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ASYMMETRIC EFFECTS OF FISCAL POLICY ON ECONOMIC DEVELOPMENT IN NIGERIA

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Abstract

The feasibility of fiscal policy in achieving economic stabilization is really a contending issue. The debate on the most suitable fiscal instrument for controlling the economy in the face of globalization has been dominated by various schools of thought. The paper investigates the asymmetric effects of fiscal policy instruments on economic development in Nigeria between 1981 and 2022. Annual secondary data on poverty rate, unemployment rate, real interest rate, human development index (HDI), debt-to- GDP ratio, revenue as a percentage of GDP, expenditure as a percentage of GDP, inflation rate and population rate of Nigeria were used. Data sourced from the World Development Indicators (WDI, 2023); International Monetary Fund (IMF, 2023), United Nations Development Programme (UNDP, 2023) and World Bank Group, (2023) were analysed using a Non-linear ARDL (NARDL) technique. The findings of the study reveal that shocks to government expenditure, revenue and debt have significant non-linear impacts on unemployment rate, poverty rate and HDI in Nigeria. It is therefore concluded that fiscal policy instruments confer significant asymmetric effects on economic development in Nigeria. Also, it is recommended that policymakers should adopt expansionary fiscal policy during economic downturns to sustain low unemployment and poverty rates as well as low HDI.

Keywords: Asymmetric Fiscal Policy, Government revenue, Government spending, Nonlinear Effects and Nigeria.

JEL codes: E61, 011, C22, H30, 055

INTRODUCTION

Fiscal policy in Nigeria began under British colonial rule in the early 20th century and relied greatly on customs duties, indirect taxes as well as grants to finance administrative and military outlays. As an independent nation, Nigeria inherited these tax structures and at start ran modest surpluses throughout the 1960s. Thus, Fluctuating global oil price in the 1970s led to boom-bust Fiscal swings and suboptimal growth performance. To address Ffscal instability, Nigeria adopted the Structural Adjustment Program (SAP) in 1986, which included devaluation of the naira, subsidy removal, trade liberalization and privatization, however, these measures prompted

widespread social unrest and led to the introduction of Value Added Tax (VAT) in 1993 (Adeosun, Ayodele & Jongbo, 2021). The democratic era and institutional reForms in the

2000s improved Fiscal discipline and transparency, but expenditure patterns remained highly unstable (Aigheyisi & Edore, 2019). Since the 2010s, Nigeria has experienced rising public debt due to renewed oil volatility, infrastructure deficit and rising recurrent expenditure obligations (Olaniyi, 2020 & Ahmadu, 2021).

The debate on the most suitable fiscal policy instrument for controlling the economy in the face of globalization has been dominated by various schools of thought, with fiscal policy showing little short-term stabilization role (Obademi, 2018). This is not unconnected with the evidence that it gives priority to maintaining price stability over time. Fiscal policy is fundamental in driving economic development in Nigeria because it has been argued in literature that it can influence macroeconomic stability (batra & mahmood, 2018), infrastructure investment (Esfahani & Ramirez, 2023), human capital development (Psacharopoulos & Patrinos, 2018), poverty reduction (Banerjee, 2015) and inclusive growth (Aghion, 2019). Also, sound fiscal management, including prudent spending, revenue mobilization, and debt sustainability, stabilizes the economy and creates an investment-friendly environment towards achieving the desired level of economic development (Banerjee, 2015). A significant shift in government expenditure and taxation policy in developed countries led to a budget deficit and negatively impacts the balanced budget (Köktaş & Günel, 2022).

Though, Nigeria is the largest economy in Africa with a GDP of US$506.6 billion in the year 2023 but greater proportion of the population of this country still live below the poverty line (IMF, 2023). The government as well as non-governmental organisations in Nigeria has undertaken several initiatives to drastically lessen the rate of poverty in the country at large. It was found out by Ogwumike, (2021) that erstwhile poverty reduction measures put in place in Nigeria primarily focus primarily on growth, basic necessities and development strategies of rural areas. The growth approach in the first instance is assumed to lay emphasis on rapid economic development through proper policy management, while the basic necessities approach encompasses on fundamental requirements and needs for the poor.

The impact of fiscal policy on Nigeria's economic development is increasingly important due to the country's economic volatility, dependence on oil exports, and vulnerability to external shocks. Fiscal policy, including government spending and taxation decisions, is used to stimulate growth, reduce unemployment, and stabilize macroeconomic conditions. However, the effectiveness of fiscal policy in Nigeria exhibits asymmetric effects, meaning it does not produce the same outcomes depending on the economy's expansion or recession. This is due to structural vulnerabilities, inflationary pressures, and external dependencies while the effects of fiscal policies are especially sensitive to the economic environment, with external shocks and monetary dynamics playing a critical role (Adebiyi, 2020).

Empirical studies have shown that fiscal policy in Nigeria has a significant impact on economic development, particularly in relation to the country's oil dependency and socioeconomic challenges. In periods of economic contraction, such as the 2008 global financial crisis and the

2016 recession, Fiscal stimulus can boost aggregate demand and stimulate economic growth (Akinlo, 2017). Public expenditure, such as infrastructure investments and social transfers, helps cushion the negative effects of global oil price shocks and contributes to faster recovery (Folawewo & Olalekan, 2018). However, during economic booms, fiscal policy in Nigeria often produces more limited benefits and may contribute to economic overheating, inflation, and public debt accumulation. This is due to Nigeria's heavily reliant economy on oil exports,

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which can lead to excessive demand and inflation and fiscal policy during periods of strong growth can contribute to a crowding out effect, where government spending reduces private investment, failing to promote long-term growth (Folawewo & Olalekan, 2018).

As discussed earlier, Nigeria's fiscal policy is heavily influenced by its oil dependence, making it vulnerable to external shocks like Fluctuations in global oil prices (Köktaş & Günel, 2022). Oil price cycles shape the effectiveness of Fiscal policy, with declines leading to revenue shortfalls and high prices causing macroeconomic instability (Ogwumike, 2021). The country's heavy reliance on oil exports exacerbates the asymmetric effects of fiscal interventions while the effectiveness of fiscal policy is also influenced by the coordination between monetary and Fiscal policies ((Banerjee, 2015). Also, inflationary pressures can result from loose fiscal policies during economic expansion, while inadequate recovery can occur during recessions.

It is obvious that Nigeria's Fiscal history demonstrates asymmetric effects, with the impact of fiscal tools varying depending on regime, shock direction and macro context. Understanding these asymmetric effects is crucial due to oil-driven volatility, varied fiscal outcomes under different regimes, and evolving institutional contexts. Thus, the fiscal –economic development asymmetric relationship is yet unexplored, especially in Nigeria. As a result, the study investigates the asymmetric effects of fiscal policy on economic development in Nigeria. The remaining sections of this paper outline literature review in the section two, methodology is presented in the third section, the fourth section details the results and findings of the study while conclusion and recommendations are discussed in the fifth section.

