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Monetary Policy and Food Security: The Nigeria's Experience

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Abstract

The Nigerian food crisis has gained national attention, and there are differing views on whether the Central Bank of Nigeria can successfully address rising food prices through monetary policy interventions. As a result, the study examines the effect of monetary policy on food security problems in Nigeria from 1986 to 2024. Pertinent secondary data were obtained from the World Development Indicator (WDI), the National Bureau of Statistics (NBS), and CBN Statistical Bullion. The data's stationary qualities were established using the Kwaitkowski-Philips-Schmidt-Shin (KPSS) unit root test, and the effects of the variables were estimated using the Autoregressive Distributed Lag (ARDL)/Bound cointegration test methods of analysis. The F-statistic value of 7.89 was found to be higher than the critical upper bound value of 3.21 at the 5 % level of significance, thus indicating a long-term effect of monetary policy indices on food security. Federal government recurrent expenditure on agriculture and broad money supply had statistically significant effect on food security, while exchange rate, Interest rate and monetary policy rate, treasury bill rate and agricultural credit guarantee scheme fund had insignificant effect on food security in Nigeria. The study among others, recommends a deliberate policy of strengthening the exchange rate of the naira against other currencies as well proper management of funds under the agricultural credit guarantee scheme towards its intended purpose.

Keywords: Food Security, Monetary Policy, Central Bank, Food Production.

1.0 INTRODUCTION

Food security concerns occupy the main thrust in global economic discourse. The food crisis in Nigeria is increasingly becoming a time bomb. This is part of the global food crisis be-devilling the world as evidenced in the increasing food prices that are being experienced in different part of the world. In 2008, an estimated 902 million individuals in poor nations suffered from malnutrition, while between 2014 and 2016, an estimated 795 million people worldwide suffered from under nutrition (Makombe, 2023). According to a 2018 survey, approximately 1 billion people worldwide are thought to be chronically hungry (McCarthy, Uysal, Badia-Melis, Mercier, O'Donnell, & Ktenioudaki, 2018).

The worst food crisis in 40 years is currently plaguing nations including South Sudan, Somalia, Ethiopia, Nigeria, and Kenya, according to Akin (2024). According to the data available, 20% of children in underdeveloped nations suffer from malnutrition, and poor

nutrition is linked to half of all child fatalities globally (Ashley 2016; McCarthy et al. 2018). Around 26.5 million people in Nigeria are likely to face severe food insecurity, according to the FAO (2023) report.

The worsening food crisis in Nigeria is the resultant skyrocketing food prices in different part of the country which has put food beyond the reach of many Nigerians. Food inflation is part of the general inflationary trend in the country and has pushed a large proportion of households into grave situations of hunger and malnutrition. As at January 2024, Nigeria's food inflation surged to 35.41% from 33.9% in December 2023. The figure rose to 39.53% in July 2024 which has put significant pressure on especially low- and middle-income households who spend a large proportion of their income on food (Trading Economics, 2024). Available statistics revealed that 71% of household in Nigeria are affected by food insecurity. Worst still, the national average of the cost of a Healthy Diet (CoHD), used as a measure of physical and economic access to healthy diets was reported at ₦1,346 (NBS, 2024), which has impaired accessibility and affordability of food, thus forcing many to consume whatever food they have access to regardless of its quality or safety, thus exacerbating food insecurity.

Besides the challenges brought about by conflict between farmers and herders and other forms of insecurity which has hindered food production, climate variability and extremes, particularly the erratic and unpredictable rainfall are key drivers of the recent rise in global hunger. In addition, farmers' poor access to agricultural inputs; coupled with the consequence of fuel subsidy removal have all heightened the food security dilemma in Nigeria. In particular, the fuel subsidy removal has significantly raised the cost of transporting food, making it more expensive and less accessible to consumers (Olorunmola, Eggon, Ajidani, Ibbih & Odonye, 2024).

