics of inflation and rising food price in Nigeria is scarce and still in its infancy. Therefore, this study looks into the factors that contribute to Nigeria's rising food prices. The world food price, exchange rate, oil prices, money supply and exchange rate are the key variables driving food inflation. This is because the variables are all interrelated and affect each other. For example, an increase in oil prices leads to an increase in transportation costs, which in turn increases the cost of food production and distribution. Similarly, an increase in the exchange rate leads to an increase in the cost of imported goods such as fertilizers and pesticides, which are essential for food production. An increase in money supply can lead to inflation, which can cause food prices to rise. Moreover, exchange rates can also affect food prices by making imports more expensive and exports cheaper (Makun, 2021; Samal et al., 2022a; Sun, Gao, Raza, Shah, & Sharif, 2023). Examining the determinants of food inflation in Nigeria is the core objective of this study. The remaining sections of the study are organized as follows. The literature review in section two briefly summarizes the empirical studies that explain inflation dynamics and the key factors influencing inflation of food prices in various nations. The technique, data source, model, and estimating methods are all presented in section three. Results and discussion of findings were presented and discussed in section four. Whereas conclusion and policy recommendations are presented in the fifth Section.

2.0 Review of Related Literature

Several studies have been undertaken by scholars on the dynamics of inflation and food prices in several countries across different continents. For example, Kashif, Hong, Naseem, Akram, and Meo (2022) investigated the asymmetric behavior of the relationship between oil prices and food inflation in Pakistan. The NARDL results demonstrate co-integration and provide significant support for the long-term favorable impact of rising oil prices on food prices. In the interim, no evidence of dependency was observed between fall in oil prices and food costs. They also found that, positive changes in oil prices only have a significant short-term impact on food costs. Moreover, Sultana and Qayyum (2018) studied the variables influencing the inflation of food prices in Pakistan. The basic regression results demonstrated that all variables—food import, GDP, taxes and food exports, have significant positive impact on food prices, except money supply, which exert negative impact. Hemmati, et al. (2018) conducted study on the external determinants of Inflation in Iran. The findings demonstrated that elements such as the exchange rate, money supply, import price index, and tightening of sanctions all contribute to an increase in the general price index over time. In another study, Samal, et al. (2022) analyzed

the effects of macroeconomic variables on food prices inflation in India. The long-run estimates' coefficients demonstrate that money supply, per capita income, agricultural wages and the price of food have significant positive impact on food inflation both in the short and long-run. Whereas supply for food grain inversely affect food prices both in the short and the long-run. Bhattacharya and Sen Gupta (2017), on the other hand, looked at the causes and effects of food inflation in India. The result highlighted a number of variables associated with the food inflation in India. On the other hand, it was found that that agricultural wage inflation is a major determinant of inflation, as well as food inflation. Additionally, food inflation is moderately impacted by fuel inflation, and the impacts vary depending on the commodity. Işık and Özbuğday (2021) also investigated the asymmetric reactions of Indonesian food prices to oil prices. The results showed that with exception of preserved fish prices, food prices are asymmetrically impacted by oil prices. Beans and nut prices are the most impacted followed by cereals, roots and their products. Mustafa (2021) used the Structural Vector Auto Regression (SVAR) model to explore the causes of high food prices in Turkey. The study took into account both international and domestic factors, including exchange rate, interest rate, producer pricing for agricultural products, and food prices worldwide. Although oil prices and worldwide food prices have not had a substantial impact, domestic factors such as producer pricing, interest rate, exchange rate and money supply were found to be contributing causes to the high price of food. In a different study, Ertuğrul and Seven (2021) showed that while oil prices lessen the growing gap between Turkish and international food costs, the exchange rate exerted a significant effect on it.