LITERATURE REVIEW

Theoretical underpinning

The study is premised on Endogenous growth theory by Romer, (1986) which emerged as a critique of the traditional neoclassical growth models. The theory provides a strong theoretical foundation for understanding the asymmetric effects of fiscal policy, unlike neoclassical models which assume a country's long-run growth rate is determined by exogenous factors such as technological progress and population growth (Barro, 1990 & Rebelo, 1991). The theory posits that economic development is generated from within the economic system itself and can be influenced by government policies (Lucas, 1988).

Then, the "asymmetric" impact of fiscal policy instruments is rooted in this theory because the impact of a positive fiscal shock might not be equal and opposite to a negative shock. For instance, a spending increase on crucial infrastructure can bring about low rate of unemployment, poverty reduction and rising Human Development Index (HDI), while a spending cut may not have an equally strong negative effect if the private sector can pick up the slack. Equally, the way a

government finances its spending and the spending composition are key factors that the endogenous growth theory can help to explain.

Empirical Review

The two main instruments that the government uses to control an economy are monetary and fiscal policies. Musa, Asare, & Gulumbe, (2019) examined the effectiveness of monetary-fiscal policies in Nigeria's economy. They found that despite government revenue impacting growth, the unprecedented rise in general prices continues to eat deep into the economy. It is evidently clear from the result that the impact fiscal policy can confer on the economy rests on entirely

on the dominating monetary policy instrument at the moment. Similarly, there is no doubt that every expenditure decision of government is considerably premised on the available revenue – which is subject to the role of certain monetary policy instrument(s) in the economy. The study suggests a coordinated approach between fiscal and monetary policies for Nigeria's economic development, recognizing the dominant influence of these policies on economic activity dynamics. Also, Adebayo & Taiwo, (2025) employ an OLS regression data from 1986 - 2023 to show that a 1% increase in government expenditure leads to an 8.62% increase in GDP, while tax revenue and public debt effects are insignificant.

Fiscal policies have gained attention for regulating economies, but divergent views exist on which approach is better for smooth economic operation, as they impact employment and price stability in some countries amidst globalization. The feasibility of fiscal policy in achieving economic stabilization is really a contending issue. The debate on the most suitable fiscal policy instrument For controlling the economy in the face of globalization has been dominated by various schools of thought, with tax policy showing little short-term stabilization role (Obademi, 2018). This is not unconnected with the evidence that it gives priority to maintaining other fiscal variables over time. As a result, the study by Ijirshar, Akaakohol & Akaakohol (2021) uses the Nonlinear Autoregressive Distributed Lag (NARDL) model to examine the effects of government spending on economic growth in Nigeria and the Findings show that positive government spending positively impacts long-term economic growth, while negative cuts negatively impact it.

Fiscal policy is a financial tool employed to correct series of economic disturbances and restore the economy to its steady state. Sequel to the above, Ehinmilorin, Bamidele-Sadiq, Udonwa & Ekpeno, (2021) investigate the impact of fiscal policy on the rate of poverty in Nigeria. The results show that both tax and non-tax revenue of government are found to have impacted significantly the level of poverty on one side. Similarly, the balloons in oil revenue have attracted rising recurrent spending and led to expanded public structures vulnerable to corruption and leakage which reduce the marginal effectiveness of fiscal interventions. Thus, the structural overreliance on oil makes fiscal policy procyclical and less responsive to development-oriented objectives (Ewetan, Osabohien & Matthew, 2020). The implication of the findings is that the systemic impediments shape how fiscal policy shocks translate into growth outcomes in practice and therefore, asymmetric modeling yields improved empirical specificity.

On the other side, recurrent expenditure component is seen to have contributed immensely to poverty reduction in Nigeria than capital expenditure component. The need to augment

expenditure provision for general administration cannot be overemphasized as it is shown from the result that it has poverty reducing effect. Much emphasis is therefore on capital expenditure for its leading role in poverty reduction strategy due to its long-term strides in infrastructural development that would engender income generation and job creation opportunities. Again, Nigerian stock market performance indicates that fiscal policy changes have asymmetric effects on financial performance, with positive shocks enhancing stock valuations more than negative shocks, depending on sector or regime (Adeleke & Oyeleke, 2021). The results imply the need for exploring non-homogeneous impacts in macro sectors.

The government as well as non-governmental organisations in Nigeria has undertaken several initiatives to drastically lessen the rate of poverty in the country at large. It was found out by

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Ogwumike, (2021) that erstwhile poverty reduction measures put in place in Nigeria primarily focus primarily on growth, basic necessities and development strategies of rural areas. The country's poverty reduction measures, categorized into pre-SAP, SAP, and democratic eras, include numerous programs and policies. However, the level of poverty remains high, indicating inefficiency or structural defects in the policies. It is germane to emphasize that the study fails to recognize that poverty reduction cannot only be achieved in isolation without having a sizeable number of gainfully employed individuals who are hitherto unemployed. The government's intervention and active participation in an economy is crucial for efficient resource allocation, benefiting the aggregate economy. This is as a result of market failure in which the forces of demand and supply are quite insufficient and ineffective in achieving macroeconomic objectives. One of the most essential instruments employed to influence macroeconomic performance in Nigeria is fiscal policy.

The asymmetric impact of fiscal policy variables on Nigeria's economic growth was investigated by YusuF & Mohd, (2021) and the results reveal that growth responds asymmetrically to recurrent expenditure, while petroleum profit tax and customs levies behave symmetrically but domestic and external debt have uneven long-term effects. Olaniyi & Odhiambo, (2023) use NARDL modeling to examine the asymmetric effects of fiscal deficits on macroeconomic stability in Nigeria. It was found out that in the short run, neither positive nor negative deficit shocks significantly affect GDP. Nevertheless, positive deficits can boost growth in the long run.

METHODOLOGY

In extant empirical literature such as Ewetan, Osabohien & Matthew, (2020); Adeosun, Ayodele & Jongbo, (2021) and Olaniyi & Odhiambo, (2023), economic development can be measured using certain macroeconomic variables which include unemployment rate, poverty rate and Human Development Index (HDI). The study examines the asymmetric impact of fiscal policy on Nigeria's economic development variables. This is done by separating positive and negative shock effects, using modified work of Afandi, Wahyuni & Sriyana, (2019). Also, the theoretical underpinning for this study posits that economic development is generated from within the economic system itself and can be influenced by government policies, following this theoretical position, the baseline model for the study is

$$ECD = f(F) \qquad 1$$

Where, ECD comprises the 3 measures of economic development (Unemployment rate, poverty

rate and HDI) while F connotes the 3 basic fiscal variables (expenditure, revenue and debt). The study adopts a three- equation model and the each of the models is presented in an estimable form as

Model 1: Unemployment

$$UNE_t = \alpha_0 + \alpha_1 F_t + \alpha_2 POP_t + \alpha_3 INT_t + \varepsilon_{1t} \qquad 2a$$

Where, UNE_t is the unemployment, total (% of total labour force) and $F_t$implies fiscal policy variables comprising expenditure (EXP_t) revenue (REV_t) and debt (DBT_t).