Over the years the government has formulated different agricultural programmes and projects ranging from National Accelerated Food Production Programme (NAFPP) launched in 1973; the Agricultural Development Projects (ADPS) established in 1974; the Operation Feed the Nation (OFN) which was initiated 1976; the Green Revolution of 1980; the Nigerian Agricultural Insurance Scheme-NAIS (1987); the National Fadama Development Project-NFDP (1992); National Special Program on Food Security-NSPFS (2002); Root and Tuber Expansion Programme (2003); National Economic Empowerment and Development Strategy-NEEDS (2004); and more recently, the Anchor Borrower's Programme (ABP) launched in 2015 were targeted at ensuring food security of the nation through improved seedlings, subsidizing of agricultural inputs as well as supporting farmers with funds for agricultural purpose (Amakom, Madukwe & Dimelu, 2020). These programmes recorded varying degree of success; notwithstanding, food security still remains a daunting challenge to the Nigeria state.

Monetary policy instruments have over the years proven to be an important mechanism through which economic ills such as food security can be handled. As a tool for managing money supply and interest rates, monetary policy have the potential to impact various sectors of the economy, including agriculture (Ameji, Elisha, Adofu, & Gimba, 2023). For instance, using the Agricultural Credit Guarantee Scheme Fund (ACGSF) where

direct credit is made available to the agricultural sector through loans, notes, bill of exchange and bankers' acceptances, monetary policy is a potential instrument for growth

in most agriculture-based countries (Yusufu & Ogboru, 2018). In the same vein, Adepoju and Obayelu, (2013) opined that monetary policy is strategic in shaping macroeconomic conditions that influence food security outcomes. Interest rate adjustments, money supply management, and exchange rate policies can impact agriculture through various channels. Lower interest rates may boost investment in agriculture by increasing access to credit for inputs and machinery (Jayne, Mather & Mghenyi 2010). In specific term, short and intermediate term credits can be used for obtaining farm inputs such as fertilizer, improved seeds, breeding livestock and farm machinery to enhance better yields of farm produce. Similarly, lower interest rate for farmers can encourage borrowing for agricultural purposes, all tailored towards increased output.

In Nigeria, the main goal of monetary policy is price stability (Ogwuche, 2021). However, food crises, which show up as a high rate of food inflation, continue to pose a serious threat to Nigeria's economic growth despite the Central Bank of Nigeria's adoption of several monetary regimes over the years. This study investigates the degree to which Nigeria's food security issue has been addressed by monetary policy reform.

2.0 LITERATURE REVIEW

2.1 Conceptual Review

The notion of food security has drawn the interest of various groups, each of which has a different conceptualisation of the topic. There are numerous definitions of food security as a result of its multifaceted character. From a food-first to a livelihood viewpoint; from objective indicators to subjective perception; and from the global and national to the household and individual, these definitions represent three paradigm shifts in the thought surrounding food security. Economists typically view food security as a supply and demand relationship that is closely linked to transfers and income growth (Makombe, 2024). However, the widely acceptable definition of food security states that: "Food security, is achieved when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (Makombe, 2024:56).

The Food and Agriculture Organisation (FAO) formally adopted and reaffirmed this definition in the 2009 Declaration of the World Summit on Food Security, which conceptualised food security at the macro (community, national, regional, and global) and meso (household and community) levels (Clapp, Moseley, Burlingame, & Termine, 2022); Makombe, 2024). Notably, four interconnected pillars of food security have been highlighted by researchers including McCarthy et al. (2018), Bertelli 2020, Clapp et al. 2022, and Makombe 2024: availability, access, utilisation, and stability. Food access is concerned with the resources needed to obtain the right foods for a healthy diet, whereas the availability component deals with the amount and quality of food provided through imports, food assistance, or domestic production. In order to achieve a state of nutritional wellbeing and satisfy all physiological needs, utilisation entails having sufficient diet, clean water, sanitary conditions, and medical treatment. Stability requires that a

population, home, or individual must always have adequate availability to food without running the risk of losing it due to unforeseen shocks.

In general, monetary policy refers to the precise actions taken by the central bank to control the cost, supply, and value of money in an economy with the ultimate goal of accomplishing the macroeconomic goals of the government. These goals include maintaining price stability, achieving balance of payments equilibrium, creating jobs and promoting economic growth (Iriabije, Ekong & Orebiyi, 2024).

The majority of monetary authorities begin by focusing on overall inflation, but measures of "core" inflation—which do not include the impact of food prices—often influence their policy choices since they provide a more accurate picture of underlying price trends. Iddrisu and Alagidede (2020) have brought up the crucial question of whether rising food costs influence central bankers' stances. According to this reasoning, central bankers have little control over the effects of food prices since they are short-lived, subject to supply-side shocks, and exhibit extreme volatility (Alper, Hobdari, & Uppal, 2017; Anand, Prasad, & Zhang, 2015). The empirical literature also raises the counterargument that demand-side variables like income can potentially affect rising food prices; thus aggregate demand moderation (within central bank jurisdiction) can be an effective remedy (Nadani, Usman, Yaro, & Asooso, 2023).

