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FISCAL POLICY ASYMMETRIES AND ECONOMIC PERFORMANCE IN SELECTED ECOWAS ECONOMIES

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Abstract *This study investigates the asymmetric impacts of government revenue and expenditure on the Economic Performance Index (EPI) in six selected ECOWAS countries. Utilising annual panel data, the study employs a Panel Nonlinear Autoregressive Distributed Lag (P-NARDL) model estimated via the Pooled Mean Group (PMG) framework to capture structural nonlinearities. Panel unit root tests validate the P-NARDL methodology, revealing a mixed order of integration. The empirical results confirm a stable long-run cointegrating relationship among the variables, with a robust group-wide speed of adjustment (ECT = -0.6762, $p < 0.01$). Long-run estimations show that both positive and negative innovations in government revenue exert a statistically significant, negative impact on economic performance, proving that distortionary tax hikes and capacity-limiting revenue shortfalls are equally detrimental to growth. Conversely, government expenditure exhibits a positive relationship with the EPI: positive expenditure shocks significantly enhance the index ($p < 0.05$), while negative expenditure shocks also lift the index by signalling fiscal optimisation through the contraction of wasteful recurrent outlays. Formal Wald tests confirm the presence of statistically significant long-run and joint structural asymmetries, though short-run dynamics remain symmetric. The study concludes that the macroeconomic transmission of fiscal policy depends fundamentally on the structural quality of revenue mobilisation and the operational efficiency of public spending, rather than the mere volume of fiscal operations. Policy implication: Broaden tax base, not rates. Prioritize capital spending and cut recurrent waste.*

Keywords Fiscal Policy Asymmetry, Economic Performance Index, P-NARDL, Pooled Mean Group, ECOWAS Countries

INTRODUCTION

Discussions on the role of fiscal policy as a critical instrument for promoting economic performance were reignited by the Great Depression of the 1930s, culminating in the publication of Keynes' The General Theory of Employment, Interest and Money (1936). Since then, the application of fiscal policy and its importance have attracted considerable attention in economic research worldwide. However, empirical evidence on its asymmetric effects on economic

performance, particularly in developing economies such as the member states of the Economic Community of West African States (ECOWAS), remains inconclusive. This study empirically investigates the asymmetric effects of fiscal policy on economic performance in the selected ECOWAS countries.

Different schools of thought have long debated the most effective fiscal policy instruments for managing the economy in an increasingly globalised world. Although fiscal policy is often viewed as having a limited short-term stabilisation role (Obademi, 2018), it remains a critical tool for achieving long-term macroeconomic stability and sustainable economic growth. Fiscal policy influences macroeconomic stability (Batra & Mahmood, 2018), infrastructure investment (Esfahani & Ramírez, 2023), human capital development (Psacharopoulos & Patrinos, 2018), poverty reduction (Banerjee, 2015), and inclusive growth (Aghion, 2019), making it indispensable to Nigeria's economic development. Furthermore, prudent fiscal management, encompassing efficient public expenditure, effective revenue mobilisation, and debt sustainability, promotes macroeconomic stability and creates an enabling environment for investment, thereby supporting the attainment of sustainable economic development (Banerjee, 2015).

In many industrialised economies, significant changes in government spending and taxation policies have contributed to persistent budget deficits and weakened fiscal balance (Panagiotis,2026). From a theoretical perspective, the Keynesian school argues that expansionary fiscal policy stimulates aggregate demand and increases output through positive multiplier effects. In contrast, the neoclassical school maintains that expansionary fiscal policy may crowd out private investment and produce a weak or even negative multiplier effect on output. Although this debate remains unresolved, recent research has increasingly shifted the focus of debate toward determining whether fiscal policy is more effective during economic expansions or periods of economic slack.

A growing body of empirical literature has examined whether the size and sign of fiscal multipliers are nonlinear (Chian Koh, 2016; Honda et al., 2020; Ilzetzki et al., 2013; Ramey & Zubairy, 2018). The findings generally suggest that discretionary fiscal policy exerts varying effects across different phases of the business cycle, with stronger effects during economic downturns than during expansions. Furthermore, fiscal policy may have asymmetric effects on investment and consumption over the course of the business cycle. Depending on prevailing economic conditions, government spending shocks can either stabilise or destabilise the economy (Kandil, 2001).

According to Kandil (2001), expansionary government spending shocks significantly increase interest rates when the economy is operating close to full-capacity utilisation. Under such conditions, higher government spending tends to crowd out private consumption and discourage private investment. Conversely, when the economy is operating below full-capacity utilisation, expansionary government expenditure is more likely to stimulate aggregate demand without causing a substantial increase in interest rates. In this situation, lower

borrowing costs help offset the expected increase in future tax liabilities required to finance higher government spending, thereby enhancing the effectiveness of fiscal expansion.