That is, $F_t = \alpha_{11} EXP_t + \alpha_{12} REV_t + \alpha_{13} DBT_t$

Model 2: Poverty

$$POV_t = \beta_0 + \beta_1 F_t + \beta_2 POP_t + \beta_3 INF_t + \varepsilon_{2t} \qquad 2b$$

Where, POV_t is poverty rate (measured by multi-dimensional poverty index)

Model 3: Human Development Index (HDI)

$$HDI_t = \varphi_1 + \beta_1 F_t + \varphi_2 POP_t + \varphi_3 INF_t + + \varepsilon_{3t} \qquad 2c$$

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Where, HDI_t is the Human Development Index (HDI) – ranges from 0 to 1- which measures a country's performance in national human development, with higher values indicating better outcomes.

The paper uses the Non-linear Autoregressive Distributed Lag (NARDL) model to examine the asymmetric impact of fiscal policy instruments on economic development. The model captures potential short- and long-run asymmetries, allowing for separate analysis of the effects of positive and negative changes on dependent variables as

$$F_t^{+} = \sum_{i=1}^{p} \Delta F_t^{+} = \sum_{i=1}^{p} Max(\Delta F_t^{+}, 0) \qquad 3a$$

$$F_t^{-} = \sum_{i=1}^{p} \Delta F_t^{-} = \sum_{i=1}^{p} Min(\Delta F_t^{-}, 0) \qquad 3b$$

It is assumed that the effects of $F_t > 0$ (positive) could be different from the effects of $F_t < 0$ (negative). Thus, asymmetric cointegration becomes

Model 1: Unemployment

$$UNE_t = \alpha_0 + \alpha_1^{+} F_t^{+} + \alpha_2^{-} F_t^{-} + \alpha_3 POP_t + \alpha_4 INT_t + \varepsilon_{1t} \qquad 4a$$

Model 2: Poverty

$$POV_t = \beta_0 + \beta_1^{+} F_t^{+} + \beta_2^{-} F_t^{-} + \beta_3 POP_t + \beta_4 INF_t + \varepsilon_{2t} \qquad 4b$$

Model 3: Human Development Index (HDI)

$$H_t = \varphi_1 + \varphi_1^{+} F_t^{+} + \varphi_2^{-} F_t^{-} + \varphi_3 POP_t + \varphi_4 INF_t + \varepsilon_{3t} \qquad 4c$$

Then, by incorporating the economic development variables used in this study, equations 4a to c become

Model 1: Unemployment

$$\Delta UNE_t = \alpha_0 + \sum_{i=0}^{P_1} \alpha_{1i} \Delta UNE_{t-1} + \sum_{i=0}^{P_2} \alpha_{2i}^{+} \Delta F_{t-1}^{+} + \sum_{i=0}^{P_3} \alpha_{3i}^{-} \Delta F_{t-1}^{-} + \sum_{i=0}^{p_4} \alpha_{4i} \Delta POP_{t-1} + \sum_{i=0}^{p_5} \alpha_{5i} \Delta INT_{t-1} + \rho_0 UNE_{t-1} + \rho_1^{+} F_{t-1}^{+} + \rho_2^{-} F_{t-1}^{-} + \rho_3 POP_t + \rho_4 INT_t + \varepsilon_{1t} \qquad 5a$$

Model 2: Poverty

$$\Delta POV_t = \alpha_0 + \sum_{i=0}^{P_1} \alpha_{1i} \Delta POV_{t-1} + \sum_{i=0}^{P_2} \alpha_{2i}^{+} \Delta F_{t-1}^{+} + \sum_{i=0}^{P_3} \alpha_{3i}^{-} \Delta F_{t-1}^{-} + \sum_{i=0}^{p_4} \alpha_{4i} \Delta POP_{t-1} + \sum_{i=0}^{p_5} \alpha_{5i} \Delta INF_{t-1} + \rho_0 POV_{t-1} + \rho_1^{+} F_{t-1}^{+} + \rho_2^{-} F_{t-1}^{-} + \rho_3 POP_t + \rho_4 INF_t + \varepsilon_{2t} \qquad 5b$$

Model 3: Human Development Index (HDI)

$$\Delta HDI_t = \alpha_0 + \sum_{i=0}^{P_1} \alpha_{1i} \Delta HDI_{t-1} + \sum_{i=0}^{P_2} \alpha_{2i}^{+} \Delta F_{t-1}^{+} + \sum_{i=0}^{P_3} \alpha_{3i}^{-} \Delta F_{t-1}^{-} + \sum_{i=0}^{p_4} \alpha_{4i} \Delta POP_{t-1} + \sum_{i=0}^{p_5} \alpha_{5i} \Delta INF_{t-1} + \rho_0 HDI_{t-1} + \rho_1^{+} F_{t-1}^{+} + \rho_2^{-} F_{t-1}^{-} + \rho_3 POP_t + \rho_4 INT_t + \varepsilon_{3t} \qquad 5c$$

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From the right hand side, the first part of the equations (5a – c) with $\sum_{i=0}^{P_i} \alpha_i$ indicate the short run component while remaining part is the long run component, where, $\alpha_1 - \alpha_4$ are short run coefficients estimated and $\rho_1 - \rho_3$ are estimable long run coefficients. After estimating equations 5a to c, then, the following assumptions were tested for the purpose of this analysis.

i. Short-run adjustment asymmetry are inferred if the following ΔF_t^{+} and ΔF_t^{-} take different lag orders respectively;
ii. Short run asymmetric impacts are manifested if they occur at the similar lag order i, the estimate of α_{2i}^{+} is different from the estimate of α_{3i}^{-};
iii. Short run cumulative asymmetric effects are established if $\sum \hat{\alpha}_{2i}^{+} \neq \sum \hat{\alpha}_{3i}^{-}$;
iv. Long run asymmetric impact is inferred if the normalized long-run estimates obtained for all the decomposed partial cumulative sums of positive are different from their respective negative changes i.e. $\frac{\hat{\rho}_1^{+}}{-\rho_O} \neq \frac{\hat{\rho}_2^{-}}{-\rho_0}$

The Following equations were used for estimating asymmetric dynamic multiplier effects:

$$K_{b^+} = \sum_{J=0}^{b} \frac{\partial UNE_{t+j}}{\partial F_t^{+}}, \quad K_{b^-} = \sum_{J=0}^{b} \frac{\partial UNE_{t+j}}{\partial F_t^{-}}, b = 1,2,3 \ldots\ldots\ldots \qquad 6a$$

$$K_{b^+} = \sum_{J=0}^{b} \frac{\partial POV_{t+j}}{\partial F_t^{+}}, \quad K_{b^-} = \sum_{J=0}^{b} \frac{\partial POV_{t+j}}{\partial F_t^{-}}, b = 1,2,3 \ldots\ldots\ldots \qquad 6b$$

$$K_{b^+} = \sum_{J=0}^{b} \frac{\partial HDI_{t+j}}{\partial F_t^{+}}, \quad K_{b^-} = \sum_{J=0}^{b} \frac{\partial HDI_{t+j}}{\partial F_t^{-}}, b = 1,2,3 \ldots\ldots\ldots \qquad 6c$$

Noting that $b \to \infty$, $K_{b^+} \to \theta_1^{+}$ and $K_{b^-} \to \theta_2^{-}$

Data Sources

Annual secondary data on poverty rate, unemployment rate, real interest rate, human development index (HDI), debt-to- GDP ratio, revenue as a percentage of GDP, expenditure as a percentage of GDP, inflation rate and population rate of Nigeria from 1981 to 2022 were used. The data were sourced from the World Development Indicators (WDI, 2023); International Monetary Fund (IMF, 2023), United Nations Development Programme (UNDP, 2023) and World Bank Group, (2023).