The effect of monetary policy on food security is shown in Figure 1. The actions of the CBN through the monetary policy indicators such as the exchange rate, money supply, monetary policy rate, interest rate, agricultural credit guarantee scheme funds as well as the federal government recurrent expenditure on agricultural are directly related to food security issues in the country. The monetary policy indicators are targeted at controlling the price of food by creating a framework for increased food production. It is expected that increase in food production will manifest in lower prices of food thus ensuring accessibility, availability, affordability and stability which are the core of food security.

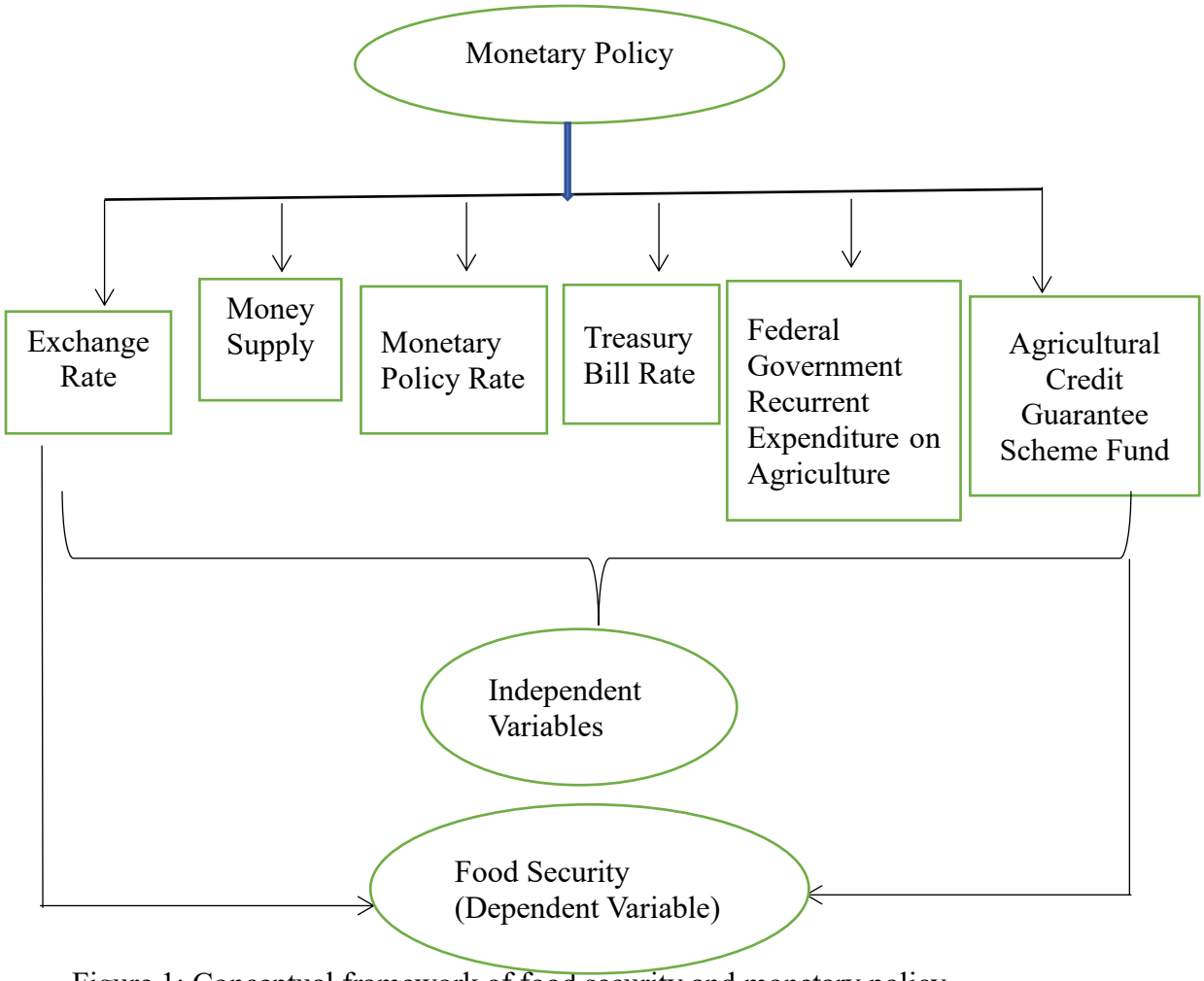

Figure 1: Conceptual framework of food security and monetary policy
Source: Author's conception (2025)

