

Monetary and Fiscal Policies' Effects on Commodity Price in Nigeria

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ABSTRACT

Utilizing the data period 1990 to 2022, this empirical study is conducted to ascertain how monetary and fiscal policies in Nigeria impact on commodity price. The policy synthesis variable was defined as the product of broad money supply growth and government expenditure growth, while the commodity price index serves as the regressor. Monetary policy variables include the real interest rate and broad money supply growth, while fiscal policy variables include the federal government revenue growth and expenditure growth. The researchers empirically analysed yearly data from the Central Bank of Nigeria (CBN) statistical bulletin and the National Bureau of Statistics (NBS) reports employing the Autoregressive Distributive Lag (ARDL) approach. The results suggested that the policy mix variable, federal government expenditure growth, and broad money stock growth had substantial and negative effects on the commodity price index for the short-run and long-term. Real interest rate had substantial positive effect on the regressor in both the short-run and long-term. Federal government revenue growth had an insignificant negative influence in both the short-run and long-term. The study concluded that the policy mixes variable and the employed monetary and fiscal policies indicators are significant measures for commodity price moderation in Nigeria. Nevertheless, monetary policy exerted relatively stronger short-term and long-term effects on commodity price targeting than fiscal policy. The researchers recommended that the Central Bank of Nigeria (CBN) ensure a productive market-friendly interest rate and money stock growth to dampen commodity price inflation through the use of monetary policy rate, cash reserve ratio, and open market operations. Additionally, federal government should ensure that fiscal mobilization and allocations are directed towards creation of the necessary enablers to drive real economic activities, which in turn transmits to moderate commodity price level. The monetary and fiscal policy institutions should ensure proper synthesis in the management of their injection components to achieve welfare-friendly commodity prices in Nigeria.

Keywords: Monetary Policy, Fiscal Policy, Policy Synthesis Variable, Commodity Price Index and Autoregressive Distributive Lag (ARDL) Processes, Nigeria.

INTRODUCTION

The management of commodity prices in Nigeria is a substantial challenge that is intricately linked to economic stability and development. When it comes to setting these economic expectations, the effectiveness of policy interventions, especially monetary and fiscal policies, plays a vital role. So as to execute monetary policy, the Nigerian Apex bank makes adjustments to interest rates and the money supply. These adjustments, in turn, have an effect on the pricing of commodities. When we talk about "economic policy," we are referring to the rules and regulations that are implemented by the Apex bank of a country so as to manage the entire economy. These govern the level of money liquidity, credit cost and other relevant variables of the economy. So as to achieve certain macroeconomic objectives, monetary planners use various methods to exercise control over the amount of money in circulation (Amadi and Amadi 2014). As Thank God and Igbinovia (2022) have shown, the CBN, which is the government body responsible for monetary policy, utilizes a wide range of strategies so as to control the supply and demand of money within the economy. In congruent with Fasanya et al. (2013) and Folawewo and Osinubi (2008), the CBN, which is the top monetary authority in the nation, conducts monetary policy when it takes specific steps to regulate the wealth of the country, interest rates, and the amount of money in circulation. In congruent with Adesoye (2012), monetary policy is a collection of policies that are designed to govern the

value, supply, and cost of money in an economy. These policies are designed to be in accordance with the projected level of economic activity. It is the responsibility of the Apex bank to adopt policies that manage the money supply so as to accomplish broad macroeconomic goals i.e. full employment, stable prices, economic progress, and a balanced balance of payments (BOPs).

Conversely, the federal ministry of finance's fiscal policy has an effect on commodities prices via its manipulation of aggregate demand and supply dynamics via budgetary tools of revenue mobilization and allocation. As attested by this research, fiscal policy is the process by which a government manipulates its economy via the allocation of expenditure programs and the collection of tax and non-tax revenues. The government use this alternate set of policies to accomplish macroeconomic goals like balancing the budget, lowering unemployment, increasing growth, and managing inflation (Egbulonu & Amadi, 2016; Anyafor, 2016; Reem, 2009). All of these measures have different effects on commodity prices, as attested by the statistics. Fiscal interventions in agriculture have achieved price stabilization in the near run, as attested by data from the National Bureau of Statistics (NBS), but monetary policy tweaks have frequently failed to prevent chronic inflation, especially in commodity markets that are very volatile. For instance, the correlation analysis between MPR adjustments and food inflation rates from 2017 to 2022 indicates a moderate inverse link ($R = -0.54$), suggesting a limited but apparent influence on price stability (CBN Annual Reports, Various years).

Concurrently commodity price serves as a barometer for resource allocation and global economic health. Because of its impact on the purchasing power of consumers and its ability to shape inflationary pressure, it is of utmost significance. Therefore, when we speak about commodity pricing, we are referring to the market value of fundamental agricultural and mineral items, likewise raw materials. What drives these pricing is the interplay between supply and demand on a global scale, always having in mind the hard and soft commodity forms. Commodities may be hard in nature (i.e. gold, rubber, or oil) or soft (i.e. agricultural goods) depending on their extent of extraction from the ground. Things like cattle, sugar, cotton, and coffee are examples. Both monetary and fiscal policies in Nigeria have their own unique instruments for managing the economy and prices, and they interact in complex ways to impact commodity prices.

So as to manage economic activities and improve crucial fundamentals like growth indicators, unemployment, general price level, and external indices, fiscal and monetary policy measures work together to adjust taxes and government spending, likewise the monetary policy rate (MPR) and money supply. So, the CBN and the federal ministry of finance should work together to achieve optimal policy synthesis, which could be a better way to influence commodity price indices and overall real economic outcomes, since efforts to apply policies unilaterally have not been successful in reducing price instability.

