

**DETERMINANTS OF FOOD INFLATION IN NIGERIA**

**LAWAL ESTHER. O.**

**Department of Economics**  
**Babcock University**  
**Ilisan Remo, Ogun State**

**AND**

**ONYIMA NNENNA. N.**

**Department of Economics**  
**Babcock University**  
**Ilisan Remo, Ogun State**

**Abstract**

*The rising food inflation in Nigeria has become a growing concern. This study is an attempt to identify the factors that determine food inflation in Nigeria. Secondary time series data was gathered from CBN Statistical Bulletin and World Development Indicators spanning 1981-2019. The Vector Auto Regressive (VAR) Model was applied to investigate the relationship between food inflation (CPI) and some of its determinants such as exchange rate, money supply, food import and interest rate in Nigeria. Findings show that food import has a positive relationship food inflation. Exchange rate and money supply also has a positive impact on food inflation. Interest rate has a negative relationship with food inflation. This study recommends that local production should be encouraged to increase exports and reduce imports to avoid dumping and ensure that food inflation is reduced, thus contributing to economic growth and development. Also, government should create policies that help reduce exchange rate in order to reduce food inflation.*

*Keywords: Food inflation (CPI), Money supply, Exchange Rate, Food imports, Interest Rate, VAR Model*

**Introduction**

Inflation has remained one of the most significant macroeconomic challenges facing Nigeria and other developing countries. Prolonged inflation makes future price levels more uncertain, and thus inflation volatility can impede growth even if inflation on average remains restrained (Phillip 2012). Structural economists argued that inflation might not be the outcome of excess demand, high and rising costs or the willful desire of businessmen to earn more profits by raising the price of their products but the manifestation of structural rigidities in the system when supply creates bottlenecks as there are shortages and persistence fiscal deficits (Kumapayi, Abiola Adeola; Nana, Joseph Ufuoma; Ohwofasa, 2012)

Inflation is a monetary phenomenon, and it has been the goal of monetary authorities to achieve price stability. Growth in money supply translates to a rise in the price of available output as the increased money supply merely confers enhanced purchasing power on citizens. Also, due to the unemployment of resources, an increase in money supply adds to prices and raises the level of output as more resources get engaged

**LAWAL ESTHER. O. & ONYIMA NNENNA. N.**  
**DETERMINANTS OF FOOD INFLATION IN NIGERIA**

---

in production (Okoye et al., 2019). Rising food prices could also be attributed to the underinvestment in the agricultural sector. The agricultural sector has suffered a consistent decline in growth, although it has remained a growth driver for the Nigerian economy (Adamgbe, E. T., Belonwu M. C., Ochu, 2020). A continued depreciation of our local currency and the overall difficult microeconomic situation our country faces, civil insecurities in some parts of the country (northwest and northcentral), reduced output in some areas due to weather and atypically high market demand caused by large purchases made by international bodies and local factories are some of the main drivers behind the persistent increase in prices. Overall, food prices have raised 50-100 percent above their levels from the previous year. (FAO 2021).

The price of food in Nigeria has become considerably higher and more volatile since 2012 (Uduji, Joseph I.; Okolo-Obasi, Elda N.; Asongu, 2019). Food prices in Nigeria reached an all-time high of 16% as of September 2020, following a 0.52% increase from its values in July 2020 (15.48%). According to FAO reports, Africa is the continent most affected by the food crisis, with 54% of the global number of people in crisis or worse. Nigeria is one of the ten countries in Africa that constitute the worst food crisis and accounts for 65% of the total population in crisis or worse. Food insecurity affects food affordability with leads to food inflation. Food insecurity can be affected by conflict/security, weather extremes (climate change) and economic shocks. It was forecasted that the number of acutely food-insecure people would go up by 40% in June-August 2020, and border closures would continue to limit food imports and increase prices. (FAO 2019).

The coronavirus pandemic (COVID-19) has also affected food prices from the border closure to the break-in supply chain of food distribution. The effects of food inflation are different for different people. Those who import a large amount of food and households and individuals who spend a large amount of their income on food are negatively affected. Also, those who export food items are affected positively by an increase in food prices. Over the years, the variation in prices of food in Nigeria has also been attributed to many factors, including variances in the bargaining power among consumers, natural disasters such as flood, pests, diseases, and the inappropriate response of farmers to price signals (Ayinde et al., 2016).

Food inflation is becoming a great concern to policy makers because of the unstable prices of agricultural commodities, which reduces purchasing power, particularly that of households, thereby depressing real income per capita (Egwuma and Ojeleye, 2017). Food prices affect an economy in several ways, such as cost of living, investments and trade balances (Mustafa and Stvarajasingham, 2019). The sudden and significant increase in food prices has been attributed to many factors such as exchange rate, lending rate, money supply, real GDP per capita, stocks, and oil prices (Fasanya and Olawepo, 2018). Therefore, the goal of this study is to examine the determinants of food inflation and evaluate the influences of various macroeconomic variables on food inflation in Nigeria. The rest of this paper is organized as follows. Section 2 and 3 contains the literature review and methodology while section 4 and 5 is the discussion of result and the conclusion of the study.