For Nigerian food prices, a recent study by Shehu *et al.*, (2019) explored the effect of oil shock asymmetry on food prices. The study used a non-linear autoregressive distributive lag method in examining both the effect of oil shocks asymmetry on both the short run and long changes in food prices. Findings from the study showed that while positive changes in the price of oil have a significant positive impact on food prices, negative shocks have no such impact. Furthermore, Balcilar and Bekun, (2020) examined the spillovers across price inflation and agricultural commodity prices for the case of Nigeria. The study employed the Diebold and Yilmaz spillover index to achieve this objective. The empirical results showed that the total spillover effect was about 75%, suggesting a high interconnectedness of the selected agricultural commodity prices and inflation. Ajibade, Ayinde, and Abdoulaye, (2020) studied food price volatility in Nigeria and its driving factors. The study utilized the GARCH approach to investigate the factors spanning 1970-2019. The study revealed that insurgency, political stability in neighboring

countries, trade liberalization, GDP per capita, inflation rate, government effectiveness, crop production, crude oil price, and exchange rate were prominent drivers of volatility in food commodity prices. In another study, Oderinde, Akano, Adesina, and Omotayo, (2022) examined the trends in climate, socioeconomic indices, and food security in Nigeria using data from 1980 to 2019. Using descriptive statistics and coefficient of variation, the study found that climate change, political instability, rising food prices, and erratic energy supply have had distressing consequences in the areas of affordability, availability, and stability of food supplies.

In sum, the literature review shows that few researches have examined the inflation dynamics and food prices in Nigeria as well as other emerging nations. The review also shows that the majority of past researches have concentrated on the inflation of overall prices (Headline Inflation), rather than on food prices. It also showed that there were only a few researches that looked at the driving factors of food inflation in Nigeria. Hence, food prices and inflation dynamics in Nigeria were the subject of a few studies (Bawa, Abdullahi, & Ibrahim, 2016; Shehu, Shafii, & Yau, 2019, and S. Alimia, D. Oslaniranb, & Ayubac, 2020). However, none of these studies examined the dynamics of food prices and inflation in the context of the country's 2016–2020 recession, which was brought on by a sharp decline in oil prices, shoddy handling of the currency crisis, and the COVID-19 pandemic's effects. This however, opened door for more investigation and further research on the inflation dynamics and food inflation in Nigeria. The time frame was chosen to reflect both the economic downturn experienced between 2016 and 2017 in the country as well as the impact of recent shocks in energy market on food prices. In light of this, this study explored both the short and the long-term causes of food inflation in Nigeria using annual data from 1990 through December 2021. By extending the sample period until 2021, it makes it possible for the research to capture how the recent oil crises have affected domestic food prices. By utilizing the autoregressive distributed lags (ARDL) model, this research builds on previous researches by analyzing the short-run and long-run effects of money supply, exchange rate, oil prices and government expenditure on food prices.

3.0 Methodology

This study uses annual data from 1990-2021. This was informed by data availability for the variables under study in Nigeria. Moreover, this period captures the large fluctuations in oil prices, the fall in the world oil price to \$32 in January 2016 its lowest since 2003 which resulted to economic recession in the country and the 2008

global food crises that ravages the world. The FAO food index, which measures the monthly variation in the international prices of a basket of food commodities, is used to estimate food prices. It shows the weighted average for the group of five commodity price indices over period of 2014 to 2016 divided by the average share of export for each group (FAO, 2022). Money supply (measured in millions) comprises of cash held outside formal financial system, demand deposits with the exception of federal government demand deposits, time savings, and foreign currency deposits made by non-federal residents, cheque by banks and travelers, as well as other securities including certificates of deposit and commercial papers. Exchange rate denotes the rate at which a currency is exchanged for another which has been established by either the national authorities or the exchange market authorized by law. An annual average (a unit(s) of local currency in relation to a unit of US dollar) are computed from the monthly averages (WDI, 2022). Additionally, Government expenditure is measured in percentage of the gross domestic product. Lastly, the oil price is the cost in US dollars at which a barrel of crude oil is exchanged in the international oil market. The food prices were extracted from the Food and Agriculture Organization (FAO, 2022) Statistics, the exchange rates were collected from world bank development indicators, the oil prices were from international monetary fund data bank and money supply from Nigeria's Central Bank Data bank (CBN, 2022).