RESULTS AND FINDINGS

Descriptive Statistics

This section examines the summary statistical features of the data over the period of study (1981 to 2022) to examine the statistical properties of the variables used in this study. The study examines the mean, median, maximum value, minimum value, standard deviation, skewness, kurtosis and Jarque Bera (p-values) descriptive features of variables of interest before employing econometric estimation. Table 1 reports the overview of all the variables

Table 1: Descriptive statistics Results

Variable	Mean	Median	Max	Min.	Std. Dev.	Skewness	Kurtosis	JB P-value
EXP	20.37	16.78	50.95	9.760	10.69	1.590	22.23	0.0515
REV	14.94	15.23	28.80	5.116	5.998	0.328	1.470	0.4794
DBT	59.14	39.48	193.67	7.280	54.09	0.848	5.302	0.0700

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UNE	5.169	3.9743	22.60	3.710	3.217	4.128	7.45	0.1230
POV	0.221	0.1780	0.536	0.009	0.170	0.535	3.967	0.1375
HDI	0.486	0.4841	0.538	0.378	0.038	-0.692	3.603	0.1649
INT	2.929	1.9031	6.778	0.627	2.109	0.557	4.957	0.0838
INF	14.58	13.502	25.01	2.387	6.573	0.085	2.521	0.2834
POP	2.612	2.5942	3.002	2.380	0.126	0.712	4.999	0.0821

Note: EXP, REV, DBT, UNE, POV, HDI, POP and INT represent expenditure as a % of GDP, revenue as a % of GDP, Debt-to-GDP ratio, unemployment rate, Multidimensional Poverty Index, Human Development Index, population growth rate interest paid on public debt and inflation rate respectively**.**

Source*: Authors' Computation From the data extracted From International Monetary Fund (IMF, 2023), World Bank Group, (2023), World Development Indicators (WDI, 2023) and United Nations Development Programme (UNDP, 2023).*

The REV has its median value marginally above the mean value and it implies that the values of these variables Fall to the left tail of probability density in a bell-shaped curve. The variable DBT is more dispersed in as it exhibits a very high variability with the standard deviation values of 54.09. Again, HDI has the least standard deviation value of 0.038 and this suggests that the data are less dispersed; implying there is less variation in the data and that they are reasonably stable and less volatile. However, the remaining variables show that data are moderately close together as there is evidence of minimal variability in their respective indices Therefore, it appears From Table 1 that all of the variables used in the analysis have a normal distribution. The JB (P-values) results suggest that the data are normally distributed and suitable for further analysis. In conclusion, the results of the summary statistics reveal that the statistical properties of the variables used for analysis are considered to be consistent, pretty stable and less volatile (because they exhibit evidence of minimal variability). Also, the data distributions are not symmetric but are normally distributed. The implication of this is that the data can be used for further analysis.

The results of asymmetric effects of fiscal policy on economic development in Nigeria are presented in Table 2.

Table 2: Results of asymmetric effects of fiscal policy on economic development

Method: Non-Linear ARDL Model								
Model 1a (3, 2, 1, 1)			**Model 2a (3, 3, 1, 1)**			**Model 3a (2, 3, 1, 1)**		
Variable	**Co-eff.**	**P-value**	**Variable**	**Co-eff.**	**P-value**	**Variable**	**Co-eff.**	**P-value**
Dep. Variable: UNE			**Dep. Variable: POV**			**Dep. Variable: HDI**		
Short Run Estimate								
D(EXP^+)	0.5744	0.0825	**D(EXP^+)**	0.0216	0.0084	**D(EXP^+)**	-0.1901	0.0969
D(EXP^+(-1))	-2.2344	0.0227	**D(EXP^+(-1))**	-0.0096	0.0044	**D(EXP^+(-1))**	-0.0661	0.0835
D(EXP^+(-	-	0.015	**D(EXP^+(-2))**	-	0.024	**D(EXP^+(**	-	0.048

2))	1.4213	9		0.0652	2	**-2))**	0.0050	7
D(EXP^{+}(-3))	-1.7088	0.0421	**D(EXP^{+}(-3))**	-0.0288	0.0114	**D(EXP^{-})**	0.0133	0.0219
D(EXP^{-})	0.8122	0.1457	**D(EXP^{-})**	0.0116	0.0192	**D(EXP^{-}(-1))**	0.0067	0.0460
D(EXP^{-}(-1))	-0.2308	0.0691	**D(EXP^{-}(-1))**	0.0225	0.0534	**D(EXP^{-}(-2))**	0.0097	0.0136
D(EXP^{-}(-2))	0.7422	0.0366	**D(EXP^{-}(-2))**	0.0314	0.0717	**D(EXP^{-}(-3))**	0.0025	0.1526
DPOP	0.1092	0.0006	**D(EXP^{-}(-3))**	0.0410	0.0096	**DPOP**	-0.1002	0.0126
DINT	0.0125	0.0526	**DPOP**	1.2067	0.0016	**DINF**	-0.2325	0.0906
Note:			**DINF**	2.8725	0.0026			
Model 1b (3, 2, 1, 1)			**Model 2b (3, 2, 1, 1)**			**Model 3b (3, 3, 1, 1)**		
D(REV^{+})	1.7269	0.0827	**D(REV^{+})**	0.1184	0.0202	**D(REV^{+})**	-0.0302	0.0352
D(REV^{+}(-1))	5.0501	0.0538	**D(REV^{+}(-1))**	0.0112	0.0338	**D(REV^{+}(-1))**	-0.0549	0.0422
D(REV^{+}(-2))	1.6418	0.0599	**D(REV^{+}(-2))**	0.0786	0.0200	**D(REV^{+}(-2))**	-0.0093	0.0763
D(REV^{+}(-3))	2.9273	0.0106	**D(REV^{+}(-3))**	0.1524	0.0306	**D(REV^{+}(-3))**	-0.0106	0.0420
D(REV^{-})	-1.3018	0.0192	**D(REV^{-})**	-0.0964	0.0451	**D(REV^{-})**	0.0209	0.0073
D(REV^{-}(-1))	3.2460	0.0517	**D(REV^{-}(-1))**	-0.0010	0.0911	**D(REV^{-}(-1))**	-0.0437	0.1699
D(REV^{-}(-2))	-4.0024	0.0621	**D(REV^{-}(-2))**	-0.1601	0.0998	**D(REV^{-}(-2))**	-0.0521	0.0550
DPOP	2.1022	0.0116	**DPOP**	0.1920	0.0236	**D(REV^{-}(-3))**	-0.0474	0.0418
DINT	0.2325	0.1526	**DINF**	0.1205	0.0086	**DPOP**	-0.1094	0.0009
						DINF	-0.0152	0.0026
Model 1c (2, 3, 1, 1)			**Model 2c (3, 3, 1, 1)**			**Model 3c (3, 2, 3, 1)**		
D(DBT^{+})	0.2251	0.056	**D(DBT^{+})**	0.0010	0.059	**D(DBT^{+})**	0.002	0.000