### **Review of Literature**

#### **Evidence from Developed economies**

Farhad, Ehsan and Naoyuki (2018) examined the volatility linkages between energy and food prices in select Asian countries over 2000-2016 using the Panel VAR model. The

estimation result concluded that there is a positive correlation between oil price and food price. Furthermore, the relation between biofuel price and food price is positive, while the correlation between oil price and biofuel price is negative. Also, a higher inflation rate has a significant positive impact on food prices.

Cuma (2014) examined money, inflation and growth relationship in Turkey by using a cointegration test. For this purpose, the 1999.2 –2012.2 period was taken, and quarterly data of money supply (M2), GDP, the velocity of money and deflator were used. According to the results from this paper, money supply and velocity of money were a primary determinant of inflation in the long run in Turkey. On the other hand, 1% decreases in income directly reduced inflation by 1%.

Ansgar, Ingo and Volz (2012) investigated the relationship between global liquidity and commodity and food prices for the period 1980 to 2011 by using a global cointegrated vector-autoregressive model. The empirical results proved that there is a positive long-run relation between global liquidity and the development of food and commodity prices and that food and commodity prices adjust significantly to this cointegrating relation.

Henna, Zainab and Kemal (2012) analyzed the determinants of food prices for the period of 1970-2017 by using an autoregressive distributed lag model. The results indicated that money supply is the most important variable that affects food prices both in the long run and in the short run. The study also found that in the long run, subsidies can help reduce food prices.

Jungho and Won (2009) analyzed the factors affecting US food price inflation. Using data from 1989-2008, Johansen multivariate co-integration analysis and vector error-correction model (VECM) were used to determine the long-run and short-run relationship among the dependent and independent variables (food price, commodity price, energy price, exchange rate, and ethanol production). The findings show that agricultural commodity prices and exchange rate play critical roles in affecting the short and long-run behaviour of U.S. food prices. Also, energy price has been a significant factor influencing U.S. food prices in recent years; in the long run, it has little impact on U.S. food prices in the short run.

### **Evidence from Developing/Emerging Economics**

Inim, Udo and Prince (2020) examined other determinants of inflation in Nigeria using the autoregressive distributed lag (ARDL) method on quarterly data from January 1999- December 2018. Findings show that poor infrastructural development, exchange rate, political instability, corruption, and double taxation significantly stimulate inflation rather than just the money supply. The results showed a causal relationship between other determining factors and inflation. The ARDL result showed a significant long-short run relationship.

Ngozi, Adeyemi, Ogundipe, Ifeoluwa and Adediran (2019) contributed to the literature on inflation dynamics by examining whether internal or external factors drive inflationary pressure in Nigeria. Using the annual time series data from 1981 to 2017 and applying Johansen cointegration analysis, the vector error correction mechanism and the impulse response function, the study revealed some compelling evidence to suggest that external forces are responsible for inflationary pressure in Nigeria. The results, amongst others, revealed that: external drivers – exchange rate, imported inflation and openness induced a positive and direct relation to inflation and the internal drivers; government expenditures, net food exports and lending interest rate dampened inflation.

**LAWAL ESTHER. O. & ONYIMA NNENNA. N.**  
**DETERMINANTS OF FOOD INFLATION IN NIGERIA**

---

Umi, Khalid and Ghani (2018) investigated the supply-side determinants of food price through a price transmission perspective using monthly data from 1991 to 2013. A Vector Error Correction Model (VECM) was employed and empirical results confirmed that world food commodity prices and real effective exchange rate are the primary determinants of food prices in Malaysia. In contrast, changes in the vertical transmission channel may have been muted by government price controls and subsidy programs or the industry's organization.

Fasanya and Olawepo (2018) examined the determinants of food price volatility in Nigeria using monthly data from January 1997 to April 2017. The multivariate GARCH approach was employed to evaluate the level of interdependence and volatility dynamics across these markets. In particular, the Baba-Engle-Kraft-Kroner (BEKK) model and the Dynamic Conditional Correlation (DCC) model were used for estimation. The findings showed that information shocks originating in Consumer Price Indices (CPI), lending rate, exchange rate, and oil market directly affect the current conditional volatility in the food market. In contrast, the information shocks originating in food directly affects the current conditional volatility in all the markets considered except oil. These results were insensitive to changes in data frequency and different oil price specification.

Gatot and Huruta (2018) focus on macroeconomic policy and public policy, especially causality between two variables: inflation and money supply in Indonesia. The study used Indonesian macroeconomic data of inflation and money supply from the Bank of Indonesia publication during 2007 – 2017. Methodically, this study used the Granger Causality model to determine the causality between inflation and money supply. The results showed that there is a one-way causality between inflation and money supply in Indonesia. These findings implied that money supply causes inflation, but not vice versa.