A significant structural revenue mobilization shortfall is confirmed by the ECOWAS average tax-to-GDP ratio of 14%, which is significantly lower than the Sub-Saharan African (SSA) average of 25%. This deficit restricts fiscal freedom, making countries more susceptible to shocks and limiting vital public investments in social services and infrastructure (IMF, 2023). The average total government revenue-to-GDP ratio for ECOWAS nations was anticipated to be between 15% and 17% in 2023. This was slightly less than the average for Sub-Saharan Africa (SSA), which was between 16.1% and 16.5% of GDP during the same period (OECD, 2023).

Structural Vector Autoregression (SVAR) models have been the dominant methodological approach in studies examining the output effects of fiscal policy in a number of Sub-Saharan African (SSA) countries. For example, Gereziher and Nuru (2019) employed an SVAR model to estimate the impulse response of fiscal policy in Ethiopia; Mahrous (2016) investigated the impact of government spending on economic growth in Kenya. Similarly, Olaoye et al. (2020) employed a nonlinear regression model alongside a linear fiscal reaction function to examine the asymmetric effects of fiscal policy on economic growth in Nigeria.

Despite these contributions, the empirical evidence for SSA remains inconclusive because existing studies report widely varying estimates of fiscal multipliers across countries. Moreover, limited attention has been paid to the asymmetric effects of fiscal policy shocks in the Economic Community of West African States (ECOWAS), particularly regarding the transmission channels through which these shocks affect economic performance, despite their growing importance in contemporary policy debates.Against this backdrop, the present study investigates the asymmetric effects of fiscal policy shocks on economic performance in the selected ECOWAS countries. It also examines whether alternative fiscal instruments, such as tax reductions and increases in government expenditure, are theoretically equivalent in their macroeconomic outcomes. The study focuses on the six ECOWAS member states: The Gambia, Ghana, Guinea, Liberia, Nigeria, and Sierra Leone.

Using data for the period 2000–2024, this study examines the asymmetric effects of fiscal policy on economic performance in selected ECOWAS economies, recognising the size and dynamics of fiscal multipliers across different phases of the business cycle.

The remainder of this paper is organised as follows. Section 2 reviews the relevant literature, Section 3 describes the methodology and data, Section 4 presents the empirical results and discussion, and Section 5 concludes the study and offers policy recommendations.

2. LITERATURE REVIEW

2.1 Theoretical Review

The Keynesian theory of fiscal policy, advanced by Keynes in The General Theory

of Employment, Interest and Money (1936), advocatesdeficit-financed fiscal expansion to stimulate economic activity during recessions. Its central proposition is that increased government expenditure and lower interest rates can raise aggregate demand, thereby promoting output and employment. Accordingly, during economic downturns, governments are encouraged to adopt expansionary fiscal policies in which public expenditure exceeds government revenue. The resulting fiscal deficit is typically financed through domestic or external borrowing (Oche, Mah, & Mongale, 2016). While this strategy is intended to stimulate aggregate demand, excessive government borrowing may increase interest rates, raise the cost of capital, crowd out private investment, and ultimately weaken the effectiveness of fiscal policy (Ncanywa & Masoga, 2018).

The theory of asymmetric fiscal policy suggests that the fiscal balance responds differently across phases of the business cycle. According to Hercowitz and Strawczynski (2004), the fiscal balance as a percentage of GDP typically deteriorates during recessions but improves less proportionately during economic expansions, resulting in an asymmetric fiscal response. They argue that a pattern in which government expenditure increases during recessions but is not reduced correspondingly during booms undermines fiscal sustainability. Such asymmetry contributes to persistent budget deficits and rising public debt, with adverse consequences for long-run economic performance.

Calderón and Schmidt-Hebbel (2008) identify two major reasons why many developing countries, particularly those in the Economic Community of West African States (ECOWAS), pursue procyclical fiscal policies despite their destabilising effects. First, shallow domestic financial markets and limited access to international credit constrain governments' ability to borrow during economic downturns. Second, institutional and political factors encourage higher public spending and tax volatility during periods of economic expansion, thereby reinforcing fiscal procyclicality. Similarly, Bertola and Drazen (1993) identify five potential sources of fiscal policy asymmetry: the phase of the business cycle, the public debt-to-GDP ratio, the direction of the fiscal shock, the type of fiscal instrument (government expenditure versus government revenue), and the magnitude of the fiscal shock.

These theoretical perspectives also explain how consumers and investors respond to expansionary fiscal policy. Under the Ricardian Equivalence Hypothesis, forward-looking households anticipate that increases in government expenditure will eventually be financed through higher future taxes. Consequently, they increase savings and reduce current consumption, offsetting the expansionary effects of fiscal policy. By contrast, when households are liquidity-constrained or behave according to non-Ricardian assumptions, increases in government expenditure stimulate private consumption and investment, thereby enhancing the effectiveness of discretionary fiscal policy (Correa et al., 2014).