In Figure 1, food security which is the dependent variable is the primary variable of interest in this study. It is a reflection of the physical and economic access to sufficient, safe and nutritious food to meet their dietary needs of the populace. Food security is measured in this study as food inflation. This establishes a channel of the effect of monetary policy food security.

2.2 Theoretical Review

From a theoretical perspective, monetary theory investigates how money and economic activity are related. It looks for and explains how the supply and demand of money affects output, income, employment, interest rates, and prices (Ajudua, Ojima, & Osmond, 2015). Irving Fisher's quantity theory of money provides a fundamental theoretical justification for the connection between money and the overall level of prices. The hypothesis proposed that, with other factors staying the same, when the amount of money in circulation rises, the price level likewise rises in direct proportion to the decline in the value of money. According to Ajudua, Ojima, and Osmond (2015), doubling the amount

of money will likewise double the price level and cut the value of money in half. According to Ezeanyeji, Obi, Imoagwu, and Ejefobihi (2021), the quantity theory of money equation changed to the classical quantity theory of money with the idea that the money stock and the price level are proportionate. As a result, it can be thought of as a theory of price determination that holds that the amount of money is strictly proportional to the equilibrium price level.

2.3 Theoretical Framework

The Fisher's (1911) quantity theory of money, asserts that any alterations in money supply will result in a corresponding change in general price level. The theory posits that price of goods and services will be directly proportional to the quantity of money in circulation. This implies that when the federal government and financial institutions give out grants and loans to farmers, it will boost food production in the country thereby forcing the prices of food stuffs to fall vice-versa; hence ensuring food security. Summarily, the theory postulated that the quantity of money supply to farmers determines the cost of food stuff in the market. This theory of money finds its roots in the well-known identity that serves as its starting point.

$$MV=PY \quad (1)$$

Where: M = money supply, V = velocity of money in circulation, Y = real national output, and P = aggregate price level. From equation (1), another equation can be as follows:

$$P=MV/Y \text{ or } V=PY/M \quad (2)$$

Equation 2 illustrates the existence of a direct proportional relationship between the general price level of goods and services, and money supply, assuming velocity and output remain constant. This proportionality relationship implies that any permanent increase in money supply will inevitably result in an equal increase in the prices of goods and services, thus affecting the general price level. The Fisher's effect justifies the long-term relationship between monetary policy and price stability.

2.4 Empirical Review

Chileya, Kawimbe, Saidi, and Muya (2024) used the ARDL and ECM regression approaches to empirically evaluate the relationship between Zambia's food inflation and monetary policy from 2016 to 2023. The results showed a strong correlation between food inflation and monetary policy measures. In particular, there was a destabilising correlation between food inflation and the monetary policy rate and the expansion of the broad money. Additionally, food inflation increased as a result of exchange rate depreciation. The need for a stern policy action to reduce the inflationary pressure from depreciating exchange rates was recommended.

Ukpe, Djomo, Olayiwola, and Osayi (2020) used the food production index, a measure of food security in Nigeria from 1985 to 2016, to examine how fiscal and monetary policies affected food security. The results of the Vector Error Correction Model (VECM) analysis showed that only government spending had a significant positive impact on the food production index in the short term. In the long term, however, the exchange rate had

a positive impact on the food production index while government spending on agriculture, inflation, and interest rates had a negative impact. The study advocated increased budgetary allocation to agriculture in line with the Maputo agreement.

Using commercial banks' loans to the agricultural sector (CBLA), federal government recurrent expenditure on agriculture (FGRE), and the agricultural credit guarantee scheme fund (ACGSF) as explanatory variables and the agricultural contribution to GDP as the dependent variable, Yusufu and Ogboru (2018) conducted a comparative study of the effects of credit and government spending on agricultural output in Nigeria from 1981 to 2016. ACGSF significantly impacted agricultural output and, consequently, food security in Nigeria, whereas CBLA and FGRE had no discernible effect on agricultural output, according to the results of the two-stage least squares regression approaches used. Reducing the bureaucracy involved in accessing the ACGSF so as to enhance and sustain access to the funds was recommended.