De (2017) studied the impact of monetary policy on the distribution of food consumption in India, mainly focusing on the subsistence food consumption of poor households and inequality, using household survey data from 1996: Q1 to 2013: Q4. Factor-Augmented Vector Auto Regression (FAVAR) results showed that an expansionary monetary policy shock increases the relative food prices, reduces the subsistence food consumption of poor households, and raises inequality across households in food consumption. This paper provided evidence of the impact of a "food price channel" of monetary policy on poor households in India.

Yolanda (2017) analyzed the factors affecting Inflation and its impact on human development Index (HDI) and poverty in Indonesia for the period 1997 to 2016 using multiple regression analysis. The results of this study showed that the variables, BI rate, money supply, oil price and gold prices, have a positive and significant partial effect on the level of inflation, while the exchange rate variable does not affect the rate of inflation. Inflation on HDI was significant and positive, and inflation on poverty was significant and positive.

Rafiq and Law (2016) examined the dynamic linkages between consumer price, producer price, industrial production, and import price indices in Malaysia using monthly data from 2005 to 2013. the Johansen multivariate cointegration test was used and the empirical results revealed a long-run relationship among the variables. The long-run estimations indicated that industrial production and import prices are statistically significant determinants of the consumer price index, which indicates that Malaysian inflation is due to demand-pull and international transmission, or imported inflation in the long run.

Ibrahim (2015) analyzed the relations between food and oil prices for Malaysia from 1971-2012 using a nonlinear autoregressive distributed lags (NARDL) model. The study found a significant relation between oil price increases and food price in the long run. There was no long-run relation between oil price reduction and food price. Furthermore, in the short run, only changes in the positive oil price significantly influence food price inflation. With the absence of significant influence of oil price reduction on the food price both in the long-run and in the short run, the role of market power in shaping the behaviour of Malaysia's food price is likely to be significant.

### **Evidence from Nigeria**

Adekunle, Akinbode, Shittu and Mommoh (2020) examined the welfare effects of price changes over categories of farm households in Nigeria between 2010–2016 using Estimated Compensating Variation. The study revealed that cereal was identified as food for which the households were most vulnerable to price shocks and when adjustments were allowed, households could adapt their consumption and production patterns resulting in lower welfare deterioration with significant differences across quintiles.

Bala and Muhammed (2019) examined the interconnecting relationship between oil price, exchange rate and food prices in Nigeria. The study applied annual time series data from 1972 to 2016. Autoregressive Distributed Lag (ARDL) techniques were used in the process of estimating the model. The main results disclosed that there is a long-run association among the considered variables. The error correction term indicates a significant negative sign. Among the two independent variables in the model, the exchange rate affects food price more than the oil price counterpart since some of the food items are imported.

Charles, Abada, Jonathan, Josaphat Urame, and Okoro (2018) examined the effects of interest and inflation rates (proxy - consumer price index) on consumer spending from 1981-2011 using the granger causality test. The findings revealed that inflation rate (measured with CPI) has a significant effect on consumer spending while interest rate is statistically insignificant. The results on the granger causality indicated that future interest and inflation rates could not be predicted using PCE.

Egwuma, Ojeleye and Adeola (2017) examined the relationship between food price inflation and critical demand and supply variables from 1988 to 2017. Cointegration and error correction modelling framework was used to determine the short and long-run dynamics of food inflation. The empirical results suggest that there is a positive long run relationship among the variables (real GDP, food import, and crude oil price) and food price inflation. Also, real GDP and food import were identified as the critical determinants of food price inflation.

### **Methodology**

#### **Data**

Data for this study was obtained from World Development Index (WDI) (2019) and CBN statistical bulletin (2019). Annual time series data is employed for the study using 30 years from 1989 to 2019. The data in the table below shows the annual data for Food inflation (CPI), and Interest rate (INT) obtained from WDI (2019) and Food imports (FIM), an Exchange rate (EXR) and Money supply (M2) obtained from CBN statistical bulletin, (2019).

#### **Model specification**

$$Y = f(x)$$

$$CPI = f(FIM, EXR, MSY, INT)$$

**LAWAL ESTHER. O. & ONYIMA NNENNA. N.**  
**DETERMINANTS OF FOOD INFLATION IN NIGERIA**

The model can be written explicitly as;

$$CPI = \beta_0 + \beta_1 FIM + \beta_2 EXR + \beta_3 MSY + \beta_4 INT + \mu_t$$

**Where:**

$\beta_0$ = Intercept;  $\beta_1$  to  $\beta_4$  are Parameters to be estimated ;  $\mu_t$  = Error Term, with  $t$  time series

FIM = Food import

EXR = Exchange rate

MSY = Money supply

INT = Interest rate

Due to the high values of some of the variables; food import and money supply (their values are in billions), they would be logged to prevent spurious outcomes.

$$\Delta CPI = \beta_0 + \beta_1 CPI_{t-1} + \beta_2 LFIM_{t-1} + \beta_3 EXR_{t-1} + \beta_4 LMSY_{t-1} + \beta_5 INT_{t-1} + \sum_{i=1}^p \alpha_1 \Delta CPI_{t-1} - \sum_{i=0}^q \alpha_2 \Delta LFIM_{t-1} - \sum_{i=0}^r \alpha_3 \Delta EXR_{t-1} + \sum_{i=0}^s \alpha_4 \Delta LMSY_{t-1} + \sum_{i=0}^b \alpha_5 \Delta INT_{t-1} + \epsilon_t$$

**Where;**

CPI is consumer price index representing food inflation

LFIM is the log form of food imports

LMSY is the logged form of money supply

$\beta_1$ -  $\beta_5$  represents the long run parameter to be estimated

$\alpha_1$ - $\alpha_5$  represent the short run parameter to be estimated

$p, q, r, s$  and  $b$  represent the lag lengths to be determined.

