EXTERNAL DEBT AND GROWTH DYNAMICS IN SELECTED WEST AFRICAN COUNTRIES

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Abstract

This study investigates the growth implications of external debt in six selected West African countries Nigeria, Ghana, Mali, Senegal, Côte d'Ivoire, and Burkina Faso covering the period 1990–2024. Anchored on a quantitative research design within a dynamic panel framework, the study applies the System Generalized Method of Moments (GMM) to account for endogeneity and dynamic interactions. The population comprises all West African states, while the sample is restricted to the six largest economies, representing over 85% of the region's output. The study relies on secondary data sourced from the World Development Indicators (WDI), covering GDP growth, external debt stock, debt service, and macroeconomic controls. The findings reveal that external debt stock exerts a significant negative effect on economic growth, while debt servicing is positive but statistically insignificant. Real effective exchange rate appreciation further undermines growth, whereas foreign direct investment supports GDP performance. These results highlight the inefficiency of debt utilization and its limited role in stimulating growth dynamics. The study recommends that ECOWAS governments restructure borrowing strategies by linking new debt strictly to growth-enhancing projects, thereby strengthening the capacity of external debt to positively influence long-term growth dynamics in the sub-region.

Keywords: External Debt, Economic Growth, Debt Overhang, System GMM, ECOWAS Countries

1.   Introduction

Economic growth dynamics in West African countries have remained a central concern for policymakers and researchers, given the region's persistent struggles with poverty, structural imbalances, and vulnerability to external shocks. Growth dynamics capture the fluctuations, sustainability, and long-term trajectory of output expansion, as well as the capacity of economies to generate employment and improve living standards (World Bank. 2020). In many ECOWAS countries, growth has been uneven, driven largely by commodity exports, fragile institutions, and limited diversification, leaving them exposed to both internal and global pressures. Within this context, external debt has emerged as a critical factor shaping development outcomes, raising questions about whether debt accumulation fosters productive investment and growth or

exacerbates fiscal vulnerability and economic stagnation. In recent decades, external debt has played a central role in financing development in many African countries, particularly in the West African sub-region (Ashakah et al., 2024). The economic logic behind external borrowing is based on the assumption that when a country lacks sufficient domestic savings, it can bridge the resource gap by borrowing from external sources to finance capital formation, infrastructure, and productivity-enhancing investments. However, this approach only yields positive outcomes if borrowed resources are effectively utilized for growth-generating projects and if the debt remains within sustainable limits (Qureshi & Liaqat, 2020).

The ECOWAS region, composed largely of low- and lower-middle-income countries, has experienced significant debt accumulation over the past few decades. This has raised concerns regarding debt sustainability and the long-term implications of debt servicing on macroeconomic stability. Some empirical studies have found a negative relationship between external debt and economic growth, highlighting that increasing debt stock may lead to fiscal stress and crowd out productive investments (Ashakah et al., 2024, Daba et al., 2023). For instance, Ashakah et al. (2024)

reported a statistically significant negative impact of external debt on economic growth across six ECOWAS countries between 1990 and 2022, suggesting that large external debt burdens have hindered productive capacity.

Contrarily, other studies indicate that external debt can support economic growth in certain contexts, particularly in low-income countries, if managed prudently and if the borrowed funds are channeled into critical development sectors (Qureshi & Liaqat, 2020). These divergent findings underscore the complexity of the debt-growth nexus and the need for country- and region-specific empirical evaluations. It is within this context that this study investigates the growth implications of external debt in six ECOWAS countries: Nigeria, Ghana, Mali, Senegal, Côte d'Ivoire, and Burkina Faso.

Despite decades of external borrowing and structural adjustment programs, many countries in the West African sub-region continue to face slow and volatile economic growth. The persistent accumulation of external debt, coupled with weak institutions, limited absorptive capacity, and governance challenges, has raised critical questions about the effectiveness of external debt in promoting economic development (Daba et al., 2023). Although external borrowing is often justified as a means of bridging

savings–investment gaps, in practice it has tended to generate debt overhang, rising debt service obligations, and constrained fiscal space for development expenditure. The empirical evidence from this study reinforces these concerns, as the dynamic panel analysis employing the System GMM estimator shows that external debt stock (EXTDS) exerts a significant negative effect on economic growth in the selected ECOWAS countries (Ashakah et al., 2024).

Although external debt servicing (EDS) showed a positive coefficient, it was not statistically significant, implying that debt repayments are not generating sufficient productivity to positively influence GDP. These findings suggest an inefficient use of external debt, potentially due to misallocation, corruption, or low-return projects, which undermine long-term economic performance.