Commodity price stability as a fundamental goal for the economic health of any economy comprising Nigeria's, is an aim at ensuring predictable pricing to preserve purchasing power of money, and foster a stable economic environment conducive to investment and growth. However, Nigeria has struggled with persistent inflation and price volatility of commodities, which undermine economic stability and growth prospects. Consequently, this has resulted in the need for crucial investigations into monetary and fiscal policy efficacy for stability in the pricing of commodities. The purpose of monetary policy is to control inflation via the use of various tools, comprising as changes in interest rates, open market operations, and reserve requirements. Regrettably, despite these steps, inflation in Nigeria persists at elevated levels. In 2020, Nigeria's inflation rate was 13.2%, which surged to 17% in 2021 and escalated to 18% in 2022. The inflation rate rose to 28.95% and 33.69% from 2023 to 2024 (WDI, 2022; NBS, 2024). This situation is partially attributable to structural problems i.e. insufficient supply and reliance on imported products. Moreover, the CBN has challenges in managing inflation due to external causes, comprising swings in global oil prices and currency rate volatility.

Furthermore, fiscal policy administered by the Nigerian government comprise the use of revenue and expenditure to affect economic activity. Expansionary fiscal measures intended to stimulate economic activity via heightened public expenditure may accidentally intensify inflation if not well coordinated with monetary policy. Austerity measures aimed at alleviating tax deficits may hinder economic development and may not effectively mitigate underlying inflationary pressures unless accompanied by robust monetary policies. Consequently, the essence of the issue is in the evident misalignment and contradictory goals of monetary and fiscal policy. Previous research by Gökhan (2023), Torutein, et al., (2021), Gbadebo et al. (2018), Babatunde et

al. (2016), and Joseph, et al., (2015) shown that monetary and fiscal policy variables had negative but substantial stabilizing consequence on prices of commodities. In contrast, Salihu (2020) and Yakubu, et al., (2013) found prices of goods and services as favorably and significantly influenced by monetary and fiscal policy variables. This indicates measures taken to expand monetary and fiscal policy indicators as exacerbating price stability in Nigeria. Otto and Ukpere (2015) concluded in a comparable analysis that fiscal policy factors had a minimal impact on price stability.

Unexpectedly, various studies conducted by Haruna et al. (2022), Ene and Kasim (2021), Duc and Thi (2021), Takon and Ita (2020), Bank-ola et al. (2020), and Joseph et al. (2015) indicated that monetary and fiscal policy variables can be substantial in certain contexts while being insignificant in others. The dynamics of their association are contradictory, since some variables are claimed to exhibit both positive and negative correlations at different periods. This study observed that the majority of previous studies focus on monetary policy concerning price stability. Only Ene and Kasim (2021) thoroughly appraised how fiscal policy guarantees price stability. With the exception of Gbadebo, et al., (2018) and Yakubu, et al., (2013), no research has appraised the impact of both monetary and fiscal policy interactions in Nigeria on commodities prices.

Hence, the current research as departure from previous ones empirically investigated how monetary and fiscal policy instruments relatively influenced commodity prices in the Nigeria's context, specifically assessing how broad money growth, actual (real) interest rates, federal government expenditure growth, federal government revenue growth, and the interaction between broad money supply and government expenditure growths on commodity prices in Nigeria.

THEORETICAL AND EMPIRICAL REVIEWS

Related Theoretical Reviews

Quantity Theory of Money

This theoretical exposition was first made known by Irving Fisher (1911). As the theory demonstrates, the major factor that determines changes in the overall level of prices is the amount of money in circulation at any one time. The argument here is that, in a long-run equilibrium economy, dynamics in money supply, also changes the price level, but this is not always the case in a disequilibrium economy. This is the case even if it is not necessarily the case in equilibrium. In his argument, Diamond (2003) asserts that goods and services price is the primary factor that determines economic aggregates, making money irrelevant. Through their combined efforts, economists i.e. Adam Smith, David Richardo, Jean Baptist Say, and Piguu, likewise others who shared similar beliefs, led to the formation of the classical school of thought. During that period of time, monetary policy was seen to be an inefficient method of fighting depressions. Additionally, the concept of a market that self-regulated and produced results that were socially acceptable was abandoned. If the amount of money doubles, the value of money will decrease by half, and the price level will also double if the liquidity supply is not channeled into the economy via productive activities. This has the potential to have a substantial impact on the economy. The equation of exchange, often known as Fisher's theory, may be expressed in the following way:

$$MV = PT \quad (2.1)$$

Where: M represents actual money supplied; V represents circulating money velocity in transactions; P represents average level of prices, T represents real volume of transactions in the market for a period of time.

Equation 2.2 asserts that the product of the money supply (M) and its velocity (V) is equivalent to the product of the average price level (P) and the total number of transactions (T). This connection relates transactional money demand (PT) to supplied amount of money (MV).

Better clarified, it is often preferable to replace T with Q, representing the "quantity of goods involved." This refinement leads to the Fisherian equation being expressed as:

$$MV = PQ \quad (2.2)$$

Fisher also asserted that the average turnover rate of money or money velocity (V) is determined by the prevailing average price (P) multiplied by transactions volume (T), as a ratio of total stock of money (M). stated as $PT/M = V$. Noting that, T and V remain constant, if money injection doubles, price level will also be doubled. Since the factors that may alter the money's velocity take time to materialize, we shall assume a constant velocity for the time being. The payment frequency, population density (weekly or monthly), credit accessibility, distance to merchants, and so on are all instances of such features. As a result, the link between money supply and price level is clear and proportionate. The idea, as stated by Ajudua et al. (2015), rests on the premise that money is neutral.