Consistent with these theoretical predictions, a growing body of empirical evidence indicates that discretionary fiscal policy has stronger effects during economic

contractions than during expansions (Honda et al., 2020; Qazizada & Stockhammer, 2015; Sedighi et al., 2021). During recessions, the presence of excess productive capacity reduces the likelihood that higher public spending will crowd out private expenditure. In addition, liquidity-constrained households exhibit higher marginal propensities to consume, strengthening the transmission of fiscal stimulus to aggregate demand, output, and employment.

2.2 Empirical Review

Shen et al. (2018) examined the effects of government spending shocks in low-income countries (LICs). Their findings indicate that fiscal multipliers are dampened by low home bias in consumption, low marginal efficiency of investment, and a heavy reliance on domestic financing. Similarly, Honda et al. (2020) investigated the output effects of fiscal policy in LICs over the period 1995–2017. The study found that fiscal multipliers in LICs are significantly smaller than those in advanced economies (AEs). However, the output effects become stronger during recessions, particularly in countries operating under fixed exchange rate regimes and exhibiting higher institutional quality.

Tiamiyu, Oseni, Tella, and Babalola (2021) discovered that fiscal policy variables had asymmetric effects on Anglophone ECOWAS economic performance, with positive fiscal shocks having a greater impact than negative shocks. According to Okunlola, Sani, Ayetigbo, and Oyadeyi (2024), productive government spending fosters economic growth in ECOWAS, however its efficacy is dependent on institutional strength and governance quality. Afonso and Jalles (2014) demonstrated how the efficiency and makeup of public spending affect the growth benefits of fiscal policy.

Barro (1990) made the case that infrastructure and public capital accumulation are two ways that effective government spending promotes long-term economic growth.

Mahrous (2016) estimated the government expenditure multiplier for Kenya using quarterly time-series data spanning 1991–2012. The study found that fiscal multipliers in Kenya were relatively small and short-lived. Using a Structural Panel Vector Autoregression (SPVAR) model, Chian Koh (2016) estimated fiscal multipliers for 120 countries over the period 1960–2014. The results show that fiscal multipliers are larger in advanced economies when public debt is low, financial markets are well developed, and the economy is experiencing either a financial crisis or a recession.

Baum and Koester (2012) employed a Threshold Vector Autoregression (TVAR) model to examine the asymmetric effects of fiscal policy on Germany's business cycle. Their linear model produced fiscal multipliers of approximately 0.7 for both government expenditure and revenue, suggesting that both fiscal instruments positively affected output. However, the nonlinear analysis revealed substantial asymmetries across business-cycle phases. The government expenditure multiplier was close to unity during economic expansions but declined to about 0.36 during downturns, indicating that considerably

larger fiscal interventions are required to achieve similar output effects during recessions. In contrast, revenue shocks exhibited weaker cyclical variation, implying that their effects are less sensitive to the business cycle.

Using panel data for 17 OECD countries over the period 1978–2009, Devries, Guajardo, Leigh, and Pescatori (2011) examined the macroeconomic effects of fiscal consolidation through changes in government expenditure and taxation. Their findings suggest that simultaneous adjustments in government spending and revenue are primarily aimed at reducing fiscal deficits. Using nonlinear SVAR models, Auerbach and Gorodnichenko (2013a, 2013b) analysed fiscal multipliers across economic expansions and recessions in the United States and OECD economies, respectively. Their results demonstrate that both the magnitude and effectiveness of fiscal multipliers vary systematically across business-cycle regimes, with considerably larger multipliers during recessions than during expansions.

Qazizada and Stockhammer (2015) compared nonlinear government consumption multipliers across economic booms and recessions for seven advanced economies over the period 1979–2011. To address the endogeneity of government expenditure, the authors employed a Two-Stage Least Squares (TSLS) estimator using lagged government consumption as an instrument. The estimated government consumption multiplier was approximately 1.01 during economic expansions and increased to 3.07 during recessions, indicating that expansionary fiscal policy is substantially more effective during periods of economic slack.

Focusing on selected Sub-Saharan African countries, Ugwuanyi and Ugwunta (2017) examined the effects of fiscal policy variables on economic growth. Their findings indicate that government expenditure and taxation exert significant positive effects on economic growth and that these effects are predominantly symmetric and linear. Similarly, Bello, Wazamari, Stephen, and Shettima (2019), using Nigerian time-series data covering 1981–2016, found that government expenditure had a significant positive effect on economic performance, whereas government revenue exerted a positive but statistically insignificant effect.

3. METHODOLOGY

3.1 Data and Methodological Approach

This study employs annual panel data for six selected ECOWAS countries covering the period 2000–2024 to examine the asymmetric effects of fiscal policy using the Nonlinear Autoregressive Distributed Lag (NARDL) model. The NARDL approach is appropriate because the variables are integrated of mixed orders, I(0) and I(1), as confirmed by the Levin–Lin–Chu (LLC), Im–Pesaran–Shin (IPS), ADF–Fisher, and PP–Fisher panel unit root tests. Unlike conventional linear Autoregressive Distributed Lag (ARDL) and Error Correction Models (ECMs), the NARDL framework decomposes explanatory variables into their positive and negative partial sums, thereby enabling the estimation of both short-run and long-run asymmetric

effects within a cointegration framework. It also permits the joint testing of long-run equilibrium relationships and asymmetric adjustments, providing a more comprehensive analysis of nonlinear responses to fiscal policy shocks (Ali, Shan, Wang, & Amin, 2018).