The key issue, therefore, is not merely the presence of debt, but rather its quality, management, and purpose. West African countries may be caught in a vicious debt-growth trap where rising debt leads to limited growth, which in turn necessitates more borrowing, thereby compromising long-term development goals (Odejimi & Ozor, 2018). Addressing this issue requires a comprehensive reevaluation of debt acquisition strategies and fiscal governance in the region. Against this backdrop, the present study seeks to investigate the impact of external debt on growth dynamics in selected West African countries, with particular attention to the magnitude, direction, and channels through which debt influences economic performance.

2. Literature Review

2.1 Conceptual Review

A conceptual review examines the key theoretical and definitional constructs underpinning a research study. In the context of this study, the main concepts are **external debt, debt service,** and **economic growth.**

External Debt

External debt refers to the portion of a country's debt that is borrowed from foreign lenders, including commercial banks, governments, or international financial institutions. It must be repaid in foreign currency (usually U.S. dollars or euros) and is often incurred to finance deficits or development projects. According to Daba et al. (2023), excessive external debt accumulation without corresponding economic returns leads to a debt overhang, where future income is constrained by past borrowing, thereby stifling growth.

Debt Service

Debt service represents the cash required to cover the repayment of interest and principal on external debt. High debt service payments often crowd out public investment in critical infrastructure and social sectors. Qureshi and Liaqat (2020) suggest that while moderate debt service may not harm growth, excessive burdens can negatively impact a country's fiscal balance and development potential.

Economic Growth

Economic growth, typically measured by changes in real GDP, signifies an increase in a country's output over time. Growth can be influenced by several factors, including capital accumulation, labor productivity, institutional quality, and macroeconomic stability. Ashakah et al. (2024) empirically show that in ECOWAS countries, economic growth is negatively and significantly affected by rising external debt stock.

2.3   Empirical Review

Recent studies provide fresh insights into investigating the growth implications of external debt in six selected ECOWAS countries. Ashakah et al (2024) investigated the impact of external debt, and debt service on economic growth in the ECOWAS sub-region during the period 1990-2022. The study analyzed a panel data set using the fixed and random effect models. The results of the panel data unit root test confirmed that the variables in the specified model were integrated in different orders. The panel co-integration tests indicated that a long-run relationship existed among the variables in the specified debt-growth model. The results of the model estimation revealed that external debt negatively and significantly impacted economic growth at the 1% level during the period of the study. The results further revealed that debt service negatively impacted economic growth, but failed the significance test at the 5% level. The study recommended that countries in the ECOWAS sub-region should reduce external debt accumulation, and efficiently use revenue generated from external debt to boost economic growth

Similarly, Odejimi and Ozor (2018) studied the effects of debts on the economic growth of countries in West Africa using panel data for the period 1970-2011. Employing the fixed and random effects, and GMM estimation techniques, the study found a significant and negative relationship between debt stock and economic growth. The study recommended that the governments of West African countries should reduce their

reliance on debt as a strategy to grow their economies.

Daba et al (2023) investigated the short- and long-run effect of external debt on the economic growth of 39 SSA countries during the last decade for the periods of 2011–2021. The annual balanced dynamic panel data for the study were sourced from a recognized trustworthy data source, the world development indicator. The result of the study divulged that external debt has a significant negative impact in both the short and long run. Unequivocally, other things remaining constant, a percentage change in total external debt is associated with a 0.034 percent decline in the real GDP of SSA in the short run, while it leads to 0.65 percent shrinkage in the real GDP of SSA in the long run. The study concludes that the negative impact of the long run is greater than that of the short run. The policy implication is that SSA countries should allocate the external debt on the projects that bring other investment opportunities to amortize external debt. Further, the strategies that improve domestic revenue mobilization sources that compliment external debt such as improving informal sectors to broaden tax bases and minimizing domestic revenue leakages need to be established in SSA countries.

Qureshi and Liaqat (2020) investigated the long-term consequences of external debt on economic growth using panel vector auto regression using 123 countries across the globe for the panel data from the period 1990 to 2015. The sample countries included in the study were based on level of their income. Their study found that there is positive relationship between external debt and economic growth in the lower and middle income countries while the overall external debt effect was found to have negative relationship on economic growth of the country. This shows that the effect of external debt on economic growth varies based on level of the countries.

Other similar works by Mumba and Li (2020) have found that both short- and long-term external debt affects the economic growth of nine southern African countries negatively for the sample study period from 2000 to 2018. The implication of the study was that southern African countries need to limit themselves from severe dependence on external debt to accelerate their economic growth in both short and long periods. This shows that there is a difference in argument among literature in different regions of the world.