		4			6		5	8
							-	
D(DBT^+(-1))	0.9637	0.0465	**D(DBT^+(-1))**	-0.0176	0.0202	**D(DBT^+(-1))**	0.0020	0.0115
							-	
D(DBT^+(-2))	0.5250	0.0583	**D(DBT^+(-2))**	-0.0156	0.0262	**D(DBT^+(-2))**	0.0023	0.0005
	-	0.082		-	0.018	**D(DBT^+(-3))**	0.002	0.029
D(DBT^-)	0.5532	7	**D(DBT^+(-3))**	0.0177	8		1	2
							0.000	0.025
D(DBT^-(-1))	-0.5511	0.0885	**D(DBT^-)**	-0.0155	0.0240	**D(DBT^-)**	6	0
	-	0.016			0.092	**D(DBT^-(-1))**	0.002	0.021
D(DBT^--2))	0.3210	5	**D(DBT^-(-1))**	0.0030	4		1	4
D(DBT^-(-3))	- 0.1542	0.300 1	**D(DBT^--2))**	- 0.0016	0.023 9	**D(DBT^--2))**	0.000 3	0.081 6
		0.000	**D(DBT^-(-3))**		0.059		2.022	0.000
DPOP	1.1032	4		0.0010	6	**DPOP**	1	8
							-	
		0.004			0.040		0.108	0.022
DINT	0.1099	6	**DPOP**	2.1056	0	**DINF**	7	6
					0.004			
			DINF	0.1562	0			
Long Run Estimate								
		0.088		-			-	0.057
EXP^+	0.2881	9	EXP^+	0.0393	0.0701	EXP^+	0.0101	4
		0.050					-	0.031
EXP^-	0.1943	1	EXP^-	0.0233	0.0150	EXP^-	0.0033	5
		0.022		-				0.041
REV^+	-1.8044	5	REV^+	0.0102	0.0352	REV^+	0.0029	0
		0.023		-				0.087
REV^-	-3.0262	5	REV^-	0.0360	0.0259	REV^-	0.0045	8
		0.078						0.000
DBT^+	-0.0821	6	DBT^+	0.0063	0.0232	DBT^+	0.0018	1
		0.085						0.000
DBT^-	-0.0612	8	DBT^-	0.0017	0.0214	DBT^-	0.0007	3
		0.096		-			-	0.025
POP	-6.5927	8	**POP**	0.0415	0.0617	**POP**	0.2152	2
		0.003					-	0.004
INT	0.1929	6	**INF**	0.1099	0.0776	**INF**	1.1002	2
		0.005						0.015
C	6.7797	3	**C**	4.0458	0.0325	**C**	1.3785	3

Source: Author's estimations

The results in Table 2 above contain the short run estimates (in the first three upper components) and the long run estimates (in the last component). The short run estimates reveal the asymmetric effects of each of fiscal variables (expenditure, revenue and debt) on each of the economic development variables (unemployment rate, poverty rate and HDI). The lag lengths for each of the models (1a,b,c to 3a,b,c) are all indicated just above the results in Table

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Results from Table 2 For Model 1 show that the signs of D(EXP^+) coefficients are mostly negative at different magnitudes. This shows that the effects of a positive shock to government expenditure on unemployment in Nigeria vary in the short run. These effects were found to be statistically significant. Also, the cumulative effects of the positive shocks to government expenditure on unemployment in Nigeria were found to be negative in the short run. Again, the signs of D(EXP^-)

coefficients are varied with dissimilar magnitudes and are statistically significant at different levels. The cumulative effects of the negative shocks to the government expenditure on unemployment are positive.

Furthermore, the results show that the effect of a positive shock to government revenue {D(REV^+)} on unemployment in Nigeria was Found to be positive. All these effects were found to be statistically significant. Also, the cumulative effects of the positive shocks to the government revenue on unemployment appeared be positive in the short run. Again, the coefficients of D(REV^-) are different in signs but with different magnitudes and statistically significant at different levels. The cumulative effects of the negative shocks to the government revenue on unemployment were found to be positive in the short run.

The third fiscal variable in the model is debt-to-GDP ratio (DBT), it is revealed that the estimates the signs of D(DBT^+) coefficients are all positive with different magnitudes. This shows that, in the short run, the effects of positive shocks to government debt on unemployment in Nigeria were found to be positive and these effects are statistically significant. Also, the cumulative effects of the positive shocks to the government debt on unemployment appeared positive in the short run. Again, the coefficients of D(DBT^-) are all negative and with different magnitudes and statistically significant at different levels. The cumulative effects of the negative shocks to the government revenue on unemployment were found to be positive in the short run. It is also shown that population growth rates (DPOP) and interest rate (DINT) confer significant positive relationship on unemployment in each of the three models in the short run. Again, population growth rate (POP) showed an estimated co-efficient of -6.5927. This implies that a 1% increase in population growth rate leads to 6.5927% fall in unemployment rate in Nigeria. The co-efficient is statistically significant at 1% level. This implies that an increase in population growth can lead to a decrease in unemployment.

In Model 2 Table 2, it is quite apparent that the coefficients of D(EXP^+) are mostly negative but at diverse magnitudes. This shows that, in the short run, the effects of positive shocks to government expenditure on poverty in Nigeria are negative. Also, the cumulative effects of the positive shocks to government expenditure on poverty level in Indonesia are negative in the short run. Conversely, the signs of D(EXP^-) coefficients are all positive with different magnitudes. The cumulative effects of the negative shocks to the government expenditure on poverty rate are found to be negative in the short run.

Similarly, the results show that the estimates the signs of D(REV^+) coefficients are all positive and with different magnitudes. This shows that, in the short run, the effect of positive shocks to government revenue on poverty level in Nigeria was found to be positive. All these effects were found to be statistically significant. Then, the cumulative effects of the positive shocks to the government revenue on poverty appeared positive in the short run. Again, the signs of D(REV^-) coefficients are all negative but with different magnitudes and statistically significant

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at different levels. The cumulative effects of the negative shocks to the government revenue on poverty are found to be positive in the short run.

Again, the coefficients of $D(DBT^{+})$ are negative with different magnitudes. This shows that, in the short run, the effects of positive shocks to government debt on poverty in Nigeria were found to be negative and these effects are statistically significant. Also, the cumulative effects of the positive shocks to the government debt on poverty were found to be negative in the short run. Again, the signs of $D(DBT^{-})$ coefficients are mostly negative and with different magnitudes and statistically significant at different levels. The cumulative effects of the negative shocks to the government debt on poverty in Nigeria were found to be positive in the short run. It is equally revealed that population growth rates (DPOP) and inflation rate (DINF) confer significant positive relationship on poverty level in each of the three models in the short run. Contrary to the short run estimates, the results of the long run estimates depict that a positive shock to government expenditure confers a negative non-linear impact on poverty while a negative shock to government expenditure confers a positive non-linear impact on poverty level in Nigeria. The results of the long run estimates of debt-to-GDP ratio indicate a significant positive relationship between shocks to government debt and poverty in Nigeria. The results reveal that both positive and negative shocks to government debt confer a significant positive non-linear impact on poverty level.