The baseline empirical model is specified as follows:

$$Y_{it} = \boldsymbol{\alpha}_{i+}\boldsymbol{\beta}_1 + FP_{it} + \boldsymbol{\beta}_2 FP^{+}_{it} + \boldsymbol{\beta}_3 FP^{-}_{it}\boldsymbol{\beta}_1 X_{it} + \boldsymbol{u}_{it} \quad (1)$$

where:

Y_{it} denotes economic performance for country (i) at time (t); FP_{it} represents the fiscal policy variable; FP^{+}_{it} and FP^{-}_{it} are the nonlinear decomposition fiscal policy term introduced to capture potential nonlinear effects; X_{it} is a vector of control variables; αi denotes the country-specific fixed effect; $\boldsymbol{\beta}_1$, $\boldsymbol{\beta}_2$, and $\boldsymbol{\beta}_3$are the parameters to be estimated, and $\boldsymbol{u}_{it}$ is the stochastic error term

The inclusion of the nonlinear fiscal policy term allows for the possibility of a nonlinear relationship between fiscal policy and economic performance. If the coefficient of the decomposition term$\boldsymbol{\beta}_2$and $\boldsymbol{\beta}_3$ is statistically insignificant, the relationship is considered linear. To investigate fiscal policy asymmetries, economic performance (EPI) is modelled as a function of government expenditure (GEX) and government revenue (GRE). The empirical analysis is conducted using the Pooled Mean Group (PMG) estimator within the Panel Nonlinear Autoregressive Distributed Lag (PNARDL) framework, which allows for heterogeneous short-run dynamics across countries while imposing homogeneity on the long-run coefficients.

Calculating the Raw Economic Performance Index (EPI)

The Economic Performance Index (EPI) is constructed as follows:

100% - [Inflation Rate+ Unemployment Rate +Budget Deficit/GDP-Δ Real GDP]

The index combines four key macroeconomic indicators: inflation, unemployment, the budget deficit-to-GDP ratio, and real GDP growth to provide a composite measure of overall economic performance. Inflation, unemployment, and the budget deficit are treated as undesirable macroeconomic outcomes and therefore reduce the EPI, whereas real GDP growth is regarded as a desirable outcome and increases the index.

Accordingly, a one-percentage-point increase in the inflation rate reduces the EPI by one point, while a one-percentage-point decline in inflation increases the index by the same magnitude. Similarly, a one-percentage-point increase in the unemployment rate lowers the EPI by one point, whereas a corresponding decline raises the index. The budget deficit exhibits the same inverse relationship with the EPI: an increase in the budget deficit-to-GDP ratio reduces the index, while a reduction improves it. In contrast, higher real GDP growth increases the EPI, whereas slower or negative growth lowers the index proportionately.

Overall, higher values of the EPI indicate stronger macroeconomic performance, reflecting lower inflation, lower unemployment, a smaller fiscal deficit, and higher real economic growth.

Data were source from Statbase, Statista and WDI

3.2 Empirical Model

This study employs the Panel Nonlinear Autoregressive Distributed Lag (P-NARDL) framework, estimated via the Pooled Mean Group (PMG) estimator developed by Pesaran, Shin, and Smith (1999). The P-NARDL approach is uniquely advantageous because it permits the decomposition of the independent variables into their positive and negative partial sum processes. This enables the model to capture potential short-run and long-run asymmetric responses in the dependent variable that standard linear models fail to detect.

Following Shin et al. (2014), we establish the baseline, symmetric linear panel model before introducing the asymmetric decompositions:

$$EPIit = \alpha i + \beta 1 GREit + \beta 2 GEX + \mu i_t \quad (2)$$

Where:

EPI represents the Economic Performance Index for country i at time t.
GEX denotes Government Expenditure.
GRE represents Government Revenue
α_I is the intercept and captures country-specific fixed effects
$\mu_{it}$is the idiosyncratic error term

Because positive and negative shocks to fiscal variables may exert different impacts on macroeconomic outcomes, this study adopts the Panel Nonlinear Autoregressive Distributed Lag (P-NARDL) framework developed by Shin et al. (2014). This approach decomposes the fiscal variables into their positive and negative partial sums to capture structural asymmetries.