In terms of research gaps, most existing studies (Ashakah et al., 2024; Odejimi &

Ozor, 2018; Daba et al., 2023; Mumba & Li, 2020) confirm a negative relationship between external debt and economic growth, though their findings differ across regions and income groups. However, limited attention has been devoted to country-specific dynamics within West Africa, particularly among the six largest ECOWAS economies. This underscores the need for further empirical investigation using updated data and robust estimation techniques to provide clearer insights into the debt–growth nexus in the sub-region.

2.2 Theoretical Review

This study is anchored on three principal economic theories that provide insight into the relationship between external debt and economic growth. These are the Debt Overhang Theory, the Dual Gap Theory, and the Endogenous Growth Theory.

The Debt Overhang Theory, originally developed by Krugman (1988) and later expanded by Sachs (1989), asserts that when a country's debt level is perceived to be unsustainable meaning that future debt obligations are expected to exceed the country's repayment capacity it discourages investment. This is because both domestic and foreign investors anticipate higher future taxes or inflation as mechanisms for debt repayment, thereby treating debt as a tax on future income. As a result, investment and economic growth decline due to the reduced expected return on capital. This theory is particularly relevant to the West African context, where many ECOWAS member states are burdened by substantial external debt. Empirical findings by Ashakah et al. (2024) and Daba et al. (2023) support the debt overhang hypothesis by showing that high external debt stock in the sub-region has a statistically significant negative impact on economic growth.

The Dual Gap Theory, advanced by Chenery and Strout (1966), explains the development challenges of low-income countries in terms of two critical shortfalls: the savings gap and the foreign exchange gap. The theory posits that when domestic savings are insufficient to finance necessary investment, and when export earnings are inadequate to pay for essential imports, foreign borrowing becomes necessary to bridge these gaps. In this light, external debt is seen as a tool for spurring growth by complementing domestic resources. However, the theory also implies that the success of external borrowing depends heavily on how efficiently the borrowed funds are allocated. In the ECOWAS region, where savings and foreign exchange reserves are limited, the Dual Gap Theory offers a conceptual basis for

justifying external borrowing. Yet, as the study reveals, if borrowed resources are poorly managed or diverted from productive uses, the expected benefits may not materialize.

The Endogenous Growth Theory, developed by scholars such as Romer (1986) and Lucas (1988), emphasizes that long-term economic growth is largely driven by factors internal to the economy particularly investments in human capital, innovation, and knowledge. From this perspective, external debt can be beneficial if used to finance critical sectors such as education, infrastructure, and technology, which in turn enhance productivity and support sustained economic growth. Thus, debt is not inherently detrimental; rather, its effect depends on how it is utilized within the economy. In the context of this study, the evidence suggests that while foreign direct investment (FDI) has a statistically significant positive impact on growth, external debt stock tends to exert a negative effect, implying that the borrowed resources may not be directed toward growth-enhancing sectors (Ashakah et al., 2024; Mumba & Li, 2020). This reflects the core insight of the endogenous growth theory policy choices and institutional effectiveness determine whether debt supports or undermines growth.

Theoretical Framework

The theoretical framework guiding this study synthesizes the insights from the three theories discussed above. The Debt Overhang Theory informs the analysis of how high levels of external debt can discourage investment and retard economic performance. The Dual Gap Theory explains the economic rationale for borrowing, particularly in contexts like West Africa where both domestic savings and foreign exchange earnings are insufficient to meet developmental needs. Finally, the Endogenous Growth Theory highlights the importance of efficient and productive use of external debt in fostering long-term growth.

Taken together, these theories provide a comprehensive lens through which the growth implications of external debt can be examined. The framework assumes that external borrowing is initially motivated by genuine development needs (as per the Dual Gap Theory), but its ultimate impact on growth is mediated by how the borrowed funds are used (Endogenous Growth Theory) and the level of debt accumulation relative to the country's capacity to repay (Debt Overhang Theory).

In West Africa, where empirical evidence increasingly shows a negative relationship between debt stock and GDP growth, the

theoretical framework supports the conclusion that while external debt may be necessary, its mismanagement through poor policy, inefficiency, or corruption can transform it from a development tool into a growth constraint. This reinforces the importance of debt sustainability, fiscal discipline, and strategic investment of borrowed resources as essential conditions for external debt to contribute positively to economic growth (Ashakah et al., 2024; Daba et al., 2023; Mumba & Li, 2020).