**Results**

The descriptive statistics of the empirical data employed in this study are shown below. These statistics provide information about the variables concerning the mean, median, maximum and minimum values, standard deviations, skewness, kurtosis, Jarque-Berra, probability, sum and sum of square deviations.

**Table 4.1: Summary Statistics**

	CPI	FIM	EXR	MSY	INT
<b>Mean</b>	61.43816	6.405489	94.25879	6.647079	0.307633
<b>Median</b>	29.60073	6.892664	102.1052	6.778167	4.310292
<b>Maximum</b>	267.5115	9.925737	306.9206	10.44149	18.18000
<b>Minimum</b>	0.489360	1.789022	0.610025	2.672158	-65.85715
<b>Std. Dev.</b>	73.00007	2.638887	92.86517	2.597957	14.60655
<b>Skewness</b>	1.301195	-0.471249	0.806529	-0.119686	-2.633592
<b>Kurtosis</b>	3.777908	1.815862	2.846207	1.593014	12.25136
<b>Observations</b>	39	39	39	39	39

The descriptive statistics show the statistical properties of the model and each of the variables. When the mean value is greater than the standard deviation value, a small coefficient of variation is possible. Likewise, when the mean value is smaller than the standard deviation value, there is the likelihood of a large coefficient of variation. From tables 4.1b, the variables (FIM, EXR and MSY) have their mean values greater than the standard deviation values indicating the likelihood of a smaller coefficient of variation. In contrast, CPI and INT have their mean values less than the standard deviation values indicating the likelihood of a smaller coefficient of variation. The skewness of a normal distribution is zero, and a positive skewness indicates that the distribution has a long right tail and a negative skewness indicates that the distribution has a long-left tail. From the tables above, the

variables CPI and EXR have long right tails while FIM, MSY and INT have long left tails (negative). Kurtosis measures the peakedness or flatness of the distribution of the series. If the kurtosis exceeds 3, the distribution is peaked (leptokurtic) relative to the normal; if the kurtosis is less than 3, the distribution is flat (platykurtic) relative to the normal. From the tables above, CPI and INT are greater than 3, meaning that they are peaked, whereas the remaining variables (FIM, EXR and MSY) have a kurtosis less than 3; hence they are flat and short-tailed.

The study applied the Augmented Dickey-Fuller (ADF) unit root test on the variables, and the lag length chose automatically based on Schwarz Information Criterion. A unit root test is carried out to determine if the variables are stationary. The Augmented Dickey-Fuller test was carried out at a 5% level of significance to ensure the verifiability of the variables stationary. Augmented Dickey-Fuller test statistic is greater than the critical value showed that the variable is stationary at the respective difference.

**Table 4.2: Representation of the Augmented Dickey-Fuller test result**

Variables	ADF @ Level		ADF @ First differences		Order of Integration	Remarks
	t-statistics	Probability	t-statistics	Probability		
CPI	-1.476157	0.5321	-3.565632	0.0117*	I(1)	Significant
FIM	-0.909179	0.7741	-6.952035	0.0000*	I(1)	Significant
EXR	1.393597	0.9986	-4.263488	0.0018*	I(1)	Significant
MSY	-0.523959	0.8753	-3.813405	0.0061*	I(1)	Significant
INT	-7.475615	0.0000*	-9.588901	0.0000*	I(0)	Significant

Table 4.2 above shows that the variables FIM, EXR, MSY have no unit root. They are stationary at first difference while the variable INT has a unit root meaning they are stationary at levels. The results were obtained from E-views statistical software 10. From the table, the absolute value of t-statistics for LOGCPI (-3.57) is greater than the t-statistics of the critical value, and also the probability (0.0117) is less than 1%.

The absolute value of t-statistics for LOGFIM (-6.952) is greater than the t-statistics of the critical value, and also the probability of 0.0000 is less than 1%, 5% and 10%. Also, the absolute value of t-statistics for EXR (-4.26) is greater than the t-statistics of the critical value, and also the probability of 0.0018 is less than 1%, 5% and 10%.