The long-run asymmetric model is formulated as:

$$EPI_{it} = \alpha_i + \varphi_1 GRE^{+}_{it} + \varphi_2 GRE^{-}_{it} + \varphi_3 GEX^{+}_{it} + \varphi_4 GEX^{-}_{it} + \mu_I \quad (3)$$

$$\Delta EPI_{it} = \emptyset_I \Delta EPI_{it-1} + \{\varphi_{1i}\Delta GRE^{+}_{it-1} + \varphi_{2i}\Delta GRE^{-}_{it-1} + \varphi_{3i}\Delta GEX^{+}_{it-1} + \varphi_{4i} GEX^{-}_{it-1}\} + \Sigma\beta_1\Delta GRE^{+}_{it} + \Sigma\beta_2\Delta GRE^{-}_{it} + \Sigma\beta_3\Delta GEX^{+}_{it} + \Sigma\beta_4\Delta GEX^{-}_{it} + \Omega ECT_{t-1} + \varepsilon_i t \quad (4)$$

where:

$\emptyset$is the speed of adjustment coefficient;

φ denotes long-run coefficients;

4. ESTIMATION RESULTS

Table1: Descriptive Statistics ofEPI

	GAMBIA	GHANA	GUINEA	LIBERIA	NIGERIA	SIERRA
Mean	91.0028	89.0809	90.0815	96.1410	87.8044	91.1594
Median	92.6071	90.0381	92.2166	94.3699	88.39691	90.0083
Maximum	99.5661	109.4512	100.215	214.6448	98.3725	122.9091
Minimum	75.2635	57.0155	70.5023	55.0432	69.0829	59.8302
Std. Dev.	5.8793	13.9759	8.3401	26.7332	6.3289	12.7370

The descriptive statistics in Table 1 reveal that the Economic Performance Index (EPI) varies notably across the selected ECOWAS countries, reflecting differences in fiscal management, institutional quality, macroeconomic stability, and resilience to internal and external shocks.

The Gambia demonstrated a comparatively high and stable economic performance throughout the study period, with a mean EPI of 91.00 and a low standard deviation of 5.88. This minimal dispersion indicates low volatility in economic performance, likely driven by stable fiscal and macroeconomic policies. This finding aligns with North's (1990) institutional theory, which posits that consistent policies and stable institutions are foundational to long-term economic success.

Ghana recorded an average EPI of 89.08, accompanied by a higher standard deviation of 13.98. This larger standard deviation indicates greater historical volatility, despite a relatively strong mean performance. This variability may be attributed to fluctuations in international commodity prices, domestic currency depreciation, fiscal deficits, and external shocks that have periodically disrupted the Ghanaian economy. As noted by Sachs and Warner (2001), shifts in global commodity markets frequently induce substantial macroeconomic volatility in resource-dependent economies.

Guinea's economic performance was moderately stable compared to Ghana and Liberia, yielding a mean EPI of 90.08 and a standard deviation of 8.34. While persistent governance challenges continue to influence overall outcomes, relative stability in public investments and heightened activity in the mining sector may account for this moderate level of variation. This observation supports Rodrik's (2008) argument that effective macroeconomic management and institutional quality are critical drivers of sustained economic performance.

Liberia exhibited both the highest average economic performance (mean = 96.14) and the greatest volatility (standard deviation = 26.73). While the high mean points to episodes of robust economic expansion, the exceptionally high standard deviation, driven by an extreme maximum value of 214.64, underscores severe macroeconomic instability. These swings

reflect Liberia's heightened vulnerability to post-conflict reconstruction bottlenecks, global commodity price shocks, and structural vulnerabilities.

Nigeria registered the lowest average economic performance in the sample, with a mean EPI of 87.80. However, its standard deviation of 6.33 indicates relatively mild variability. This suggests that while Nigeria's economic performance has been constrained by chronic macroeconomic headwinds such as high inflation, currency depreciation, oil price volatility, and fiscal pressures, it has remained tightly bound within a specific range. This outcome conforms to the structuralist perspective of Collier and Venables (2016), who argue that resource-dependent nations often face binding structural constraints that inhibit sustained leaps upward in economic performance.

Sierra Leone's economic performance was generally strong but moderately volatile, characterised by a mean EPI of 91.16 and a standard deviation of 12.74. This volatility highlights the country's susceptibility to primary commodity price fluctuations, public health crises, and the challenges of post-conflict economic recovery. These dynamics mirror the findings of Collier and Hoeffler (2004), who argue that fragile and post-conflict states are inherently more susceptible to external shocks and macroeconomic instability.

The substantial cross-country differences in both central tendency (mean) and dispersion (standard deviation) confirm the presence of significant country-specific heterogeneity. This statistical variation justifies the use of a panel-data methodology. Specifically, it supports the application of the Pooled Mean Group (PMG) estimator, which appropriately accommodates heterogeneous short-run dynamics while enforcing a homogeneous long-run equilibrium relationship across the cross-sections.

4.1 Panel Stationary Tests Results

To ensure the reliability of the data and to produce efficient parameter estimates for robust policy inference, a battery of panel unit root tests was conducted. Analysing the stationarity properties of the variables is a vital diagnostic step to avoid spurious regression results. This study employs four widely utilised first-generation panel unit root tests: the Levin–Lin–Chu (LLC) test (Levin et al., 2002); the Im–Pesaran–Shin (IPS) test (Im et al., 2003); the ADF-Fisher Chi-square test (Maddala & Wu, 1999); and the PP-Fisher Chi-square test, which aggregates individual Phillips–Perron test statistics across the panel members.