Keynesian Fiscal Theory of Output and Income

John Maynard Keynes (1883–1946) popularized the theory of income and output as it relates to fiscal policy. As attested by this school of thought, the only way for the government to alleviate long-term economic downturns and unemployment is to change tax policies and increase spending to boost production, growth, and employment. Additionally, he brought up the fact that the economy's unemployment problem—defined as production falling short of the full employment level—requires the implementation of a suitable fiscal policy solution. Government spending cuts, tax increases, or a mix of the two might constitute this policy style. The governments of many nations recognize fiscal policy as a set of tools for efficient administration of taxation and other forms of public funding. Modifications to taxes and adjustments to government spending make up the policy. To put it simply, spending is the engine that drives production, which in turn produces money and jobs, as attested by Keynesian theory. In congruent with this point of view, the manufacturing and delivery of goods and services are driven by aggregate demand, which may also be referred to as total spending. Companies will reduce output if consumer spending falls, whether due to gloomy expectations for the future or a preference to put more money away in the present (Nyong, 2001). Therefore, production drops as a consequence of reduced expenditure. Many other macroeconomic fundamentals inevitably fall as a result of this. As attested by the hypothesis, the multiplier directly affects revenue as a function of changes in government spending. Consequently, aggregate demand comprises government spending. Government tax increases, whether in the form of higher rates or a larger lump amount, dampen economic activity. Since taxation withdraws funds from an income stream and spending injects them, a higher tax rate has the reverse effect of reducing economic activity, in contrast to higher government expenditure, which boosts economic activity (Nyong, 2001). Thus, it is clear that changes in government spending, which constitute fiscal policy, stimulate the economy and lead to growth on all fronts.

Neoclassical Synthesis Paradigm

The neoclassical synthesis, often called the neoclassical-Keynesian synthesis, is a school of thought in economics that sought to unite neoclassical theory with John Maynard Keynes's macroeconomic theories (Mankiw, 2006). In an effort to bridge the two schools of thought's apparent gaps and develop a more all-encompassing theory of macroeconomics, this synthesis arose in the middle of the twentieth century. Notable post-war economists and leaders of the mainstream of macroeconomic theory, comprising Hicks (1937), Modigliani (1944), and Samuelson (1948), developed it. Paul Samuelson popularized the term "neoclassical syntheses" in his influential work "Economics." He proposed a new general theory of economics as the basis for the synthesis, with the goal of bringing together the best parts of earlier studies in a harmonious whole. As attested by this theory, all economists should agree that monetary and fiscal policies can help stabilize economies.

Owing to the foregoing, it seems that monetary and fiscal policy measures are the main instruments for applying neoclassical synthesis throughout the current era of macroeconomic policy. It contends that control of the money supply or fiscal policy, which involves changes in government spending and taxes, may affect price stability and other important economic factors. So, as attested by Kenton (2023), the economic production, employment, and commodity prices may all be affected by the interaction coordination of the two policy instruments.

Related Empirical Reviews

In the preceding few years, numerous empirical studies have investigated the correlation between economic policies and the overall level of prices, disclosing a diverse array of conclusions and methodologies. From 1990 to 2022, Nwikina, Akidi, and Abdullahi (2024) investigated how commodity price in Nigeria is impacted by

selected monetary policy variables. This year, they discovered that the RIR had a slight but positive impact on commodity prices, both in the long and short term, using the ARDL analysis method. The BMG was negative, the rate of Treasury bills was negative but substantial in the short term, and the official exchange rate was positive but insignificant in the long-term and short-term effects on commodity prices. The cash reserve ratio was positive in terms of long-term effects. Using his calculations, Gökhan (2023) ascertained the impact of fluctuations in supply of broad money (M2) and the US dollar and the Turkish lira exchange rate (EXR) on the pricing of agricultural commodities. The vector error correction model (VECM) estimates the orientations and magnitudes of the linkages among the variables, which are consistent with the short-term causal link between agricultural price (AP) and M2. However, the reverse is not correct. Compared to M2, EXR has far-reaching long-term repercussions. Previous research has demonstrated that exchange rate and M2 had substantial long-run influence on agricultural prices. This study's results are consistent with this. Ahmed and Ibitoye (2016) employed OLS regression analysis to investigate how Nigeria's monetary policy exerted on price stability, utilizing data collected for 1970 to 2014, with Consumer Price Index (CPI) as its dependent variable. The research demonstrated that the money supply and exchange rate had a temporary and enduring impact on price stability.

In his 2023 appraisal, Olukemi appraised the effectiveness of Nigeria's Open Market Operations in controlling inflation from 1985 to 2020. The results demonstrated that the consumer price index (CPI) had a favorable association with open market activities and a beneficial influence on the inflation rate in Nigeria, but the effect was not statistically substantial. The investigation employed data sourced from the statistics bulletin of the CBN employing OLS regression techniques. employing the ARDL data analysis approach and a data-rich framework that covered 1986–2020, researchers Onehi, Patrick and Terungwa (2022) and Haruna, et al. (2022) discovered that RIR substantially affected price stability adversely, whereas EXR, M2, and MPR had no influence. In their ARDL study covering the years 1985–2019, Eggon and Ajidani (2021) appraised the interplay between the rates of inflation, monetary policy, and the Nigerian currency. Researchers found that the BMG affected inflation positively, but the MPR and exchange rate had the opposite impact. In exploring how monetary policy implicated on price stability in Nigeria, for the period 2006 to 2018 (Torutein, et al., 2021). Regression and linear correlation findings show that the following rates had the highest output sequence: interest, currency, inflation, and MPR. This establishes a close connection between price control and Nigeria's monetary control policy. To examine the impact of monetary policy on non-oil output in Nigeria, (Akidi, Agiobenebo & Ohale, 2018) employed secondary data spanning 1980–2016 and the error correction model. Findings were in line with theory and demonstrated that, throughout the sample period, monetary policy actions had the anticipated impact on non-oil output.

To examine the effect of fiscal policy aggregates on price stability in Nigeria, Ene and Kasim (2021) employed the ARDL Model and the Error Correction Model (ECM) employing annual data from 2000 to 2019. Neither the immediate nor the distant results indicated any change to government expenditure or the deficit. On the other side, taxation substantially and favorably affects price stability. Otto and Ukpere (2015) appraised fiscal policy and inflation. Government expenditure substantially affected price rises, in congruent with the study that employed OLS regression analysis. In 2018, the researchers (Akidi, Agiobenebo, and Ohale) appraised fiscal policy's affected non-oil output in Nigeria. Through the use of a regression analysis that incorporates independent variables i.e., government capital investment, government recurrent expenditure, corporate income tax revenue, foreign borrowing, and domestic borrowing, we examine non-oil output from 1980 to 2016. The employed error correction approach proved that fiscal policy substantially affected non-oil output over the studied period. Foreign and domestic borrowings were the only outliers; they had a substantial inverse impact.