Ajudua, Ojima, and Osmond (2015) investigated the relationship between monetary policy variables and agricultural sector output from 1986 to 2013 in order to determine how monetary policy affected food security in Nigeria. Nigerian agriculture sector performance indicators and monetary policy indicators were revealed to have a substantial long-term association using the ordinary least square (OLS) regression technique. More specifically, when the money supply increased, agricultural output increased, but when interest rates and monetary policy rates increased, agricultural output decreased. The study recommended effective utilization of funds allocated to the agricultural sector.

3.0 METHODOLOGY

This paper utilized secondary data sourced from the CBN Statistical Bullentin, the National Bureau of Statistics (NBS) and the World Development Indicator (WDI). Data were obtained on food inflation, Monetary Policy Rate (MPR), Interest Rate (INTR), Broad Money Supply (M2), agricultural loan under the Agricultural Credit Guarantee

Scheme (AGCGS), Treasury Bill Rate (TBR) and Exchange Rate (EXR) spanning from 1986 to 2023. 1986 as the base year is deliberately chosen to explore how monetary policy has fared from the era of the structural adjustment programme (SAP) while the terminal year (2024) is to ensure that the work addresses current realities regarding food security. The causal research design was adopted to analyzed how monetary policy indicators impact on food security indicator.

3.1 Model Specification

Following the theoretical framework in section 2, and adapting the empirical work of Ameji, Elisha, Adofu and Gimba, (2023); variables namely; Food Inflation (FINF) as proxy for food security (dependent variable); Broad Money (M2) as proxy for money supply, prime lending rate of banks (INTR), Exchange Rate (EXCR), Monetary Policy Rate (MPR), Treasury Bill Rate (TBR), Federal Government Recurrent Expenditure on Agriculture (FGREA) and agricultural financing through the Agricultural Credit

Guarantee Scheme Fund (ACGSF) as independent variables were employed. The model is functionally specified as:

FINF= f (M2, INTR, EXCR, MPR, TBR, FGREA, ACGSF)

Econometrically, the model is stated as:

$FINF = \delta_0 + \delta_1 InM2 + \delta_2 INTRt + \delta_3 InEXCR + \delta_4 MPR + \delta_5 TBR + \delta_6 FGREA + \delta_7 ACGSF + \varepsilon t$ (10)

Where δ_0 is the intercept or autonomous parameter estimates for monetary policy; and, δ_1 to δ_7 are the coefficients of the independent variables, εt represents the error term and *In* is the natural logarithm notation.

On a priori expectation, the coefficients are symbolized as: INTR, MPR, FGREA, ACGSF >0; M2, EXCR, TBR<0

3.2 RESULTS AND DISCUSSION

Descriptive Statistics

To get a precise idea of the data employed in the study, a descriptive statistics was used to provide an informative summary of the data in terms of the mean, standard deviation as well as the minimum and maximum values. This is presented in Table 1.

Table 1: Descriptive Statistics

Variables	Mean	Maximum	Minimum	Std. Dev.
FINF	20.04130	76.75887	0.223606	17.31936
EXR	188.5598	1657.110	3.316600	282.4234
INTR	17.99803	29.80000	10.50000	3.969486
M2	14427.20	107200.5	27.38980	23037.09
MPR	14.23077	26.75000	6.000000	4.240463
TBR	14.29094	26.90000	4.500000	4.510569
FGREA	28.92899	110.2500	0.020000	30.46167
ACGSF	7081693.01	129000000	68417.40	20431230

Source: Authors Computation using E-views 12 (2024)