Table 3: VAR Lag order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-105.5186	NA	0.0017	2.1278	2.205021	2.1591
1.0	0.2	203.2036*	0.000253*	0.230780*	0.539600*	0.355832*

2	3.945877	6.921303	0.0003	0.334395	0.874830	0.553235
3	6.486904	4.583814	0.0003	0.461041	1.233092	0.773671
4	11.35354	8.492749	0.0003	0.542088	1.545754	0.948506
5	14.19612	4.793378	0.0004	0.662821	1.898102	1.163029

Table 2: Panel Unit Root Tests

	EPI	**GEX**	**GRE**
Levin, Lin & Chu t*	-2.96817**	-2.9719**	-4.39473*
Im, Pesaran, and Shin W-stat	-3.28931*	-2.9426**	-3.3948*
ADF - Fisher Chi-square	33.4698*	34.9573*	43.2769*
PP - Fisher Chi-square	33.5593*	74.9815*	96.0075
Order of integration	1(0)	1(1)	1(1)

*, **, and *** denote statistical significance at the 1%, 5%, and 10% levels, respectively.

The LLC, IPS, ADF-Fisher, and PP-Fisher panel unit root tests consistently demonstrate that the Economic Performance Index (EPI) is stationary at level. This indicates the absence of a unit root, meaning the mean and variance of the EPI series remain constant over time. Consequently, shocks to economic performance are transitory, and the series naturally reverts to its long-run mean without requiring differencing. Conversely, Government Expenditure (GEX) and Government Revenue (GRE) are non-stationary at level but achieve stationarity after their first difference, establishing them as I(1) variables. This reveals that these fiscal variables exhibit stochastic trends, requiring first differencing to yield a stationary process.

The presence of a mixture of I(0) and I(1) variables satisfies the econometric prerequisites for employing the Panel Nonlinear Autoregressive Distributed Lag (P-NARDL) model. As established by Pesaran, Shin, and Smith (1999), the Pooled Mean Group (PMG) estimator is robust and valid when dealing with variables integrated of order zero, order one, or a combination of both, provided that no variable is integrated of order two I(2). Therefore, these unit root results justify the adoption of the P-NARDL PMG estimation technique. These findings align with foundational empirical literature, confirming that datasets exhibiting a mix of I(0) and I(1) behaviours are uniquely suited for the ARDL framework (Pesaran et al., 1999).

4.3 Empirical Results and Discussion

To evaluate the asymmetric long-run and short-run dynamics of fiscal policy on macroeconomic performance, the Panel Nonlinear Autoregressive Distributed Lag (P-NARDL) model was estimated using the Pooled Mean Group (PMG) framework. The empirical results are detailed in Table 3.

Table 3: Pooled Mean Group Asymmetric Regression Results

D.epi		Coefficie	Std error	z	P>|z|	[95%	conf.int]
	drev_neg	-0.18788	0.092372	-2.03	0.042	-0.36892	-0.00683
	drev_pos	-0.17456	0.087346	-2	0.046	-0.34576	-0.00337
	dgex_neg	0.157172	0.092846	1.69	0.09	-0.0248	0.339146
	dgex_pos	0.189145	0.087743	2.16	0.031	0.017173	0.361118
SR							
	ECT	-0.67624	0.047132	-14.35	0	-0.76862	-0.58386
	drev_neg						
	D1.	-0.00044	0.02177	-0.02	0.984	-0.0431	0.042232
	dgex_neg						
	D1.	-0.05472	0.028506	-1.92	0.055	-0.11059	0.001149
	dgex_pos						
	D1.	-0.02004	0.020037	-1	0.317	-0.05931	0.019235
	_cons	2.928908	0.198262	14.77	0	2.540322	3.317494

*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

4.3.1 Discussion of Long-Run Dynamics

The Impact of Government Revenue Shocks

The long-run PMG estimations reveal that the Economic Performance Index (EPI) is negatively and statistically significantly impacted by both positive and negative shocks to government revenue.

A positive shock to government revenue (drev_pos) carries a negative coefficient of −0.1746, statistically significant at the 5% level (p = 0.046). This implies that a 1 percentage point increase in government revenue leads to a 0.175 percentage point decrease in the long-run EPI. This finding aligns with supply-side economic theory, which posits that aggressive or poorly structured taxation deters private investment, dampens household savings, stifles entrepreneurship, and lowers labour participation. Similarly, it underscores the structural tenets of the Laffer Curve (1974): beyond an optimal threshold, escalating tax burdens distort economic choices and contract aggregate output, thereby diminishing overall economic performance.