In addition, the absolute value of t-statistics for LOGMSY (-3.81) is greater than the t-statistics of the critical value, and the probability of 0.0061 is less than 1%, 5% and 10%. The absolute value of INT, which has an absolute value of t-statistics (-7.47) that is greater than the t-statistics of the critical value and also the probability 0.0000 is less than 1%, 5% and 10%. Thus, with the results, accept  $H_1$  and reject  $H_0$  indicating the variables are now stationary at both levels and first differences. Some variables (CPI, FIM, EXR, MSY) are stationary at first difference while the variable (INT) is stationary at levels which made it impossible for the application of Ordinary Least Square (OLS) and leading to the application of Bound test to test for a long-run relationship. The bounds test indicates the absence of cointegration and thus the Vector Autoregressive (VAR) model was applied.

#### 4.3 VECTOR AUTOREGRESSION ESTIMATES

	LCPI	LFIM	EXR	LMSY	INT
LCPI(-1)	1.281604*	0.965374	3.387284	-0.291608	-15.68905
	(0.19612)	(0.68552)	(35.5013)	(0.21356)	(18.8729)
	[ 6.53487]	[ 1.40823]	[ 0.09541]	[-1.36544]	[-0.83130]

**LAWAL ESTHER. O. & ONYIMA NNENNA. N.**  
**DETERMINANTS OF FOOD INFLATION IN NIGERIA**

LCPI(-2)	-0.462414** (0.20002) [-2.31182]	-0.144493 (0.69917) [-0.20666]	-11.59390 (36.2079) [-0.32020]	0.309181 (0.21781) [ 1.41947]	18.93400 (19.2485) [ 0.98366]
LFIM(-1)	0.103515 (0.07031) [ 1.47219]	0.321695 (0.24578) [ 1.30888]	-0.885430 (12.7282) [-0.06956]	0.134016 (0.07657) [ 1.75028]	-1.151739 (6.76648) [-0.17021]
LFIM(-2)	-0.005747 (0.07026) [-0.08179]	-0.056139 (0.24559) [-0.22859]	9.917845 (12.7187) [ 0.77979]	-0.031556 (0.07651) [-0.41244]	0.270691 (6.76139) [ 0.04003]
EXR(-1)	0.000930 (0.00102) [ 0.91530]	-0.003263 (0.00355) [-0.91850]	1.167873* (0.18397) [ 6.34823]	7.23E-05 (0.00111) [ 0.06530]	-0.105646 (0.09780) [-1.08022]
EXR(-2)	-0.000564 (0.00117) [-0.48211]	0.002396 (0.00409) [ 0.58563]	-0.276781 (0.21189) [-1.30624]	0.001009 (0.00127) [ 0.79180]	0.079655 (0.11264) [ 0.70713]
LMSY(-1)	0.333172*** (0.18314) [ 1.81920]	0.620544 (0.64016) [ 0.96935]	-9.475680 (33.1524) [-0.28582]	1.253334* (0.19943) [ 6.28449]	-17.70297 (17.6242) [-1.00447]
LMSY(-2)	-0.317964 (0.16373) [-1.94203]	-0.494239 (0.57230) [-0.86360]	10.12577 (29.6380) [ 0.34165]	-0.413239** (0.17829) [-2.31777]	18.11749 (15.7559) [ 1.14989]
INT(-1)	-0.000942 (0.00274) [-0.34444]	5.22E-05 (0.00956) [ 0.00546]	0.320416 (0.49514) [ 0.64712]	-7.18E-07 (0.00298) [-0.00024]	0.086866 (0.26322) [ 0.33001]
INT(-2)	0.000959 (0.00154) [ 0.62367]	0.001537 (0.00538) [ 0.28593]	0.348177 (0.27846) [ 1.25036]	0.000789 (0.00168) [ 0.47110]	0.035954 (0.14803) [ 0.24288]
C	-0.213593 (0.18847) [-1.13331]	1.655251** (0.65878) [ 2.51259]	-21.20843 (34.1166) [-0.62164]	0.435434** (0.20523) [ 2.12165]	5.422454 (18.1368) [ 0.29898]
R-squared	0.998101	0.986876	0.973609	0.998681	0.353806
Adj. R-squared	0.997370	0.981829	0.963459	0.998174	0.105270
F-statistic	1366.409	195.5166	95.91922	1968.479	1.423562
Akaike AIC	-1.568553	0.934374	8.828666	-1.398117	7.564980

Where \*\*\* represents 10% level of significance (0.10), \*\* represents 5% level of significance (0.05) and \* represents 1% level of significance.

### Discussion of VAR results

The one lag period of CPI has a positive relationship with CPI and is statistically significant at 1.281604. This means that a 1% increase (or decrease) in CPI from the previous year would lead to a 1.28% increase (or decrease) in CPI of the current year. The CPI coefficient at lag 2 has a negative relationship with CPI at -0.462414. This means that a 1% increase in CPI from two years ago would lead to a 0.46% decrease in CPI of the current year and vice versa. It is statistically significant at lag 2.



The Food Import (FIM) coefficient at lag 1 has a positive relationship with CPI at 0.103515. This means that a 1% increase in FIM from the previous year would lead to a 0.10% increase in CPI and vice versa. It is not statistically significant at lag 1. The food import coefficient at lag 2 has a negative relationship with CPI at -0.005747. This means that a 1% increase in food import from two years ago will lead to a 0.005% decrease in the current year CPI and vice versa. It is also not statistically significant at lag 2.