Ekong and Effiong (2020) appraised the effectiveness of fiscal and monetary policy cooperation in controlling inflation in Nigeria employing data spanning 1985 to 2019. In their search for evidence of cointegration, the study team employed the Error Correction Mechanism (ECM) in conjunction with the ARDL bounds test. The Error Correction Mechanism verifies that 55.4% of the short-run imbalance is corrected annually. Additionally, the study demonstrated that both the fiscal policy and monetary policy channels substantially impacted inflation, both immediately and over the long run. Gbadebo et al. (2018) appraised how monetary and fiscal policies affected price stability in Nigeria. The authors found that monetary and fiscal policy had an interaction effect on the CPI employing the OLS approach. The researchers found that government policies had a substantial influence on price controls overall, even if the effects of the individual factors were varied. Yakubu, et al., (2013)

conducted empirical research evaluating the interactive influence of fiscal and monetary policies in Nigeria on prices and outputs increase. Market forces continue to dominate economic activity over the majority of time periods, notwithstanding the substantial impact of monetary and fiscal policy factors. In congruent with recent studies, government spending and the money supply really boosted GDP and prices over the long term. In congruent with the estimates, monetary and fiscal policies impact inflation and real GDP in Nigeria more than any other factor.

Empirical Gap

Upon exploring the empirical contributions of other researchers, it was discovered that the majority of prior studies focused on monetary policy as the primary influencer of price stability. Only a small number of authors, comprising Otto and Ukpere (2015) and Ene and Kasim (2021), empirically explored how fiscal policy exerted on Nigeria’s price stability. Regrettably, not a single study, with the exception of Gbadebo, et al., (2018) and Yakubu, et al., (2013), appraised the impact of the interplay between monetary and fiscal policy on commodity prices in Nigeria. Consequently, this examination empirically appraised the relative effects of monetary and fiscal policies, comprising the growth of the BMG, the RIR, the growth of federal government revenue, and the growth of federal government expenditure, on commodity prices in Nigeria. This investigation also distinguished itself from prior investigations by assessing the influence of government expenditure growth synthesis and BMG on commodity prices in Nigeria.

METHODOLOGY

Research Design

The ex-post facto research design was adopted in this study, which was founded on extant annual time series data. These data were compiled from the National Bureau of Statistics and the CBN statistical bulletin. From 1990 to 2022, the data comprised thirty-three (33) years of sample observations.

Model Specification and Expectations

This research on how ‘monetary and fiscal policies’ measures impact on commodity price is particularly rooted in the monetarist and Keynesian theories. While proponents of monetary policy argue that adjustments to the money supply and interest rates are more effective at positively impacting economic aggregates, Keynesians argue that government spending and taxation are the primary tools for fiscal policymakers to influence essential economic variables like employment, price levels, and output. Later adherents, building on the strong arguments of both propositions, proposed the monetary-fiscal synthesis, which states that the CPI and economic stability are both greatly affected by the measures of well-coordinated monetary and fiscal policies. Modifications made to the research by Gökhan (2023) provide the empirical basis of this study's model. Thus, the researcher adjusted the model to comprise additional policy variables so as to achieve the objective of this study. Here is the functional expression of the current extended model:

$$CPI = f (BMG, RIR, GRG, GXG, BMG*GXG) \tag{3.1}$$

Specification (3.1) above is transformed into an econometric model with introduction of the error term as follows:

$$CPI_t = \beta_0 + \beta_1 BMG_t + \beta_2 RIR_t + \beta_3 GRG_t + \beta_4 GXG_t + \beta_5 BMG*GXG_t + \mu_t \tag{3.2}$$

Where: CPI = Commodity Price Index, BMG = Broad Money Supply Growth, RIR = Real Interest, GRG = Federal Government Revenue Growth, GXG = Federal Government Expenditure Growth, BMG*GXG = Broad Money Supply Growth and Government Expenditure Growth Interaction, generated by multiplication of both, μ = Error term, β_0 = Constant, $\beta_1 - \beta_5$ = Estimated Parameters

Apriori Expectation: $\beta_1, \beta_3, \beta_4$ and $\beta_5 < 0, \beta_2 > 0$

The signs $\beta_1, \beta_3, \beta_4$ and β_5 are in theory probable to have a negative link with CPI while β_2 is expected to have

positive link with the regressand.

Data Analysis Techniques

To ascertain the relative impact of fiscal and monetary policies on commodity prices in Nigeria, this investigation implements the ARDL methodology. Its purpose is to ascertain the dynamic links between the dependent and independent variables in the long and short term. The primary justifications for employing this method are its applicability in small data sets, its simplicity in application through the use of OLS, the absence of an endogeneity issue, the ability to estimate both long-run and short-run co-efficient simultaneously, and the potential to combine both I (1) and I(0) stationary variables in the estimation process (Pesaran, Shin & Smith, 2001; Sulaiman & Mohammad, 2010). Consequently, the long-run ARDL model and the short-run dynamic mode as specified in this study are as follows.