Model specification

Given the mixed integration order of integration among the variables of study, we applied Autoregressive Distributed Lag (ARDL) model by (Pesaran, Shin, & Smith, 2001). It was adopted because of its capacity to discover long-run relationships between variables, its efficiency in small sample sizes, and, most importantly, its applicability regardless of distinct level of integration of the variables in the model. Following Olayungbo, (2017), the model can be specify as;

$$FP_t = \beta_0 + \beta_1 OILP_t + \beta_2 EXCH_t + \beta_3 MS_t + \beta_4 GEXP_t + \varepsilon_t \dots \dots \dots 1$$

Here, FP implies food prices, OILP implies global oil price, EXCH implies exchange rate, MS implies money supply and GEXP implies government expenditure

Eq. (1) shows that FP depend on OILP, EXCH, MS and GEXP at time t while ε_t indicates error term which accounts for determinants outside the model. Like in Shehu and Muhammad, (2022), we specify the ARDL as follows:

$$\begin{aligned}
\Delta FP_{it} = & \theta_0 + \theta_1 FP_{jt-j} + a_1 OILP_{jt-j} + a_2 EXCH_{jt-j} + a_3 MS_{jt-j} + a_4 GEXP_{jt-j} \\
& + \sum_{j=1}^b \beta_1 \Delta FP_{jt-j} + \sum_{j=1}^b \beta_2 \Delta OILP_{jt-j} + \sum_{j=1}^b \beta_3 \Delta EXCH_{jt-j} \\
& + \sum_{j=1}^b \beta_4 \Delta MS_{jt-j} + \sum_{j=1}^b \beta_5 \Delta GEXP_{jt-j} + \varepsilon_{it} \dots \dots \dots 2
\end{aligned}$$

The long run coefficients are θ_1 ; a_1 ; a_2 ; a_3 and a_4 , while the short run coefficients are β_1 ; β_2 ; β_3 ; β_4 and β_5 . Thus equ. 3 specifies the error correction model (ECM) to estimate the short-run adjustment to equilibrium.

$$\begin{aligned}
\Delta FP_{it} = & \theta_0 + \sum_{j=1}^b \beta_1 \Delta FP_{jt-j} + \sum_{j=1}^b \beta_2 \Delta OILP_{jt-j} + \sum_{j=1}^b \beta_3 \Delta EXCH_{jt-j} \\
& + \sum_{j=1}^b \beta_4 \Delta MS_{jt-j} + \sum_{j=1}^b \beta_5 \Delta GEXP_{jt-j} + pECT_{jt-j} \\
& + \varepsilon_{jt} \dots \dots \dots 3
\end{aligned}$$

ECT_{jt-j} represents the error correction mechanism which measures the speed of adjustment of any short-run disequilibrium into long run equilibrium. The convergence of short-run disequilibrium into long-run stability requires the negativity and statistical significance of the coefficient of Error Correction Term (ECT) significant.

4.0 Result and Discussion

Table 1. Descriptive Statistics

Variables	Food Price	Oil Price	Exchange Rate	Money Supply	Government Expenditure
Mean	83.90625	49.90332	137.1893	9325355.	94.01941
Median	77.10000	44.20646	128.9370	3217911.	93.80081
Maximum	131.9000	112.0117	381.0000	39955126	105.5820
Minimum	53.10000	13.12622	8.038285	68662.50	76.94907
Std. Dev.	24.20350	31.67316	105.4332	11162492	6.286966
Skewness	0.444983	0.623279	0.737225	1.134845	-0.528815
Kurtosis	1.928231	2.167941	2.803298	3.306505	3.454799
Jarque-Bera	2.587637	2.994970	2.950260	6.993915	1.767229
Probability	0.274222	0.223692	0.228749	0.030289	0.413286
Sum	2685.000	1596.906	4390.058	2.98E+08	3008.621
Sum Sq. Dev.	18160.10	31098.86	344601.3	3.86E+15	1225.304
Observations	32	32	32	32	32