The descriptive statistics in Table 1 indicated that Food Inflation (FINF) from 1986–2024 had maximum and minimum values of 76.67% and 0.22% respectively. With a standard deviation of 17.32% and an average rate of 20.04% for the period, the data indicated a 2.72% divergence from both sides of the mean which implies consistency and absence of outliers in the data set. This suggests that the food inflation rate in Nigeria was fairly evenly distributed during the study period, resulting in a marginal variation in FINF rate that might be linked to Nigeria's current food security challenge. Exchange Rate (EXR) had minimum and maximum values of 3.32 and 1657.110 respectively, for the period which indicates the continuous depreciation the Naira over the years. The EXR average was 188.56, with a standard deviation of 282.42 meaning that there was a 93.86 point departure from both sides of the mean. Given that the standard deviation was found to be higher than the mean value, this implies a substantial fluctuation in the data set over the sample period which further confirms the continuous depreciation of the exchange rate, thus, a scenario of increased uncertainty in

prediction of the exchange rate. With a magnitude of 14.03%, Prime Lending Rate (INTR) is widely spread from the mean, as indicated by its minimum and maximum values of 10.5% and 29.8%, respectively, and its mean value and standard deviation of 17.99% and 3.97%, in that order indicating a measure of consistency in the data set. Also, Broad Money Supply (M2) had maximum and minimum values of 107200.0 and 27.39 respectively. With a standard deviation of 23037.09 and an average value of 14427.20 for the period, the data indicated a significant 8609.89 divergence from both sides of the mean which implies that M2 is not normally spread over the years. Monetary Policy Rate (MPR) is relatively spread from the mean, as indicated by its maximum and minimum values of 26.75% and 6.00% respectively, and its mean value and standard deviation of 14.23% and 4.24% respectively. Treasury Bill Rate (TBR) ranged from 4.50% at the minimum to 26.90% at the maximum. Throughout the period, the average TBR was 14.29%, with a standard deviation of 4.51%, meaning that the data varied by 9.78% from the mean value. The fact that the standard deviation was less than the mean value suggests consistency in TBR during the study period. In addition, FGREA had maximum and minimum values of 110.2500 and 0.02 respectively. With a standard deviation of 30.46 and an average rate of 28.93 for the period, the data indicated a 1.53 divergence from both sides of the mean which implies consistency and absence of outliers in the data set. Finally, ACGSF is widely spread from the mean, as indicated by its maximum and minimum values of 129000000 and 68417.40 respectively, and its mean value and standard deviation of 7081693.01 and 20431230 respectively.

3.3 Unit Root Test Results

The Kwaitkowski-Philips-Schmidt-Shin (KPSS) was employed to test both the unit root and stationarity hypotheses of the data set, as it gave a better result than both the Augmented Dicky-Fuller (ADF) and Philips-Perron tests. The test was conducted at the 5% level of significance and the result is presented in Table 2.

Table 2: Kwaitkowski-Philips-Schmidt-Shin (KPSS) Test Results

Variables	At Levels	At 1st Difference	5% Critical Value	Order of Integration
FINF	0.284798	0.300495	0.463000	I(0)
EXR	0.710487	0.443337	0.463000	I(1)
INTR	0.474968	0.146073	0.463000	I(1)
M2	0.455028	0.381799	0.463000	I(0)
MPR	0.150696	0.117365	0.463000	I(0)
TBR	0.134960	0.086480	0.463000	I(0)
FGREA	0.713339	0.313281	0.463000	I(1)
ACGSF	0.589733	0.327737	0.463000	I(1)

Source: Authors Computation using E-views 12 (2024)

The KPSS test results in Table 2 indicated that when the variables were tested at levels, FINF, M2, MPR, and TBR were stationary (I(0)). After first differencing, EXR, INTR, FGREA and ACGSF were found to be stationary (I(1)). Hence the null hypothesis of no unit root (stationarity) was accepted at the 5% level of significance. With this scenario, the Johansen cointegration test is not applicable. Thus, the adoption of the Autoregresssive Distributed Lag (ARDL)/ Bounds test is justified since there are mixed

order of integration (I(0); I(1)) (Ogwuche, 2021). The ARDL/Bound test was utilized to ascertain the existence of a long run relationship among the variables. The result of the ARDL/Bound test is presented in Table 3.

Table 3: ARDL Bound Test Result

Test Statistics	Value	K
F-statistic	7.890130	7
Critical Value Bounds		
Significance	I(0) Bound	I(1) Bound
10%	1.92	2.89
5%	2.17	3.21
2.5%	2.43	3.51
1%	2.73	3.9

Source: Author's computation using E-views 12 (2024).