The specified ARDL’s long-run model is presented in Equation 3.3:

$$\begin{aligned} \Delta \ln(CPI_t) = & \delta_0 + \delta_{1i}\Delta(CPI_{t-1}) + \delta_{2i}\Delta(BMG_{t-1}) + \delta_{3i}\Delta(RIR_{t-1}) + \delta_{4i}\Delta(GRG_{t-1}) + \delta_{5i}\Delta(GXG_{t-1}) \\ & + \delta_{6i}\Delta(BMG * GXG_{t-1}) + \sum_{t=1}^p \alpha_{1i}\Delta(CPI_{t-1}) + \sum_{t=1}^q \alpha_{2i}\Delta(BMG_{t-1}) + \sum_{t=1}^q \alpha_{3i}\Delta(RIR_{t-1}) \\ & + \sum_{t=1}^p \alpha_{4i}\Delta(GRG_{t-1}) + \sum_{t=1}^p \alpha_{5i}\Delta(GXG_{t-1}) + \sum_{t=1}^p \alpha_{6i}\Delta(BMG * GXG_{t-1}) + \varepsilon_{1i} \end{aligned} \quad (3.3)$$

The short-run ARDL dynamic model is presented form:

$$\begin{aligned} \Delta \ln(CPI_t) = & \alpha_0 + \sum_{t=1}^p \alpha_{1i}\Delta(CPI_{t-1}) + \sum_{t=1}^q \alpha_{2i}\Delta(BMG_{t-1}) + \sum_{t=1}^q \alpha_{3i}\Delta(RIR_{t-1}) + \sum_{t=1}^p \alpha_{4i}\Delta \ln(GRG_{t-1}) \\ & + \sum_{t=1}^p \alpha_{5i}\Delta(GXG_{t-1}) + \sum_{t=1}^p \alpha_{6i}\Delta(BMG * GXG_{t-1}) + \delta ECM_{t-1} + \varepsilon_{1i} \end{aligned} \quad (3.4)$$

Δ represents the difference operator, indicating the optimum lag. δ_1 to δ_6 are the long-run dynamic co-efficient, while α_1 to α_6 denote the short-run dynamic co-efficient. ε_{1t} is a serially uncorrelated stochastic term with zero mean and constant variance. The error correction model (ECM_{t-1}) captures the error correction term derived from short-run analysis, where δ measures the error co-efficient. This co-efficient reflects the speed at which the co-integration model corrects disequilibrium from the previous period, restoring long-run equilibrium. The ECM term's co-efficient is expected to be negative and statistically substantial to confirm the model's validity. A negative and substantial ECM_{t-1} indicates that short-run deviations between the dependent and explanatory variables will converge toward long-run equilibrium. However, this approach has limitations if all variables are first-difference stationary in unit root tests.

ANALYSIS RESULTS AND DISCUSSIONS

Descriptive Analysis

The descriptive statistics for the variables are summarized in Table 4.1 below. The schedule presents the data characteristics results of CPI, BMG, RIR, federal government revenue growth, federal government expenditure growth and the interaction variable of BMG and government expenditure growth over a period 1990 to 2022. As shown, CPI recorded a mean value of 105.01% with a maximum of 421.1% and minimum of 2.4% per annum. The standard deviation of commodity price index (CPI) is 109.02%, indicating that commodity price index (CPI) has low deviation from the mean over the sampled period. Similarly, broad money supply growth (BMG)

recorded over the period a mean value of 24.48% with a maximum of 68.57% and minimum of 2.3% per annum. The standard deviation of BMG is 16.51%, suggesting that BMG has low

Table 4.1: Descriptive Statistics

	CPI	BMG	RIR	GRG	GXG	BMG*GXG
Mean	105.0061	24.48892	-0.700683	24.05920	24.60442	23.33298
Median	66.40000	19.63402	-2.205154	13.82609	17.43270	14.69709
Maximum	421.1000	68.57335	48.92554	127.8356	113.5286	135.0778
Minimum	2.400000	2.301719	-38.52349	-38.41558	-26.02089	-37.61049
Std. Dev.	109.0261	16.51551	18.50131	41.05702	30.99521	38.13548
Skewness	1.328264	0.877435	0.645017	0.816748	1.415589	1.517411
Kurtosis	3.976648	3.118011	3.758448	3.015722	5.030728	5.260513
Jarque-Bera	11.01511	4.253554	3.079217	3.669267	16.69171	19.69009
Probability	0.004056	0.119221	0.214465	0.159672	0.000237	0.000053
Sum	3465.200	808.1344	-23.12254	793.9536	811.9458	769.9882
Sum Sq. Dev.	380374.0	8728.390	10953.55	53941.71	30742.49	46538.07
Observations	33	33	33	33	33	33

Source: Author’s Computation, 2024 (EViews 12.0).

dispersion from the mean from 1990 to 2022. Furthermore, real interest rate (RIR) recorded over the period a mean value of -0.70% with a maximum of 48.93% and minimum of -38.52% per annum. The standard deviation of RIR is 18.5% and this indicates that RIR had high dispersion from the mean over the period. Also, federal government revenue growth (GRG) recorded a mean value of 24.06% with a maximum of 127.84% and minimum of -38.42% per annum over the period. The standard deviation of federal government revenue growth is 41.06%, showing that federal government revenue growth had high deviation from the mean. In addition, federal government expenditure growth (GXG) recorded an average value of 24.6% with a maximum of 113.53% and minimum of -26.02% per annum. The standard deviation of federal government expenditure growth is 30.99%. This indicates that federal government expenditure growth has low deviation from the mean over the study period. Lastly, BMG interaction with government expenditure growth (BMG*GXG) recorded a mean value of 23.33% with a maximum of 135.08% and minimum of -37.61% per annum. Its standard deviation is 38.14%. This specifies that the interaction of BMG with government expenditure growth had low deviation from the mean over the 1990 to 2022 period.

Unit Root Test

The existence of a cointegration link is contingent upon the testing of the unit roots of a series. Subsequently, this investigation implemented the widely recognized Augmented Dickey-Fuller (ADF) unit root test to evaluate the stationarity conditions of each variable. The results presented in Table 4.2 below showed that only broad money supply growth (BMG) attained stability after first differencing. This explains that BMG is stationary at order one [i.e., I (1)]. On the other hand, commodity price index (CPI), real interest rate (RIR), federal government revenue growth (GRG), federal government expenditure growth (GXG) likewise broad money supply growth (BMG) and government expenditure growth interaction (BMG*GXG) attained stability at levels. This further indicates that commodity price index (CPI) real interest rate (RIR), federal government revenue growth (GRG), federal government expenditure growth (GXG) and policies interaction variable BMG*GXG are integrated at order zero [i.e., I (0)].