The descriptive statistics for the variables utilized in the study from 1990 to 2021 are shown in table 1. The statistics demonstrates the distribution and variability of the data used in this study for exchange rate, money supply, food prices and oil prices. The table's median and mean values for the variables are practically indistinguishable from one another, indicating low variation and symmetry. Average fp, exch and oilp are N83.90, N137.19 and US \$49.90, while the average value of money supply is N 9,325,355.0

Unit root test

The time characteristic of variables included are explained by stationarity test. These characteristic are examined using the Phillip-Perron (1988) and the Augmented Dickey and Fuller (1981) test. The absolute p-value of PP or ADF tests is less than 5% critical value, indicating stationary or non-stationary variables. Money supply and government expenditure are stationary at I(0), while oil prices, exchange rate and oil prices, exchange rate, and food prices are stationary at I(1). This result indicates the mixture of order of integration among the variables of study and hence the ARDL bound testing technique can be applied to examine cointegration relationship between fp, oilp, exch, ms, and gexp.

Table 2: Unit root Results

Variables	Stationarity of all Variables in Levels		Stationarity of all Variables in First Difference	
	Without trend	With trend	Without trend	With trend
Panel A: Philip Perrons (PP)				
<i>Lfp</i>	-0.9662	-2.0370	-4.2192***	-4.1489**
<i>Loilp</i>	-1.0048	-1.8873	-4.8592***	-4.7472***
<i>Lexch</i>	-2.0065	-2.3032	-5.1588***	-5.3736***
<i>Lms</i>	-3.4694**	-0.5465	-3.2135**	-4.1371**
<i>Gexp</i>	-3.6344**	-4.2414**	-16.4781***	- 16.7721***
Panel B: Augmented Dickey Fuller (ADF)				
<i>Lfp</i>	-0.8284	-4.0101**	-4.3083***	-4.2402**
<i>Loilp</i>	-1.0877	-1.8873	-4.9216***	-4.7954***
<i>Lexch</i>	-1.9061	-2.2739	-5.1581***	-5.2604***
<i>Lms</i>	-3.4694**	-0.4061	-3.2135**	-4.0803**
<i>Gexp</i>	-3.6366**	-4.2648**	-8.1656***	-8.0201***

Source: Authors' computation (2022)

Note that the symbols *, ** and *** denotes stationarity at 10%, 5% and 1% significance levels, respectively.

VAR Selection Criteria**Table 3: VAR Lag Order Selection Criteria**

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-132.3481	NA	0.006521	9.156540	9.390073	9.231249
1	6.432613	222.0491*	3.40e-06*	1.571159*	2.972357*	2.019414*
2	23.27730	21.33660	6.82e-06	2.114847	4.683709	2.936648

* indicates lag order guided by the information criterion

Source: Author's Computation (2023)

Table 3 shows the recommended optimal lags for the given equation output for the various criteria. Therefore, in order to determine the long-run relationship among the variables this study used a single lag.

Bound Cointegration Test

Bound cointegration test measures the long-run association between the variable using the ARDL bound testing after determining the variables integration order and the maximum lags to be used

Table 4. Bound test for ARDL (1, 1, 0, 1, 0)

Test Statistic	Value	K
F-Statistics	6.268505	4
Critical Value Bounds		
Significance Level	I(0) Bound	I(1) Bound
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Source: Author's Computation (2023)

From table 4, the null hypothesis of no cointegration is rejected since the F-statistics exceed the upper critical bounds at 10%, 5%, 2.5% and 1% levels of significance, therefore we accept the alternative hypothesis signifying the presence of cointegration.