Conversely, a negative shock to government revenue (drev_neg) also exerts a negative, statistically significant impact on the index (coefficient = −0.1879,p = 0.042). Econometrically, because this variable captures a *decrease* in revenue, its negative coefficient signifies that a drop in revenue leads to a deterioration in economic performance. This outcome supports Keynesian fiscal theory and Musgrave's (1959) functional framework, which argue that shrinking public revenue severely constrains a state's fiscal capacity. It limits the funding of critical public goods—such as infrastructure, healthcare, education, and security—thereby weakening aggregate demand and curbing long-term growth.

Combined, these dual negative findings indicate that the *structural quality* of

revenue mobilisation matters more than its sheer volume. While an expansion of distortionary tax regimes stifles economic agency (Barro, 1990; Tanzi & Zee, 1997), a collapse in revenue collection creates severe fiscal bottlenecks that compromise public investment (Pattillo et al., 2004).

Changes in government spending boost economic performance in ECOWAS, according to the positive coefficients for both DGEX_POS (0.189) and DGEX_NEG (0.157), but expansionary fiscal policy has a greater impact than contractionary policy. This implies that targeted increases in productive public spending, especially on health, education, and infrastructure, are likely to boost economic performance more than comparable spending cuts.The makeup of government spending may be responsible for the greater impact of positive expenditure shocks. Government spending increases increase capital accumulation, boost productivity, encourage private investment, and support sustainable economic growth when they are allocated to capital expenditures, such as energy, transportation infrastructure, healthcare, education, and other productive investments.

On the other hand, the positive coefficient on negative expenditure shocks indicates that fiscal efficiency and macroeconomic performance can be enhanced by cutting back on unproductive recurrent expenditures, such as excessive administrative costs, ineffective subsidies, and non-developmental expenditures. Therefore, the results suggest that public spending's contribution to economic performance is determined by its composition and quality rather than just its total amount.

These findings are in line with Keynesian theory (Keynes, 1936), which holds that economic activity and aggregate demand are stimulated by productive government spending. They also back Barro's (1990) Endogenous Growth Theory, which contends that long-term growth is improved by public investment in productive capital, which increases the productivity of private investment.

The Impact of Government Expenditure Shocks

In contrast to revenue dynamics, long-run changes in government expenditure show a positive relationship with economic performance.

A positive expenditure shock (dgex_pos) is positive and statistically significant at the 5% level (coefficient = 0.1891,p = 0.031). This indicates that a 1 percentage point expansion in public expenditure lifts the long-run EPI by approximately 0.189 percentage points. This offers strong empirical validation for traditional Keynesian theory (Keynes, 1936), wherein targeted expansionary fiscal spending stimulates aggregate demand, crowds in private capital, and expands employment. It suggests that public spending within the sampled ECOWAS nations centres heavily on growth-enhancing fields like infrastructure, energy, and human capital development (Abiad et al., 2016).

Intriguingly, a negative expenditure shock (dgex_neg) also displays a positive coefficient (0.1572), which is statistically significant at the 10% level (p = 0.090). Econometrically, this implies that a contraction in spending is associated with an

improvement in the EPI. This counter-intuitive finding is explained by Public Choice Theory (Buchanan & Tullock, 1962). It indicates that when expenditure cuts focus primarily on wasteful, redundant, or inefficient recurring administrative outlays rather than productive capital investments, fiscal efficiency improves. This trims fiscal deficits, eases public debt pressures, and mitigates the crowding-out effect on the private sector (Afonso & Furceri, 2010; Devarajan et al., 1996).

4.3.2 Short-Run Dynamics and Error Correction Mechanism

The short-run diagnostic results provide critical evidence of a stable, self-correcting long-run equilibrium. The Error Correction Term (ECT) is negative and highly statistically significant (coefficient = −0.6762,p = 0.000). This confirms the existence of a valid long-run cointegrating relationship among the variables. The coefficient value of −0.6762 indicates a rapid speed of adjustment, so that approximately 67.62% of the macroeconomic disequilibrium from short-run shocks is corrected and the economy returns to the long-run equilibrium path within a single period.

4.4 Country-Specific Error Correction Dynamics

While the pooled error correction term establishes a significant group-wide cointegrating vector, the PMG estimator allows the short-run speed of adjustment to vary across cross-sections. This country-specific flexibility captures structural idiosyncrasies, such as distinct institutional designs, differing fiscal frameworks, and unique vulnerabilities to economic shocks.

Table 4: Country-Specific Error Correction and Convergence Profile

Panel	ECT(phi)	Half-Life	Adj.Spd%	Converge	Stars
Ghana	-0.5834	1.19	58.30%	Yes	***
Guinea	-0.5978	1.16	59.80%	Yes	***
Gambia	-0.7448	0.93	74.50%	Yes	***
Liberia	-0.8607	0.81	86.10%	Yes	***
Nigeria	-0.5653	1.23	56.50%	Yes	**
Sierra-Leone	-0.7054	0.98	70.50%	Yes	***

*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively

The country-specific error correction coefficients (ECT(phi) are negative and statistically significant for all six nations, validating the theoretical expectation of long-run convergence following a temporary macroeconomic shock.