The exchange rate (EXR) at lag 1 has a positive relationship with CPI at 0.000930. This means that a 1% increase (or decrease) in the previous year's exchange rate would cause a 0.0009% increase (or decrease) in the current year CPI. At lag 2, its coefficient is -0.000564, and it shows a negative relationship between EXR and CPI. A 1% increase in EXR from two years ago will lead to a 0.00056% decrease in CPI and vice versa. There is no statistical significance. Also, the exchange rate at lag 1 has a positive relationship with the exchange rate and is statistically significant.

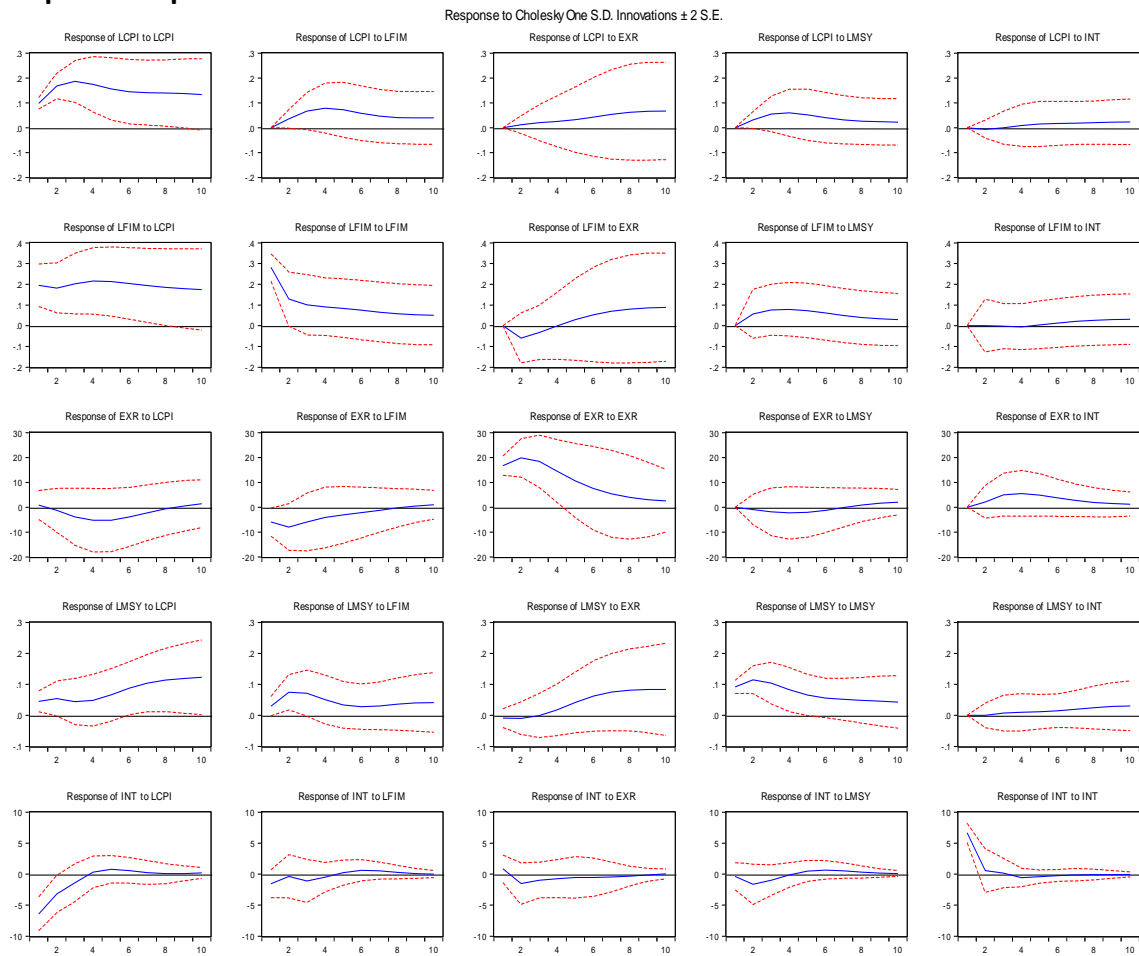
Money Supply (MSY) at lag 1 has a positive relationship with CPI and is statistically significant at 0.333172. This means that a 1% increase in the money supply from the previous year would lead to a 0.33% increase in CPI of the current year and vice versa. At lag 2, the coefficient is -0.317964, which shows there is a negative relationship between the money supply of two years ago and the current CPI. There is also no statistical significance. Also, the money supply in lag 1 has a positive relationship with money supply and is statistically significant. At lag 2, there is a negative relationship, but it is also statistically significant. The interest rate at lag 1 has a negative relationship with CPI. There is no statistical significance. At lag 2, there is a positive relationship between interest rate and CPI but no statistical significance.