Table 5. Result of the long run and short-run analysis

ARDL(1, 1, 0, 1, 0)				
Dependent Variable; fp				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Panel I: Long run result				
Constant	0.452141	0.665712	0.679183	0.5038
LOG(OILP)	0.115249	0.101100	1.139951	0.2660
LOG(EXCH)	-0.511588****	0.086913	-5.886240	0.0000
LOG(MS)	0.350328***	0.073165	4.788154	0.0001
GEXP	0.005703	0.006246	0.912913	0.3708
Panel II: Short run result				
DLOG(OILP)	0.330636****	0.043241	7.646288	0.0000
DLOG(MS)	0.463540***	0.074157	6.250809	0.0000
CointEq(-1)*	-0.588931****	0.087035	-6.766634	0.0000
Panel III: Diagnostic Tests				
LM Test:	1.541336(0.2374)			
BGP Test	0.322694(0.9358)			

Normality	0.973959(0.614480)
CUSSUM	Stable
CUSSUMQ	Stable

a) Numbers in parentheses are prob. Values

b) Normality based on Jarque-Bera p-value

c) LM Test: Breusch-Godfrey Lagrange Multiplier Test for Serial Correlation

d) Breusch-Pagan-Godfrey Test for Heteroskedasticity

In panel I of Table 5, the ARDL long-run results reveal that both the exchange rate and money supply have a statistically significant relationship with food prices, while that of oil prices and government expenditure is insignificant. Specifically, a 1 percent appreciation in exchange rate leads to a 0.51 percent decrease in food prices at a 1 percent significance level. This downward pressure on food prices may be attributed to a reduction in food imports. This finding corroborates with Samal *et al.*, (2022) whose results shows that food prices decreases as a result of an appreciation in exchange rate through importation cut in petroleum products, other agricultural products and manures in the long-run. The use of local and organic manures like animal dumps in commercial agricultural practices can further neutralize the dependency on fertilizers, contributing to price stability and mitigating the adverse effect on food prices. On the other hand, a 35% rise in food prices results from a 1% increase in money supply. Additionally, the results suggest that food prices increase by 12% and 6% as a result of a 1% increase in oil prices and government expenditure respectively, which are statistically insignificant. This finding corroborates Oloko *et al.*, (2021) which suggested that the monetary policies of oil-importing and exporting countries are accommodating towards oil price shocks, and that inflation does not increase significantly as a result of these shocks.

Moving to Panel II of Table 5, the short-run estimates of the ARDL estimates confirmed the presence of cointegration among the variables of concern, supporting the applicability of the error correction model (ECM) to analyse short-run relationship. The study finds find that food prices are significantly impacted by oil prices and money supply. Specifically, a 1 percent increment in oil prices results in a statistically significant 33% increase in food prices. This positive relationship

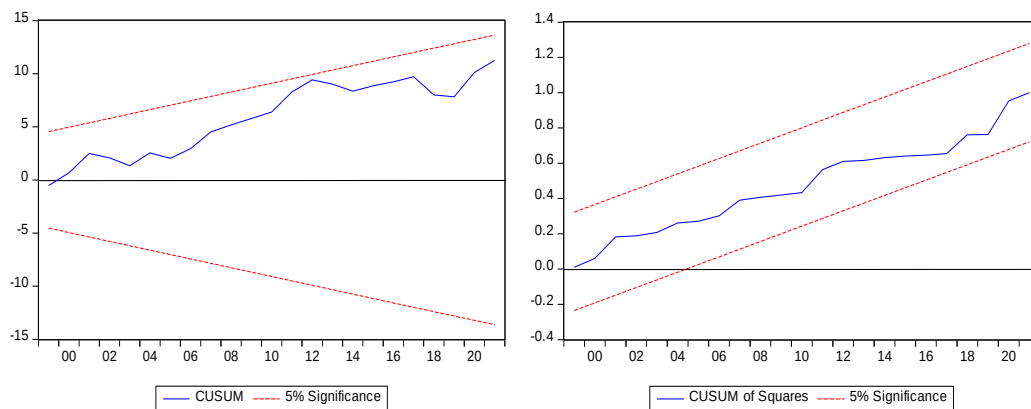
between food and oil prices corroborates with the observations during the food crises periods between 2007 to 2011 (Ibrahim, 2015). This can be traced to oil being a significant input factor in most food production, hence increasing oil price results to an increment of cost incurred in food production, this result corroborates with the cost-push inflation theory of inflation as it relates to food inflation in Nigeria. Moreover, in modern agriculture, oil products are among the major sources of power for farm machinery and equipment. These machines are responsible for transporting inputs to the farm and output to the final customer. As a result, all these essential components of the modern food system are under pressure due to the rising cost of oil prices. Studies that's supports these results are Ibrahim, (2015); Taghizadeh-Hesary, Rasoulinezhad, & Yoshino (2019).