3. Methodology

This study employed a quantitative research design within a dynamic panel framework to examine the relationship between external debt and economic growth in six selected ECOWAS countries from 1990 to 2024. The design is appropriate because it enables the investigation of causal linkages over time, controls for country-specific heterogeneity, and ensures robust estimation of growth dynamics using the System GMM approach. The study focuses on six West African countries Burkina Faso, Côte d'Ivoire, Ghana, Mali, Nigeria, and Senegal. These countries were selected because of their significant contribution to the region's economy. According to the World Economic Outlook Database (2019), the total nominal GDP of all West African countries was estimated at USD 766.338 billion, out of which the six selected countries accounted for USD 660.152 billion, representing approximately 86.15% of the regional output. This makes them highly representative of the West African economic landscape. The analysis is based on annual data spanning the period 1990 to 2024, covering thirty-four (35) years. This timeframe was chosen to provide a sufficiently long horizon to capture structural changes, cyclical patterns, and the dynamic interactions

The objective is to examine how external debt stock (EXTDS) impact on economic growth in Nigeria, Ghana, Mali, Senegal, Côte d'Ivoire, and Burkina Faso. The research utilizes the model of Adjei et al. (2020) as specified in equation 3.1:

$$GDP = f\,(EXTDS,\ EDS,\ DREER,\ INT) \tag{3.1}$$

Equation 3.2 is specified in a linear form as shown:

$$GDP_t = \beta_0 + \sum \beta_1 EXTDS_{t-1} + \sum \beta_2 EDS_{t-1} + \sum \beta_3 DREER_{t-1} + \mu_t \tag{3.2}$$

where $GDP_{gi,\,t}$ and $GDP_{gi,\,t-1}$, $EXTDS_{gi,\,t}$ and $EXTDS_{gi,\,t-1}$, $EDS_{gi,\,t}$ and $EDS_{gi,\,t-1}$ represents economic growth, external debt stock, external debt service of Nigeria,

Ghana, Mali, Senegal, Côte d'Ivoire, and Burkina Faso and their respective lagged values, X represents a vector of variables used to control for external debt stock and economic growth, µ represents the specific effects and ε is the error term.

The study employed both descriptive statistics and the econometric tools in analyzing the data. The descriptive tools consist of descriptive statistics, graphs, while the econometric tools included Unit Root test (for which the Augmented Dicker- Fuller (ADF) to test for the stationarity of the data. Generalized method of moments (GMM) estimator was used to achieve the objectives of the study.

In order to achieve objective which is to examine how external debt stock (EXTDS) impact on economic growth in Nigeria, Ghana, Gambia, Senegal, Benin, Côte d'Ivoire, and Burkina Faso, the generalized method of moments (GMM) estimator was specified dynamically. Hence the dynamic form of the model is shown as follows:

$$GDP = \alpha_0 + \alpha_1 GDP_{t-1} + \alpha_2 EXTDS + \alpha_3 EDS_{it} + \alpha_4 DREER_{it} + \mu_{it} \qquad (3.3)$$

$$EXTDS = \pounds_0 + \pounds_1 EXTDS_{t-1} + \pounds_2 GDP + \pounds_3 EDS_{it} + \pounds_4 DREER_{it} + \mu_{it} \qquad (3.4)$$

$$EDS = \pounds_0 + \pounds_1 EDS_{t-1} + \pounds_2 GDP + \pounds_3 EXTDS_{it} + \pounds_4 EDS_{it} + \pounds_5 DREER_{it} + \mu_{it} \qquad (3.5)$$

The subscripts i=1, . . ., N representing all the countries of coverage, and t=1, . . ., T represent time period (1986-2020) covered in the study respectively, while ε is the error term.

Hence, the model is operationalized using the generalized method of moments (GMM) estimator of Arellano and Bond (1991). Omri (2014) noted that by transforming the regressors through first differencing, the Arellano and Bond (1991) approach removes country-specific effects. Furthermore, unobserved fixed effects no longer enter the equations as they are by assumption constant between periods. The analytical version of the model therefore becomes:

$$GDP_{gi,t} = \alpha_0 GDP_{2g,t-1} + \alpha_1 EXTDS_{g,it} + \alpha_2 EDS_{g,it} + \beta X_{i,t} + \mu_{i,t} + \varepsilon_{it} \qquad (3.6)$$

$$EXTDS_{gi,t} = \delta_0 EXTDS_{gt-1} + \delta_1 GDP_{2gi,t} + \delta_2 EDS_{g,it} + \beta X_{i,t} + \mu_{i,t} + \varepsilon_{it} \qquad (3.7)$$