Liberia exhibits the highest speed of adjustment (-0.8607, $p < 0.01$), indicating that approximately 86.1% of short-run disequilibrium is eliminated within a single period, translating to a rapid half-life of 0.81 periods. Conversely, **Nigeria** registers the slowest adjustment velocity (ECT(phi) = -

0.5653, p < 0.05), absorbing 56.5% of deviations per period. This comparatively slower adjustment pace suggests structural rigidities within Nigeria's economy—potentially due to its complex oil-revenue distribution mechanics and rigid fiscal commitments—which lengthen the recovery timeline relative to its regional peers.

4.5 Formal Tests for Asymmetry

To verify whether positive and negative changes in fiscal variables exert statistically distinct pressures on economic performance, a series of linear restriction Wald tests were executed.

4.5.1 Long-Run Asymmetry Test

Test Statistic:F(1, 145) = 4.12; Probability Value> F = 0.0443$

The null hypothesis of long-run fiscal symmetry is rejected at the 5% significance level (p < 0.05). This result indicates that structural changes in fiscal aggregates operate nonlinearly over long horizons; positive and negative innovations in revenue and spending produce structurally distinct long-run trajectories for the Economic Performance Index (EPI).

4.5.2 Joint Structural Asymmetry Test

Test Statistic: F(2, 145) = 3.49; Probability Value> F = 0.0332

The joint Wald test rejects the null hypothesis of global model linearity at the 5% significance level. This confirms that modelling fiscal interactions through a conventional linear framework introduces specification bias and fails to capture the intricate, multi-dimensional nature of asymmetric fiscal policy transmissions.

4.5.3 Short-Run Coefficient Equality Test

Test Statistic:F(1, 145) = 0.08; Probability Value> F = 0.7778$

The short-run equality test fails to reject the null hypothesis of symmetry (p > 0.10$). This outcome implies that while long-run structural impacts and adjustment pathways are asymmetric, the immediate, short-run responses to operational fiscal innovations do not exhibit statistically divergent behaviours.

5.0 CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Summary and Conclusion

This study investigated the asymmetric effects of government revenue and expenditure on the Economic Performance Index (EPI) using annual panel data from Anglophone West African countries under the ECOWAS framework. The empirical investigation was motivated by the need to determine whether positive and negative fiscal policy shocks influence macroeconomic performance symmetrically or display structural variations. Methodologically, the study leveraged the Panel Nonlinear Autoregressive Distributed Lag (P-NARDL) model estimated via the Pooled Mean Group (PMG) framework, allowing for short-run cross-sectional heterogeneity while enforcing long-run homogeneity.

The diagnostic process confirmed the suitability of the P-NARDL approach, showing a mixed order of integration where the fiscal aggregates are I(1) and the EPI series is I(0). The model's baseline error correction mechanism demonstrated strong group-wide cointegration, indicating a stable long-run equilibrium path.

Substantively, the empirical results show that both positive and negative innovations in government revenue have a long-run negative impact on economic performance. This underscores a critical dual vulnerability: expanding revenue through distortionary taxation stifles private enterprise, while revenue shortfalls severely restrict structural fiscal capacity.

Conversely, government expenditure shocks yield a positive relationship with the index. Positive expenditure innovations significantly boost the EPI, supporting Keynesian growth dynamics, while negative expenditure variations similarly enhance economic performance by pointing to the optimisation of public funds via the removal of unproductive, recurrent outlays. Taken together, this study concludes that the transmission of fiscal policy to economic performance is inherently asymmetric and depends heavily on the structural quality of revenue mobilisation and the operational efficiency of public spending.

5.2 Policy Recommendations

Based on the above findings, the following policy interventions are recommended for the governments of the selected ECOWAS countries:

i. **Optimise the Revenue Mix:** Shift fiscal strategy away from raising distortionary tax rates on capital and labour. Governments should prioritise broadening the tax base, closing structural loopholes, and formalising shadow economic sectors to protect revenue streams without dampening private investment.

ii. **Modernise Tax Administration:** Invest in digital tax administration infrastructures to mitigate tax evasion, reduce compliance costs, and stabilise revenue collection, shielding the state from sudden, destabilising revenue shortfalls.

iii. **Enhance Expenditure Efficiency:** Restructure public spending portfolios by aggressively cutting non-productive, wasteful recurrent administrative costs. This ensures that essential fiscal resources are preserved for high-multiplier capital investments in infrastructure, energy, health, and education.

iv. **Strengthen Fiscal Frameworks:** Establish robust fiscal rules and institutional mechanisms, such as counter-cyclical sovereign wealth funds, to absorb external commodity price shocks and maintain structural investment continuity during downturns.

v. **Reinforce Governance and Accountability:** Elevate standards of fiscal transparency and auditing to reduce institutional leakage, ensuring that public outlays are translated cleanly into productive economic outcomes.

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