Table 4.2: Augmented Dickey-Fuller (ADF) Test Results

ADF						
Variables	Level	Critical Value @ 5%	1 st Difference	Critical Value @ 5%	I(d)	Stationary @
CPI	-3.122901**	-2.963972	-	-	I (0)	Level
BMG	-1.954099	-2.957110	-9.310477**	-2.960411	I (1)	1 st Difference
RIR	-6.356450**	-2.960411	-	-	I (0)	Level
GRG	-5.732816**	-2.957110	-	-	I (0)	Level
GXG	-7.603625**	-2.957110	-	-	I (0)	Level
BMG*GXG	-6.975087**	-2.957110	-	-	I (0)	Level

Note: *, **, and *** denote significance at 10%, 5% and 1%, respectively

Source: Author’s Computation, 2024 (EViews 12.0).

Conclusively, attainment of mixed stationarity from the unit roots tests necessitated use of the ARDL method in estimating the long run link among the variables and the error correction model.

ARDL Bound Cointegration Test

Considering that the F-statistics value of 6.327506 is greater than the 5% upper bound critical value of 3.38, the results of the ARDL bounds cointegration test in Table 4.3 below show that there is a long-run link or cointegration among the following variables: commodity price index (CPI), broad money supply growth (BMG), real interest rate (RIR), federal government revenue growth (GRG), federal government expenditure growth (GXG), and the interaction between BMG and government expenditure growth (BMG*GXG). Applying the ARDL long run and short run dynamic analyses was necessary for confirming long run dynamics among the variables and for estimating the nature of the theoretical and substantial links between the dependent and independent variables.

Table 4.3: ARDL Bounds Cointegration Test

	Critical Value Bound		F-Statistics
F _{CPI} (BMG, RIR, GRG, GXG, BMG*GXG)			6.327506**
K = 5			
Significance	I (0) Bound	I (1) Bound	
10%	2.08	3	
5%	2.39	3.38	
2.5%	2.7	3.73	
1%	3.06	4.15	

Note: Null hypothesis: No level link; K = number of regressors; *, ** and *** denote significance at 10%, 5% and 1% level, respectively.

Source: Author’s Computation, 2024 (EViews 12.0).

Lag Selection Criteria

The lag selection criteria result as presented in Table 4.4 below indicates that the appropriate optimal lag length that will leads to a reliable cointegration result as attested by Akaike Information

Table 4.4: Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-815.0967	NA	2.39e+16	54.73978	55.02002	54.82943
1	-689.4853	192.6042*	6.41e+13	48.76569	50.72736*	49.39324
2	-648.9770	45.90944	6.50e+13	48.46513	52.10825	49.63060
3	-590.0915	43.18268	3.83e+13*	46.93943*	52.26398	48.64280*

Source: Author’s Computation, 2024 (EViews 12.0).

Criterion (AIC) is lag three and as a result, other subsequent analyses were conducted employing the optimal lag length of three.

Discussion of Autoregressive Distributive Lag (ARDL) Analysis Results

So as to determine the influence that monetary and fiscal policies had on commodity prices in Nigeria from 1990 to 2022, this research conducted an empirical analysis of the time series data employing the ARDL estimate approach. The proxies of monetary and fiscal policies are shown to have both short-term and long-term effects on the CPI, as shown in Table 4.5.

Broad Money Supply Growth (BMG) and Commodity Price Index (CPI)

We show the short-run estimates of the ARDL model in Table 4.5. The results demonstrated that the growth of the BMG had a considerable and unequivocally negative influence on the CPI in Nigeria (-0.001588). An increase of 2% in the BMG is responsible for the 0.02% decrease in the CPI that occurred in the short term. Furthermore, the long-term estimates of the ARDL model demonstrated that the wide money supply growth has a negative influence on the CPI in Nigeria, with a negative value of -0.737985. This impact is statistically substantial, with a value of 0.0004 being less than the threshold of 0.05. Consequently, this indicates that the index of commodity prices will decrease by 73.8% over the course of the long run for each percentage increase in the growth of the BMG. The results of Onehi, Patrick, and Terungwa (2022) provide support for this conclusion. These researchers found that the BMG had a negative impact on the stability of prices in Nigeria.

Real Interest Rate (RIR) and Commodity Price Index (CPI)

Furthermore, the short-run estimates, which are shown in Table 4.5, have revealed that the RIR in Nigeria had a substantial influence ($0.0000 < 0.05$) and a positive impact (0.015891) on the CPI across the country. As a consequence of this, it seems that a percentage rise in the RIR in the near run was the cause of a substantial increase in the CPI of 1.6%. At the same time, the long-term estimations of the ARDL model findings demonstrated that the RIR has a positive influence (0.0158912) and a substantial influence ($0.0006 < 0.05$) on the CPI in Nigeria. Owing to this information, it seems that a percentage rise in the RIR over the long term was the cause of a considerable increase of 1.6% in the CPI. Moreover, Eggon and Ajidani (2021) found that the RIR, which is a measure of monetary policy, had a negative impact on inflation. This finding provided further evidence that this conclusion is correct.