Table 3 revealed that the calculated F-statistic (7.89) is greater than the critical upper bound I(1) value (3.21) at the 5% level of significance, hence the conclusion that there is co-integration. Thus, the null hypothesis of no long-run relationship is rejected at the 5% level of significance. This implies that, there is long-run effect of monetary policy on food security in Nigeria within the study period. To further estimate the effect of monetary policy indicators in Nigeria, the results of the estimation of the independent variables on the dependent variables of both the short and long run dynamics are presented in Table 4.

Table 4: Long-run and Short-run Estimates of the ARDL Model

Cointegrating Form				
Variable	Coefficient	Standard Error	t-Statistics	Probability
C	35.79995	36.61349	0.977780	0.3388
FINF(-1)	-0.927326	0.143514	-6.461574	0.0000
INACGSF(-1)	-6.286774	3.481838	-1.805591	0.0847
INEXCR	0.137978	8.011290	0.017223	0.9864
INFGREA(-1)	-12.27870	4.046028	-3.034754	0.0061
INM2(-1)	12.05472	5.661203	2.129356	0.0447
INTR	-0.510033	0.695121	-0.733733	0.4709
MPR	-1.532832	0.926808	-1.653884	0.1124
TBR(-1)	1.551586	0.754826	2.055554	0.0519
D(FINF(-1))	0.563273	0.139647	4.033531	0.0006
D(INACGSF)	6.571292	5.132033	1.280446	0.2137
D(INFGREA)	-6.459500	2.999680	-2.153397	0.0425
D(INM2)	36.15975	16.66193	2.170202	0.0411
D(INM2(-1))	21.08861	18.82794	1.120070	0.2748
D(TBR)	0.024946	0.727822	0.034274	0.9730
ECM_{t-1}	-0.927326	0.094237	-9.840397	0.0000

EC = FINF - (-6.7795*INACGSF + 0.1488*INEXCR -13.2410*INFGREA + 12.9994*INM2 -0.5500*INTR -1.6530*MRP + 1.6732*TBR + 38.6055)				
Variable	Coefficient	Std. Error	t-Statistics	Probability
INACGSF	-6.779461	3.474399	-1.951262	0.0639
INEXCR	0.148791	8.648590	0.017204	0.9864
INFGREA	-13.24097	4.880221	-2.713190	0.0127
INM2	12.99943	5.504386	2.361650	0.0275
INTR	-0.550004	0.779084	-0.705962	0.4876
MPR	-1.652959	1.074615	-1.538187	0.1383
TBR	1.673182	0.875865	1.910320	0.0692
C	38.60555	37.87321	1.019336	0.3191
R-squared	0.836168			
Adjusted R-squared	0.731912			
Durbin-Watson stat	2.072762			

Source: Author's Computation, extracted from E-views 12 (2024)

The ARDL model is estimated using automatic selection of maximum lag of 2 and Akaike information criteria in selecting the optimum lag order of (2, 1, 0, 1, 2, 0, 0, 1). Table 4 presents the statistics. The short-run analysis revealed that, a 1 unit appreciation of the exchange rate enhanced food security by 13.8%. In the lagged period ACGSF negatively affected food security by 62.9% while in the present period, ACGSF rate increases food security issue by 65.7%. FGREA negatively affected food security both in the lagged and present periods by 12.3% and 6.5% respectively. M2 positively and significantly impact food security both in the lagged and present periods by 12.1% and 36.2% respectively. Also, a unit increase in prime lending rate (INTR) worsens (negatively) food security by 51%. In the same vein, a 1% change in MPR negatively impact food security by 15.3%. In addition, an expansionary open market operation as proxy by the treasury bill rate will positively affect (improve) food security by 15.5% and 2.49% in the lagged and present periods respectively. Furthermore, coefficient of error correction term (ECM_{t-1}) is -0.927326, is correctly signed and significant at 1% level; indicating that short-run

disequilibrium, is adjusted at the 92.7% every year through changes in the independent variable. The Adjusted R-squared of 0.731912 revealed that monetary policy indicators accounted for 73.19% systematic variation in food security while the error term accounts for 26.81%. This implies that the model has a good fitness. Also, the Durbin Watson statistic being approximately 2 (2.072762) indicates no autocorrelation in the model (Ezie & Ezie, 2021).