In Model 3 Table 2, it is glaringly clear that the coefficients of $D(EXP^{+})$ are all negative but at different magnitudes. This shows that, in the short run, the effects of positive shocks to government expenditure on HDI in Nigeria are negative. Also, the cumulative effects of the positive shocks to government expenditure on HDI in Nigeria are negative in the short run. Also, the signs of $D(EXP^{-})$ coefficients are all positive with different magnitudes. The cumulative effects of the negative shocks to the government expenditure on HDI are found to be negative in the short run. Moreover, the signs of the coefficients $D(REV^{+})$ are all negative with different magnitudes while the cumulative effects of the positive shocks to the government revenue on HDI in Nigeria were found to be negative in the short run. Again, the signs of $D(REV^{-})$ coefficients are both positive and negative but with different magnitudes and statistically significant at different levels. The cumulative effects of the negative shocks to the government revenue on HDI were found to be negative in the short run.The results for the estimates of the signs of $D(DBT^{+})$ coefficients are both positive and negative with different magnitudes. Also, the cumulative effects of the positive shocks to the government debt on HDI appeared positive in the short run. Again, the coefficients of $D(DBT^{-})$ are all positive and with different magnitudes and statistically significant at different levels. The cumulative effects of the negative shocks to the government debt on HDI in Nigeria were found to be positive in the short run. Again, population growth rates (DPOP) and inflation rate (DINT) confer significant negative relationship on HDI in each of the three models in the short run.

Again, the results of the long run estimates indicate significant negative relationship between shocks to government expenditure and HDI in Nigeria. The results reveal that both positive and negative shocks to government expenditure confer a significant negative non-linear impact on HDI in Nigeria. Also, the results of the long run estimates indicate a significant positive relationship between shocks to government revenue and HDI in Nigeria. The results reveal that both positive and negative shocks to government revenue confer a significant positive non-linear impact on HDI in Nigeria.

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Discussion of Results

The results indicate a positive relationship between shocks to government expenditure and unemployment in Nigeria. The results reveal that both the positive and negative shocks to government expenditure confer a significant positive non-linear impact on unemployment. This implies that a positive shock to government expenditure can enhance economic activity through increased demand, infrastructure investment and job creation. While a negative shock to unemployment can result in an unexpected decline in unemployment rates due to increased hiring, enhanced economic conditions and or effective government policies. This is in line with the Keynesian economics which suggests that increased government expenditure boosts aggregate demand, leading to increased production and employment in Nigeria.

The analysis of debt-to-GDP ratio point out a significant negative relationship between shocks to debt and unemployment. It is shown that both positive and negative shocks to public debt confer a significant negative non-linear impact on unemployment in Nigeria. This implies that positive shocks from debt can arise from expansionary fiscal policies, which soar up spending or diminish taxes to stimulate economic activity. These policies can initially reduce unemployment by creating jobs through public projects or indirectly by boosting demand. However, the negative non-linear impact suggests that further increases may have diminishing returns due to concerns about Fiscal sustainability, potential crowding out of private investment, or inflationary pressures. Also, excessive reliance on debt-financed stimulus without corresponding increases in productivity or revenue generation can lead to long-term economic imbalances, undermining employment prospects in Nigeria. The results are in consonance with the conclusion of Reinhart and Rogoff, (2020) which suggest a nonlinear relationship between public debt levels and economic development, with positive effects on growth when debt levels are low and negative when they increase.

The results imply that in Nigeria, a positive shock to government expenditure can initially lead to poverty reduction through increased spending on social programs and infrastructure development. However, this may diminish over time due to factors like inefficiencies, corruption, and infrastructure inefficiency. Beyond a certain threshold, excessive spending could exacerbate poverty levels, leading to inflationary pressures, fiscal deficits, and macroeconomic instability. Conversely, a negative shock to government expenditure could exacerbate poverty levels by reducing access to essential social programs and public services. In the long run, reduced government expenditure could become less severe or even positive, if fiscal consolidation measures lead to improved macroeconomic stability, reduced inflation, and increased investor confidence. Over the long term, communities and individuals may adapt to changes in government expenditure patterns, Finding alternative income sources or social support. The results are in consonant with the findings of **Saraireh, (2020) which** show that public spending and poverty rate are interrelated; and that any increase in public expenditure decreases the poverty rate in the long run.

Again, on the asymmetric effect of revenue on economic development, the results indicate a significant positive relationship between shocks to government revenue and poverty in Nigeria. It is revealed that both positive and negative shocks to government revenue confer a significant

positive non-linear impact on poverty level. The implication of the results is that the association between government revenue shocks and poverty in Nigeria is not insignificant, with both positive and negative shocks having a non-linear impact. Positive shocks provide the government with additional resources to invest in social programmes, infrastructure, and

poverty alleviation initiatives. However, in the long run, the impact may diminish due to inefficiencies, corruption, or failure to generate sustainable economic growth. Negative shocks may lead to inflation, fiscal mismanagement, and economic distortions. Nigeria, heavily reliant on government revenue, should diversify revenue sources, improve fiscal management, invest in human capital, and strengthen social safety nets to mitigate economic shocks and promote inclusive growth. The results are in line with findings of Musa, Asare & Gulumbe, (2019) which found out that despite government revenue impacting growth, the unprecedented rise in general prices continues to eat deep into the economy.

Again, the study reveals a positive relationship between government revenue shocks and the Human Development Index (HDI), suggesting that increased revenue can positively impact human development outcomes in Nigeria. Higher government revenue allows states to allocate resources to essential public services, such as education, healthcare, infrastructure, and social welfare programmes, towards fostering economic growth, improving quality of life, and addressing social inequalities. The study emphasizes the importance of implementing policies that enhance revenue mobilization and fiscal capacity, such as broadening the tax base and diversifying revenue sources. It also emphasizes the need for sustainable fiscal policies to maintain macroeconomic stability. Overall, the study underscores the importance of government revenue mobilization and fiscal policy in promoting human development outcomes in Nigeria. The results are in line with findings of the work of Adekola & Asaleye, (2020) which highlight the crucial role of stable fiscal policies in enhancing economic development in Nigeria.

It is equally implied that positive shocks to debt-to GDP ratio can provide the Nigeria's government with additional funds to invest in poverty alleviation programmes, social services and infrastructure development. However, in the long run, the impact may diminish due to debt sustainability concerns. Also, potential negative effects may include macroeconomic instability, inflationary pressures, and reduced investor confidence. Again, negative shocks may lead to austerity measures, spending cuts, and reduced investment in social programmes and in the long run, the negative impact may persist. In the same vein, the positive relationship between inflation rate and poverty level indicate that the higher the rate of inflation the lower the peoples purchasing power and the higher the rate of poverty and vice versa. These support the Findings of Boskin, (2020) which conclude that increases in the debt-to-GDP ratio and high inflation rate may result in greater taxes and decreased future earnings and low standard of living as well as rise in poverty rate.

The negative relationship between government spending shocks and the Human Development Index (HDI) indicates suboptimal effectiveness and efficiency of public spending in Nigeria. The non-linear impact suggests that the impact of government expenditure shocks on HDI is not uniform across all levels of expenditure changes. The findings emphasize the importance of Fiscal sustainability and prudent Fiscal management in Nigeria. The results are in line with findings of

Farayibi & Owuru, (2022) long-term impact of ineffective public spending can undermine economic performance if it is not optimally utilized.