Table 4.5: Estimated Long-Run and Short-Run Co-efficient of ARDL

Dependent Variable = CPI				
Short-Run Results				
Variable	Co-efficient	Std. Error	t-Statistic	Prob.*
DLOG(CPI (-1))	0.737985	0.077090	9.572970	0.0000
D(BMG)	-0.001588	0.000232	-6.856567	0.0000
D(RIR)	0.015891	0.002324	6.836919	0.0000
D(GRG)	-0.068011	0.036951	-1.840570	0.0822
D(GXG)	-0.011378	0.001648	-6.902172	0.0000
D(BMG*GXG)	-0.195262	0.091252	-2.139813	0.0432
D(BMG*GXG(-1))	0.062365	0.034940	1.784927	0.0911
CointEq (-1) *	-0.015761	0.004415	-3.570111	0.0022
R ² = 0.869443				
Adjusted R ² = 0.836804				
Durbin-Watson stat = 1.934079				
Long-Run Results				
BMG	-0.737985	0.172359	-4.281663	0.0004
RIR	0.015892	0.003796	4.186447	0.0006
GRG	-0.089859	0.107803	-0.833543	0.4155
GXG	-0.011061	0.002701	-4.094881	0.0007
BMG*GXG	-0.978672	0.015467	-63.27585	0.0000
C	40.04896	19.95314	2.007151	0.0600
EC = CPI - (-0.7380*BMG + 0.0159*RIR - 0.0899*GRG - 0.0111*GXG - 0.9787*BMG*GXG + 40.0490)				

Source: Author’s Computation, 2024 (EViews 12.0).

Federal Government Revenue Growth (GRG) and Commodity Price Index (CPI)

In addition, the CPI in Nigeria was negatively affected by federal government income increase (-0.068011), but this impact was not statistically substantial (0.0822 > 0.05), as attested by the short-run data. This means that in the near term, the CPI fell by an inconsequential 8.2% due to a rise in federal government income growth. In addition, the long-term estimates showed that the increase in federal government income had a negative impact on the CPI in Nigeria, with a p-value of -0.089859. This impact was not statistically substantial, however, at 0.4155 > 0.05. In other words, the long-term effect of a percentage rise in federal government income growth on the CPI was a negligible 9.0% drop. Consistent with previous research, this result confirms that federal government income has a negative correlation with price stability in Nigeria (Ene and Kasim, 2021).

Federal Government Expenditure Growth (GXG) and Commodity Price Index (CPI)

There was a negative (-0.011378) and statistically substantial (0.0000 < 0.05) impact of federal government spending increase on the CPI in Nigeria, as attested by the short-run findings of this regressor. In the near term, this means that the CPI fell by 1.1% due to a rise in government spending. Over the long term, the ARDL model

found that the increase in federal government spending had a negative impact on the CPI in Nigeria, with a value of -0.011061 and a substantial value of $0.0007 < 0.05$. That means that in the long term, the CPI fell by 1.1% for every percentage point rise in government spending. This agrees with the findings of Gbadebo et al. (2018), who confirmed that spending by the federal government substantially affects the consumer price index (CPI), a measure of price stability in Nigeria.

Broad Money Supply Growth and Government Expenditure Growth (BMG*GXG) Interaction and Commodity price index (CPI)

The coordination between the BMG and government spending growth had a negative (-0.195262) and substantial ($0.0432 < 0.05$) impact on the CPI in Nigeria, as attested by the short-run study of policy interaction. In the near term, this means that the CPI fell by 19.5% due to a rise in the injection components of policy coordination. In addition, the long-term estimations showed that the CPI in Nigeria was adversely (-0.9787) and substantially ($0.0000 < 0.05$) affected by the synthesis of BMG and government spending increase. This means that the long-term impact of the link between the expansion of the money supply and the expansion of government spending was to reduce commodity prices by 97.9 percent. Ekong and Effiong (2020) came to a similar conclusion, stating that monetary-fiscal coordination factors i.e., the expansion of the money supply and government spending are crucial to the success of inflation targeting in Nigeria.

The short-term results showed that RIR and money supply growth, two indicators of monetary policy, substantially impacted CPI, whereas growth in federal government expenditure was the only indicator of fiscal policy to show any substantial impact. As a result, in the near term, commodity prices in Nigeria may be better targeted by monetary policy tools. Additionally, when considering the long-term significance level, the two fiscal policy measures had less of an impact on the CPI than the expansion of the money supply and the RIR. Therefore, it follows that monetary policy works better in the long term to manage commodity prices in Nigeria. As attested by the researcher's findings, monetary policy, especially when it comes to commodity prices in Nigeria, is much more successful than fiscal policy in managing inflation, both in the short and long term.

Table 4.5 further displays the outcomes of the short run dynamic co-efficient linked to the long run links as derived from the error correction model. There is congruence between the indications of the long-term connection and those of the short-term dynamic exchanges. With a p-value of 0.0022 and an estimated error correction co-efficient of -0.015761 , we may conclude that the system recovers from shocks rather quickly, and its sign is accurate. So, around 1.6% of the disequilibria caused by the shock last year converge to the long-term equilibrium this year. Owing to the short-run estimates of the ARDL model, the estimated model is well-fitting with an Adjusted R-squared value of 0.836804. This means that the model adequately describes the data, with the explanatory variables (RIR, BMG, federal government revenue growth, federal government expenditure growth, and the interaction between these two variables) explaining about 84% (R-squared) of the variation in the CPI, and other variables or factors outside the model explaining the remaining 16%. Finally, there is no serial autocorrelation if the Durbin-Watson statistic is 1.934079, which is closer to 2.

Post-Estimation Tests

Table 4.6 presents the results of the post-estimating tests that were carried out after the estimation process. The result of the Jarque Bera (Normality) test reveals that the probability value (0.866915) is higher than the 0.05 threshold of significance, which means that the failure to reject the null hypothesis of the Normal distribution is not possible. As a result, this is a necessary condition for the acceptance of the null hypothesis, which ultimately results in the conclusion that the model follows a normal distribution. Furthermore, the result of the Breusch-Godfrey Serial Correlation LM test demonstrates that the probability value (0.8335) is higher than the 0.05 threshold of significance, which suggests that the null hypothesis is not true.