The Adjusted R squared is used for multiple regression. From the regression result, the adjusted R-squared is 0.997370, which is approximately 0.997. It reveals that 99.7% of the variation in the dependent variable, Food Inflation, is explained by the independent variables- food import, exchange rate, money supply and real interest rate. The remaining 0.3% explains that other variables affect Food inflation but are not captured in the model. This, therefore, signifies that the model is fit and therefore valid.

The value of the F-statistic is depicted as 3511.848, with the probability of the F-statistic as 0.000000. This indicates that the model is statistically significant given that its probability value is less than 0.05 level of significance. This implies that all the variables taken together jointly explain variations in the dependent variable.

**LAWAL ESTHER. O. & ONYIMA NNENNA. N.**  
**DETERMINANTS OF FOOD INFLATION IN NIGERIA**

**Impulse Response**



**LCPI to LFIM:** A steady rise was observed after one standard division shock from the first period. It slowly drops at period four but shocks still remain positive.

**LCPI to EXR:** There is a gradual and positive rise after a shock from period one till the 10<sup>th</sup> period.

**LCPI to LMSY:** CPI responded positively to shocks from money supply from period one to ten.

**LCPI to INT:** CPI responded positively to shocks from interest rate from period three to period ten.

The serial correlation test has a coefficient of 0.2966, which is greater than the 0.05 level of significance. Therefore, we accept the null hypothesis that states that there is no serial correlation in the model. Similarly the ARCH LM test indicates there is no heteroschedasticity. The Jarque-Bera statistics shows that the variables in the model are normally distributed.

The adjusted  $R^2$  checks the degree of influence, validity and fitness of the regression model. The values of adjusted R-squared as 0.997897 implies that approximately 99.8% of the changes in food inflation is explained by determinants (FIM, EXR, MSY and INT), while the remaining 0.2% are other factors affecting food inflation but were not captured in the model. Also, the F-statistics test showed that the model is significant, the other post estimation tests showed no serial correlation, there is no heteroscedasticity, and there is normality at a 5% significance level. This study aims to determine the determinants of food inflation, and this objective has been met through the tests conducted in this chapter. The

research questions have been answered, and it has been discovered that there is no long-run relationship between the determinants of food inflation and food inflation in Nigeria

### Conclusion

The study adopted the Vector Autoregressive Estimate analysis technique that concluded that food import had a positive relationship with food inflation. This means that an increase in amount of food being imported into the country could lead to an increase in the food inflation rate in the country. Money supply has a positive impact on food inflation. This implies that an increase in the amount of money in circulation in the country could lead to an increase in food inflation. Exchange rate also has a positive impact on food inflation in Nigeria meaning that an increase in the exchange rate could cause an increase in food inflation in the country. On the other hand, Interest rate has a negative impact on food inflation. This suggests that an increase in the interest rate in the country could lead to an increase in the food inflation rate in the country.

There is need to reduce money supply to reduce cash in circulation to reduce food inflation in Nigeria to ensure that food products are affordable to the general public. Since the study showed a positive relationship between food imports and food inflation, the government should encourage local production to increase exports and reduce imports to avoid dumping and ensure that food inflation is reduced, contributing to economic growth and development.

The Central Bank of Nigeria should target the Interest rate to be two digit to encourage local production in Nigeria, which reduces food inflation in Nigeria. The interest rate of more than one digit could be counter-productive and discourage investment. The exchange rate had a positive relationship with food inflation. For this reason, the federal government should create policies to reduce the exchange rate in Nigeria and ensure that supply is more than demand to reduce the exchange rate, which also reduces, food inflation.

### References

- Adekunle, C. P., Akinbode, S. O., Shittu, A. M., & Momoh, S. (2020). Food price changes and farm households' welfare in Nigeria: direct and indirect approach. *Journal of Applied Economics*, 23(1), 409-425.
- Adekunle, P. (2010). *Development Macroeconomics*. Princeton: Princeton University Press.
- Akanni, K. A. (2014). Agricultural Price Policy, Consumer Demand and Implications for Household Food Security in Nigeria. *International Journal of Food and Agricultural Economics*, 2(1), 121–132.
- Ansgar, H. B., Ingo, G. E., & Volz, U. (2012). Effects of Global Liquidity on Commodity and Food Prices. *World Development*, 44(1), 30-39.
- Ayinde, O., Aina, V., Ayinde, K., & Lukman, A. (2016). Drivers of rice price variation in Nigeria: A two-stage iterative ridge regression approach. *Journal of Agricultural Sciences, Belgrade*, 61(1), 79–92. <https://doi.org/10.2298/jas1601079a>
- Bala, U., & Muhammad, M. A. (2019). The Impacts of Oil Price and Exchange Rate on Food Prices in Nigeria. *Journal of Economics and Sustainable Development*, 10(8), 51-56.
- CBN. (2015). *Interest rates*. Retrieved from Central Bank of Nigeria: <https://www.cbn.gov.ng/out/2017/rsd/cbn%20education%20in%20economics%20series%20no.%203%20interest%20rate.pdf> (Retrieved: 20/11/2020)