In the long run, ACGSF impacted food security negatively. Thus, a 1 % increase in the fund worsens food security by 67.8%. This is however insignificant from the p-value been 0.0639. The implication of this finding is that funds under the ACGSF has not been properly channeled to increase agricultural output over the years or that other factors such as insecurity has affected the expected outcome of the scheme. This finding is at variance with that of Yusufu and Ogboru (2018). Exchange rate was found to have a

positive relationship with food security such that a 1% appreciation of the exchange rate enhances food security by 14.9%. This is consistent with a priori expectation and corroborates the findings of Chileya, Kawimbe, Saidi, and Muya (2024). This further agrees with Akpan (2021), that the higher the exchange rate in terms of the home currency, the higher the domestic price level and invariably the higher the food insecurity incidence. A weaker currency/higher exchange rate increase the costs of imported food, particularly for a highly import dependent country such as Nigeria. This reduces food accessibility and affordability which negatively affects food security. This result is statistically insignificant as shown by the p-value 0.9864 (seen to be greater than 0.05).

The long run coefficient of FGREA had a negative effect on food security. Hence, a percentage increase in FGREA worsens food security by 13.2%; implying that FGREA has not addressed food security challenges over the years. This finding is inconsistent with a priori expectation but is in agreement with Yusufu and Ogboru (2018).

Also, broad money supply (M2) was found to have a positive and statistically significant effect on food security. This finding is in line with a priori expectation based on the quantity theory of money. Specifically, a unit increase in money supply will increase food prices, thus, straining food security by 129.9%. Increase in money supply will manifest in rise in food prices, hence food security can deteriorate. On the other hand, increase in money supply and enhance access to credit by farmers, will enable them to invest in better technology and agricultural practices that can increase food production, thereby improving food security. The work of Ajudua, Ojima and Osmond (2015) who found that money supply had a positive impact on agricultural output (food security) is consistent with this finding.

Furthermore, the coefficient of prime lending rate (INTR) was found to be negative (-0.550004) and statistically insignificant (0.4876 p-value). Specifically, a 1% increase in interest rate will worsen food security by 55% within the period under investigation; while a 1% reduction in interest will enhance food security by same percentage. For instance, an expansionary monetary policy which involves lowering interest rate is expected to stimulate investment in agriculture and food production. This can enhance food security by increasing food supply and reducing prices. The work of Ukpe, Djomo,

Olayiwola, and Osayi, (2020) who found that interest rate negatively affected food production index and food security corroborates this finding.

In addition, the result of the monetary policy rate revealed a negative relationship with food security such that a 1% increase in MPR worsens the effect of food security by 165.3%. This finding is statistically insignificant given the p-value 0.1383. Furthermore, a 1% change in expansionary open market operation on the average as captured by the coefficient of Treasury bill rate increases food security by 167.3% and this is statistically insignificant given the p-value 0.0692. This finding is consistent with the fact that an expansionary monetary policy invariably increases the volume of money in circulation and enhances affordability of food.

Table 4: Diagnostic Test Result

Test	F-statistic	Prob. Value	Obs*R-squared	Prob. Value
Breusch-Godfrey Serial Correlation LM Test:	1.178357	0.3283	3.900324	0.1423
Breusch-Pagan-Godfrey Heteroskedasticity Test:	0.559122	0.8681	9.709936	0.7831

Source: Author's Computation, extracted from E-views 12 (2024)

From Table 4, the probability values for the Breusch-Godfrey Serial Correlation LM test and the Breusch- Pagan-Godfrey Heteroskedasticity test (0.3283) and (0.8681) are respectively greater than 0.05, hence the null hypotheses of no serial correlation and heteroskedasticity are accepted.

5.0 CONCLUSION AND RECOMMENDATIONS

This study has established that monetary policy indicators have a long run effect on food security in Nigeria. Based on the finding, it concluded that monetary policy indicators under the period of investigation have not significantly address the food security challenge in Nigeria. Notable monetary policy indicators such as agricultural credit, exchange rate, interest rate, monetary policy rate and Treasury bill rate reported statistically insignificant effect on food security; while federal government recurrent expenditure on agriculture as well as broad money supply had statistically significant effect on food security in Nigeria. This suggestively implies that the monetary policy authorities have not effectively factor food security concern into its core operation. Thus, this study recommends prioritizing efforts toward the exchange rate of the naira in order to enhance food security. Also, funds allocations in the federal government recurrent expenditure on agriculture as well as the agricultural credit guarantee scheme should be properly monitored towards their intended purposes.

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