Table 4.6: Post-Estimation Test Results

Test	Null Hypothesis	X ² Value	X ² Prob	Remark
Jarque-Bera	Normal distribution exists	0.285628	0.866915	Normal residuals

Breusch-Godfrey LM	Serial correlation does not exist	0.184242	0.8335	Serial independence
Breusch-Pagan-Godfrey	Homoscedasticity exists	0.848315	0.5997	Constant Variance
Ramsey RESET	Model is stable	4.171772	0.0808	correctly specified model

Source: Author’s Computation, 2024 (EViews 12.0).

It is impossible to refute the hypothesis that there is no serial correlation. As a result, the null hypothesis's confirmation suggests that the model does not have a serial correlation issue. Also, the Breusch-Pagan-Godfrey heteroskedasticity test results suggest that the probability values (0.5997) surpass the 0.05 level of significance, which undermines the null hypothesis of homoscedasticity. This leads to the adoption of the null hypothesis, which indicates that the model is homoscedastic. This implies that the presence of relevant variables was not absent. Lastly, the Ramsey RESET test result suggests that the probability values (0.0808) exceed the 0.05 level of significance, which is in direct opposition to the null hypothesis of the accurate model specification. This leads to the acceptance of the null hypothesis and the precise specification of the model. This implies that the functional form of the model is quite precise.

The cumulative sum (CUSUM) graph below shows that the CUSUM line remained within the 5 percent critical bound, and neither of the CUSUM plots crossed the 5 percent critical lines. The implication is that the long-run co-efficient of the study variables are stable.

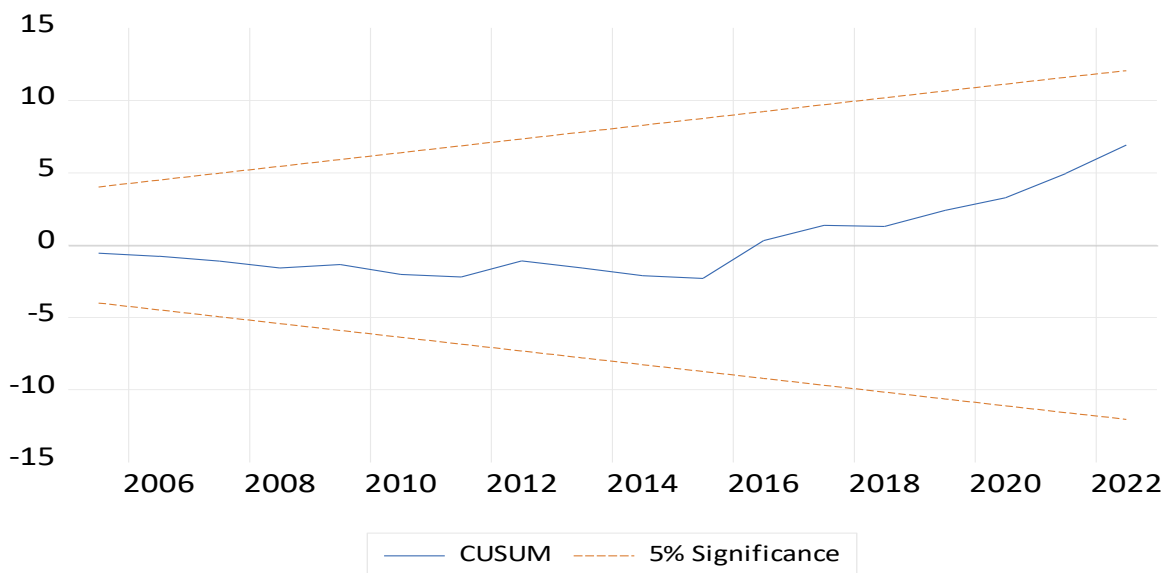


Figure 4.1: Stability CUSUM’s Test Graph

CONCLUSION AND RECOMMENDATIONS

Conclusion

In Nigeria, the management of commodity prices is a critical challenge that is bound up with economic stability and growth. In the shaping of these outcomes, the effectiveness of policy interventions, particularly monetary and fiscal measures, is of paramount importance. This study empirically investigated the relative impacts of monetary and fiscal policies on commodity prices in Nigeria, owing to the aforementioned. The empirical analysis demonstrated that monetary policy fundamentals are relatively more effective for managing commodity price movements than fiscal policy measures considering the short-term and long-term period. The study also indicated that the coordinated interactive variable, applied as the product of BMG and government expenditure growth (BMG*GXG) had substantial moderating impact on commodity price behaviour. Predicated on these key findings, the study concluded that in the covered data period, monetary policy is relatively more effective

for inflation targeting, particularly commodity price in Nigeria than fiscal policy actions. However, the researchers also concluded that proper synthesis of the injection components of monetary and fiscal policies is imperative for substantially curbing commodity price level in Nigeria

Recommendations

The following recommendations are proffered owing to the findings of this study:

1. Central Bank of Nigeria should implement production stimulation targeted monetary policy that carefully manages BMG to dampen commodity price inflation pressure. The CBN can use monetary policy tools i.e., adjusting the cash reserve ratio for banks, implementing open market operations, and managing interest rates to keep BMG within optimal levels that support economic activity without stoking price level.
2. Government should ensure RIRs (real interest rates) remain aligned with inflationary trends to influence borrowing, spending, and saving behaviours, thereby stabilizing commodity prices. By maintaining RIRs that reflect inflation trends, the CBN can moderate excessive borrowing or saving behaviours. Low RIR would stimulate productive economic activities without excessive upward pressure on prices.
3. Nigerian government should ensure market friendly growth in revenue mobilization to prevent excessive fiscal deficits that can fuel inflation and engender unhealthy commodity prices, and more of her expenditures should be deliberately channeled to spur real economic activities for propping up supply side so as to reduce commodity price hike.
4. Having also found that monetary-fiscal policies synthesis as product of their injection instruments substantially contributed to moderating commodity price level, it is suggestively important for the apex monetary and fiscal authorities to consciously coordinate their injection tools to stimulate real economic activities for healthy market price outcomes.

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