**LAWAL ESTHER. O. & ONYIMA NNENNA. N.**  
**DETERMINANTS OF FOOD INFLATION IN NIGERIA**

---

- Charles, O. M., Abada, C. F., Jonathan, E. O., Josaphat, U. J., Urama, C. E., & Okoro, O. E. (2018). The Effects of Interest and Inflation Rates on Consumption Expenditure: Application of Consumer Spending Model. *International Journal of Economics and Financial Issues*, 8(2), 32-38.
- Cuma, B. (2014). Money, Inflation and Growth Relationship: The Turkish Case. *International Journal of Economics and Financial Issues*, 4(2), 309-322.
- De, K. (2017). The Food Price Channel: Effects of Monetary Policy on the Poor in India. *Economica*, 17(2), 50-59.
- Dwivedi, D. N. (2004). *Macroeconomics Theory and Policy*. New Delhi: Tata McGraw-hill Publishing Company Limited.
- Edward, S. (2003). *Macroeconomics analysis (3rd Ed.)*. UK: Harcourt Brace Jovanovich.
- Egwuma, H., Ojeleye, O., & Adeola, S. S. (2017). What determines Food price inflation: Evidence from Nigeria. *FUOYE Journal of Agriculture and Human Ecology*, 1(2), 48-61.
- Faheem, U. R., & Khan, D. (2015). The Determinants of Food Price Inflation in Pakistan: An Econometric Analysis. *Advances in Economics and Business*, 3(12), 571-576.
- Fasanya, I. O., & Olawepo, F. (2018). Determinants of food price volatility in Nigeria Figure 1. Trends of Food Price Index and the Determinants of Food Price Volatility in Nigeria. *Agricultura Tropica et Subtropica*, 51(4), 165–174.  
<https://doi.org/10.2478/ats>
- Felix, A. E., Ihuoma, C. E., & Odim, G. I. (2015). Interest Rate And Commercial Banks' Lending Operations In Nigeria: A Structural Break Analysis Using Chow Test. *Global Journal Of Social Sciences*, 15(2), 9-22.
- Food and Agriculture Organization (FAO). (2017, June 18th). *Food and Agriculture Organization, International Fund for Agricultural Development, UNICEF, World Food Programme, & WHO. The state of food security and nutrition in the world 2017: Building resilience for peace and food security*. Retrieved from Food and Agriculture Organization: <http://www.fao.org/3/ai7695e.pdf>. Accessed June 2018 (Retrieved: 30/11/2020)
- Gatot, S., & Huruta, D. A. (2018). Monetary Policy And The Causality Between Inflation And Money Supply In Indonesia. *Business: Theory And Practice*, 19(2), 80-87.
- Henna, A., Zainab, I., & Kemal, A. (2012). The Determinants of Food Prices in Pakistan. *The Lahore Journal of Economics*, 17(1), 101-128.
- Ibrahim, H. M. (2015). Oil and food prices in Malaysia: Non-linear ARDL analysis. *Agricultural and Food Economics*, 3(2), 1-14.
- Ismaya, I. B., & Donni, A. F. (2018). Determinant Of Food Inflation: The Case Of Indonesia. *Bulletin of Monetary Economics and Banking*, 21(1), 81-94.
- Kumapayi, Abiola A.; Nana, Joseph U.; Ohwofasa, B.(2012). Impact of Inflation on Monetary Policy and Economic Development in Nigerian, 1980-2010. Evidence from Empirical Data. *Asian Journal of Empirical Research*, 2, 28

- Mustafa, A. M. M., & Stvarajasingham, S. (2019). Dynamic linkages between food inflation and its volatility: Evidence from Sri Lankan economy. *Journal of Asian Finance, Economics and Business*, 6(4), 139–145. <https://doi.org/10.13106/jafeb.2019.vol6.no4.139>
- Okoye, L. U., Olokoyo, F. O., Ezeji, F. N., Okoh, J. I., & Evbuomwan, G. O. (2019). Determinants of the behaviour of inflation rate in Nigeria. *Investment Management and Financial Innovations*, 16(2), 25–36. [https://doi.org/10.21511/imfi.16\(2\).2019](https://doi.org/10.21511/imfi.16(2).2019).
- Rafiq, M., & Law, H. S. (2016). Dynamic Linkages between Price Indices and Inflation in Malaysia. *Jurnal Ekonomi Malaysia*, 50(1), 41-52.
- Uduji, Joseph I.; Okolo-Obasi, Elda N.; Asongu, S. A. (2019). *Farmers' Food Price Volatility and Nigeria's Growth Enhancement Support Scheme*. 70234, 1–24.
- Umi, Z. U., Kahlid, H., & Ghani, M. G. (2018). Food Inflation: A Study On Key Determinants And Price Transmission Processes For Malaysia. *International Journal of Business and Society*, 19(1), 117-128.
- Yolanda, Y. (2017). Analysis of Factors Affecting Inflation and its Impact on Human Development Index and Poverty in Indonesia. *European Research Studies Journal*, 4(2), 38-56.