In the same vein, there exists a significant positive relationship between shocks to public debt and HDI in Nigeria. The results reveal that both positive and negative shocks to public debt confer a significant positive non-linear impact on HDI in Nigeria. The study reveals a positive

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relationship between public debt shocks and the Human Development Index (HDI), suggesting that public debt can be used as a financing tool for investments in human capital, infrastructure, and social services. The study emphasizes the importance of prioritizing investments in key sectors that directly impact human development outcomes. The findings suggest that Nigeria can harness the positive impact of public debt on HDI and accelerate progress towards sustainable development goals. The findings are supported by the conclusion of the work of Nasa, (2019) that higher debt-to-GDP ratios lead to lower long-term growth rates, while lower ratios promote economic development, signifying a positive association between debt and economic development. Also, the negative relationship between inflation rate and HDI indicate that inflation can negatively impact life expectancy by increasing healthcare costs and leading to malnutrition, especially in food prices, which can be less accessible to the poor masses.

Dynamic Multiplier Graphs of NARDL Estimates of Model 1

The Dynamic Multiplier graphs of NARDL estimates of the three threshold variables in Model 1 are presented in the Figure 1.

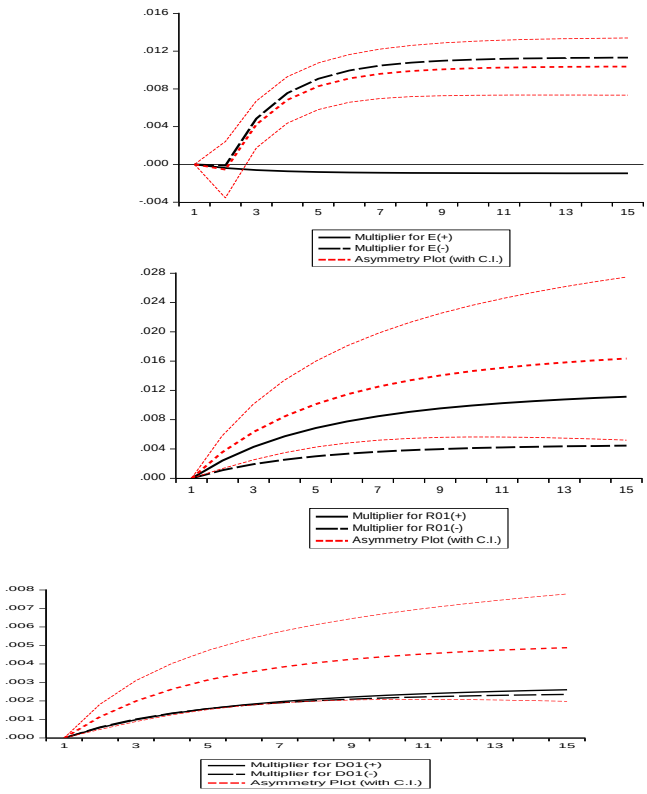

Figure 1: Dynamic Multiplier Graphs of NARDL Estimates of Fiscal Policy Instruments of Model 1

Source: Authors' graphical illustration

From Figure 1(i), the study reveals asymmetric relationship between Nigeria's unemployment adjustment and negative and positive shocks of expenditure (EXP), indicating an asymmetry between unemployment and government expenditure. On the contrary, from Figure 1 (ii), the results reveal that Nigeria's unemployment rate (UNE) indicates no evidence of asymmetry in the relationship with government revenue. Similarly, the results of asymmetric unemployment

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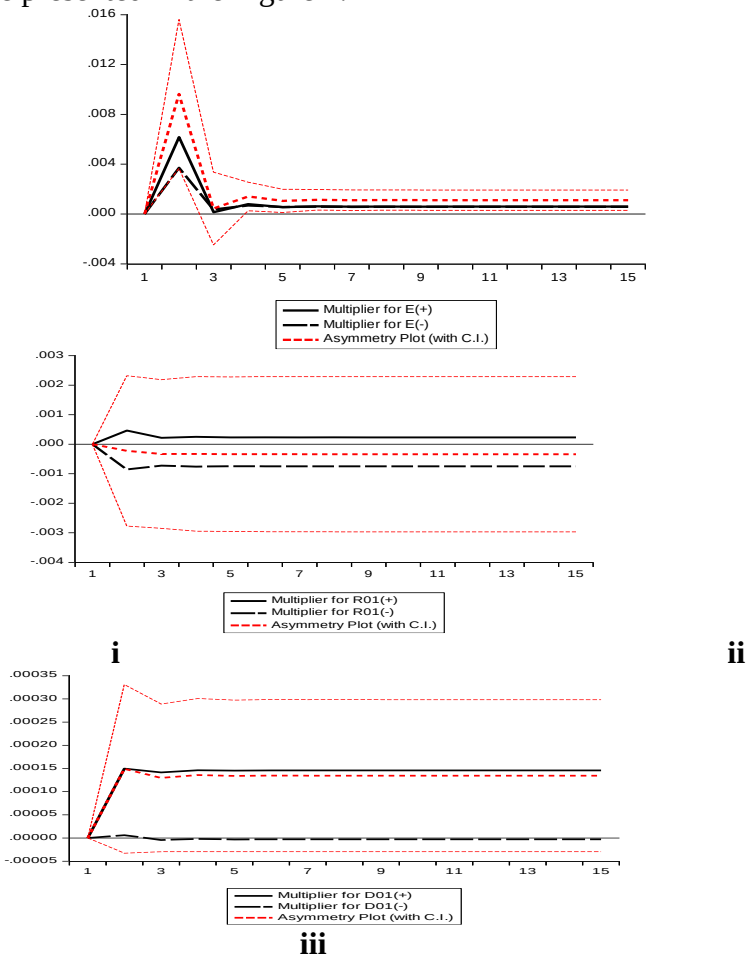
adjustment to positive and negative debt – to - GDP (DBT) shocks is shown in Figure 1 (iii) by the DBT-negative and positive shocks. The study reveals that in Nigeria, the relationship between debt-to-GDP and unemployment rate is not asymmetric in both short and long terms, indicating a consistent response to shocks.