Consistent with the long-run results, the short-run results for money supply indicate significant positive association with food inflation, indicating that a 1 percent increase in money supply leads to a 46% increase in food prices in Nigeria. This increase in money supply positively impacts food prices by driving aggregate market demand, resulting to higher food prices. This finding corroborates the results of Bawa et al., (2016); Mustafa Ozan Yildirim, (2021); Samal et al., (2022) which also demonstrated that an increase in money supply leads to higher food prices due to increased aggregate demand. However, the results contradict the findings of Qayyum and Sultana, (2018) whose results suggests that money supply causes reduction in food prices.

Lastly, the Error Correction Model (ECM) result indicates a negative and significant sign showing the speed of adjustment towards the long run equilibrium, at 1 percent significance level. The result shows that it takes, it takes approximately 0.59 year for the relationship to converge to equilibrium state after a deviation resulting from short-run shocks. This implies a moderate speed of adjustment. The long-run findings implies a direct relationship between money supply and food inflation, with a continuous increase in money supply leading to higher food prices, and an inverse connection between the exchange rate and food prices in Nigeria. However, the short-run results suggesting a direct short run relationship between oil and food inflation.

To ensure the robustness and reliability of the model, diagnostic tests were conducted (panel III of Table 5). The results of these tests confirm that our model's residuals are not serially correlated and free from heteroscedasticity. The p-value of the LM test for serial correlation indicates that we cannot reject the null

hypothesis signifying no serial correlation. Likewise, the Breusch-Pagan-Godfrey test for heteroscedasticity reveals that the model is free from heteroscedasticity, as the p-value of the f-statistics is higher than 5 percent. Additionally, the stability of the model estimates over time was tested using the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMQ). The results, at a 5 percent significance level, indicate that both series fall within the critical intervals, suggesting the absence of structural breakpoints in the model.



5.0 Conclusion and Policy Recommendations

This study examined the inflation dynamics and food prices in Nigeria, identifying the fundamental drivers behind the continuous surge in food prices. The empirical results obtained using the ARDL model for 1990-2021 indicate that both EXCH and MS have significant relationships with food inflation in Nigeria. Furthermore, a 1 percent increase in oil prices resulted in a significant 33% increase in food prices in the short run. The ECM results indicate a negative and significant ECM coefficient, suggesting that deviations from the equilibrium caused by shocks would take approximately 59% for the explanatory variables to readjust. This moderate speed of adjustment highlights the interconnectedness between money supply, exchange rates, and food prices, reinforcing the importance of maintaining stability in these variables to prevent excessive food price fluctuations. Diagnostic tests were conducted to ensure the reliability of our model, and the results validated the robustness of our findings. Owing to the necessity of food, the continuous surge in prices calls for greater domestic and international concern. As food is a basic necessity, the adverse effects of such price increases and high volatility necessitate continuous monitoring of food prices over time. To curb the continuous rise in

prices and reduce their effects, the study recommends that policymakers consider measures to stabilize the exchange rate which can help mitigate upward pressure on food prices by promoting the stability of food imports. From a medium- to long-term perspective, the government should also formulate policies and initiatives that are specifically tailored to small-scale farmers. These policies should concentrate on providing credit and technical assistance to small-scale farmers to augment food production and alleviate poverty in rural areas. The Brazilian National Program for Strengthening Family Agriculture (PRONAF) policy can serve as a valuable model for Nigeria to emulate. The government should also ensure strict compliance and consistency in the implementation of these programs. This is because past and present policies and initiatives that have been implemented in Nigeria to increase food production, such as Operation Feed the Nation, Green Revolution, and Anchored Borrower Program, have not been entirely successful in achieving their objectives.

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