Dynamic Multiplier Graphs of NARDL Estimates of Model 2

The Dynamic Multiplier graphs of NARDL estimates of the three threshold variables in Model 2 are presented in the Figure 2.



i **ii**

iii

Figure 2: Dynamic Multiplier Graphs of NARDL Estimates of Fiscal Policy Instruments of Model 2

Source: Authors' graphical illustration

Figure 2(i) reveals asymmetric relationship between Nigeria's poverty rate adjustment and expenditure shocks, showing that POV responds proportionally to both short and long-term shocks from EXP. This indicates that there is no evidence of asymmetry in both short- and long run relationships between government expenditure and poverty rate in Nigeria. On the contrary, Figure 2 (ii) shows asymmetry between poverty rate and government revenue in Nigeria, with positive REV components negatively impacting POV and negative components positively impacting POV in both short and long run. In the same vein, the results of asymmetric unemployment adjustment to positive and negative debt-to-GDP (DBT) shocks is shown in Figure 2 (iii) by the DBT-negative and positive shocks. The study shows that Nigeria's debt-to-GDP ratio reacts more to positive shocks in both short and long terms, indicating a stable and predictable fiscal policy in the long run, despite no evidence of asymmetry in the short and

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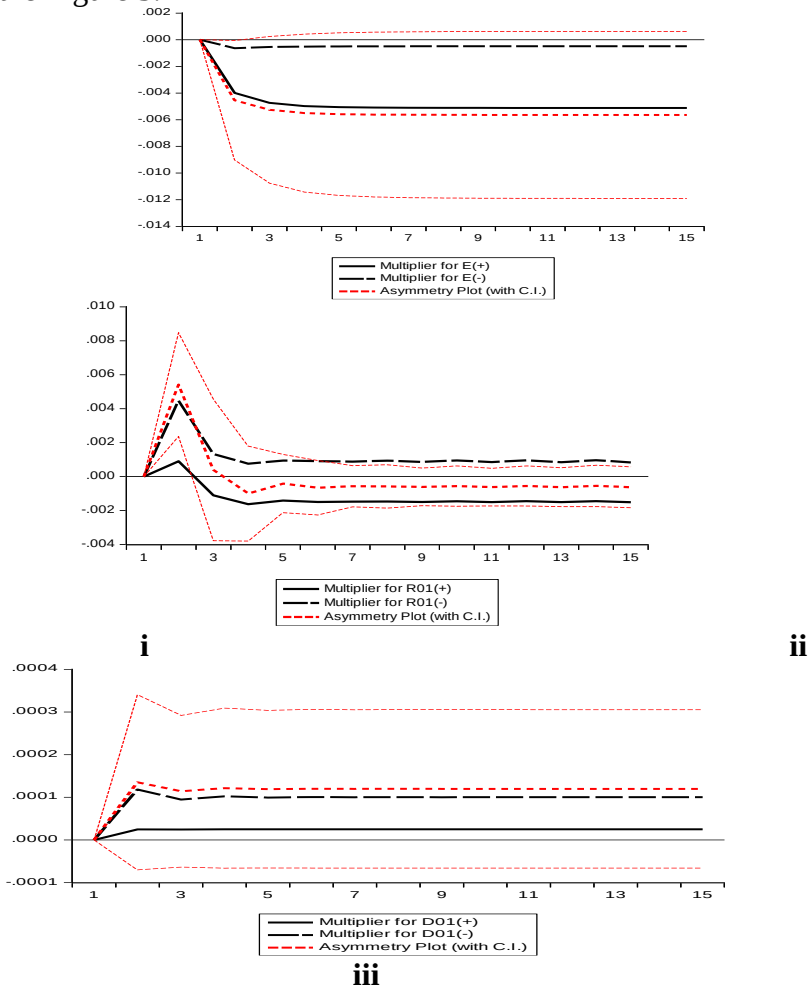
long run.

Dynamic Multiplier Graphs of NARDL Estimates of Model 3

The Dynamic Multiplier graphs of NARDL estimates of the three threshold variables in Model 3 are presented in the Figure 3.



i **ii**

iii

Figure 3: Dynamic Multiplier Graphs of NARDL Estimates of Fiscal Policy Instruments of Model 3

Source: Authors' graphical illustration

It is indicated from Figure 3(i) that Nigeria's Human Development Index (HDI) adjusts more significantly to positive shocks from government expenditure (EXP) than negative shocks in both short and long run, indicating no evidence of asymmetry in the relationship between government expenditure and HDI. On the contrary, Figure 3 (ii) shows asymmetry between the Human Development Index and government revenue in Nigeria, with both positive and negative components of REV negatively impacting HDI, indicating a long-term imbalance in the relationship. Again, the results of asymmetric HDI adjustment to positive and negative debt-to-GDP (DBT) shocks is shown in Figure 3 (iii) by the DBT-negative and positive shocks. The study shows that in Nigeria, the debt-to-GDP ratio (DBT) reacts more to negative shocks than positive shocks, indicating no asymmetry in the relationship between these variables.

Diagnostic Tests for the Non-linear ARDL

Diagnostic tests were conducted on the Non-linear version of ARDL for the three models to ensure its reliability, and they include residual diagnostic tests of normality, serial correlation,

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heteroskedascity, and Ramsey RESET test. The results are presented in Table 3.

Table 3: Diagnostic tests results of Non-linear ARDL

Diagnostic Tests	Model 1		Model 2		Model 3	
Jarque-Bera Test for Normality	0.5463	(0.7609)	0.7659	(0.6818)	0.2289	(0.8829)
Breusch-Godfrey Serial Correlation LM Test	9.3096	(0.1517)	0.8717	(0.4591)	2.4755	(0.2318)
Ramsey RESET Test	6.7830	(0.3700)	0.2391	(0.6380)	8.3972	(0.2200)
Heteroskedasticity Test:Breusch-Pagan-Godfrey	0.2595	(0.9921)	0.6995	(0.7752)	0.5004	(0.8934)

Source: Authors' estimation

The Jarque-Bera test for Normality assesses the normality of residuals in regression models for ensuring data skewness and kurtosis match a normal distribution. If p-values exceed 0.05, the null hypothesis (H_0) is accepted, indicating regression models' reliability. Alternative approaches may be considered for validity. The Breusch-Godfrey Serial Correlation LM Test detects serial correlation in regression model residuals, ensuring accurate regression coefficient estimation. Ramsey's RESET test assesses specification error in regression models, confirming linear specification is adequate. These tests enhance regression analysis reliability, allowing accurate coefficient interpretation, reliable predictions, and confident hypothesis testing. The Breusch-Pagan-Godfrey Heteroskedasticity test confirms the absence of heteroskedasticity in the three models, indicating unbiased and consistent estimators since the test statistic's p-value is greater than a suitable threshold of ($p < 0.05$). Thus, the diagnostic tests on the Non-linear version of ARDL models show no issues with serial correlation, heteroscedasticity and normality.

CONCLUSION

The findings of this paper indicate that positive government expenditure shocks stimulate economic activity by stimulating aggregate demand, promoting infrastructure development, and job creation while negative unemployment shocks suggest improved hiring practices, favorable economic conditions, or proactive government interventions can effectively reduce unemployment. Also, excessive fiscal policies financed by public debt initially reduce unemployment but may become counterproductive, leading to fiscal sustainability concerns and inflationary pressures. Moreover, Nigeria's government revenue shocks considerably impact poverty, with positive shocks reducing poverty through public investments, while negative shocks exacerbate it through inflation and fiscal constraints. Rising government expenditure, revenue and debt in Nigeria positively impacts human development indicators like education, healthcare and social welfare towards enhancing sustained growth and development. It is therefore concluded that fiscal policy instruments confer significant asymmetric effects on economic development in Nigeria. Following the findings of this paper, it is recommended that policymakers should adopt expansionary fiscal policy during economic downturns to sustain low unemployment and poverty rates as well as low HDI. Also, a prudent debt management strategy is suggested to balance fiscal stimulus with long-term sustainability, while revenue diversification beyond oil to improve tax administration, and encourage sector expansion is encouraged.

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