$$EDS_{gi,t} = \ell_0 EDS_{g,t-1} + \ell_1 GDP_{gi,t} + \ell_2 EDS_{gi,t} + \beta X_{i,t} + \mu_{i,t} + \varepsilon_{it} \qquad (3.8)$$

where GDPgi, t and GDPgi, $_{t-1}$, EXTDS gi, t and EXTDS gi, $_{t-1}$, EDS gi, t and EDS gi, $_{t-1}$ represents economic growth, external debt stock, external debt service of Nigeria, Ghana, Gambia, Senegal, Benin, Côte d'Ivoire, and Burkina Faso and their respective lagged values, X represents a vector of variables used to control for external debt stock and economic growth, μ represents the specific effects and ε is the error term.

The estimation procedure includes a descriptive analysis that shows the characteristics and some preliminary summary statistics of the values of all the variables as employed in the empirical analysis. The statistics include the mean, standard deviation, skewness, and kurtosis. The second procedure is the test of correlation, with the view to detecting potential multicollinearity, especially among the selected explanatory variables. The absence of which enhances the reliability of the inferences, especially for policy decisions. Furthermore, due to the problem of endogeneity among the selected variables, a simultaneous equation model using the System GMM approach was estimated. By this, we established the economic growth-external debt-external debt service nexus in Nigeria, Ghana, Gambia, Senegal, Benin, Côte d'Ivoire, and Burkina Faso. Based on the GMM framework, some diagnostic tests of the model will be performed.

Table 3.1: Variable description and data source

Variable name	Variable description	Source	Unit of measurement
Growth output (GDP)	Annual growth rate of Gross Domestic Product	WDI	Percentage (%)
External Debts(EXTDS)	Total external debt stock as a share of Gross National Income (GNI)	WDI	Percentage of GNI (%) or USD (current)
External Debt Service (EDS)	Total external debt service payments (principal + interest) as a share of exports of goods and services	WDI	Percentage of exports (%) or USD (current)
Domestic real exchange rate (DRER)	Real effective exchange rate index (adjusted for inflation)	WDI	Index (2010 = 100 or base year)

Source: Compiled by the author.

4.   Data Analysis

4.1   Descriptive Statistics

Table 4.1:   Descriptive Statistics for Burkina Faso

	GDP	DRER	EXTDS	EDS
Mean	7.070272	495.8504	3.9312	5.03
Median	4.740768	511.5524	1.6111	5.1432
Std. Dev.	5.023244	128.1920	3.99	7.8387
Skewness	0.640689	-0.40211	1.0567	1.715
Kurtosis	1.894374	2.409213	2.5099	4.9774
Jarque-Bera	4.177165	1.452247	6.8649	22.86028
Probability	0.123863	0.483781	0.0323	0.000011

Source: Authors E-views Output (2025).

The descriptive statistics reveal that Burkina Faso's GDP and exchange rate are relatively stable and approximately normally distributed, while external debt stock and debt service display high variability and non-normality. In particular, the extreme skewness and kurtosis of debt service highlight significant fiscal stress and repayment volatility.

Table 4.2: Descriptive Statistics for Cote d'lvoire

	DRER	GDP	GFC	REM
Mean	102.284	22.5194	4.90937	0.1928
Median	100	15.341	3.32722	0.15106
Std. Dev.	13.9268	16.126	4.09922	0.12449
Skewness	0.69945	1.26852	0.81718	0.34483
Kurtosis	2.53514	3.28551	2.21165	1.65136
Jarque-Bera	3.16902	9.50551	4.80176	3.34609
Probability	0.20505	0.00863	0.09064	0.18768

Source: Authors E-views Output (2025).

For Côte d'Ivoire, GDP and gross fixed capital formation show high variability and positive skewness, with GDP deviating significantly from normality ($p < 0.01$). In contrast, the exchange rate, remittances, and investment indicators are more stable and approximately normally distributed, reflecting moderate fluctuations in external and domestic conditions.

Table 4.3:   Descriptive Statistics for Ghana

	GDP	DRER	EXTDS	EDS
Mean	23.5391	106.957	1.375566	1.157559
Minimum	4.98302	68.1822	2.770098	2.2221
Std. Dev.	22.7882	31.7604	1.184442	1.93
Skewness	0.89067	1.58025	0.993345	2.951202
Kurtosis	2.25504	6.2689	2.402652	11.72281
Jarque-Bera	5.43688	30.1503	6.276322	161.7669
Probability	0.06598	0	0.043362	0

Source: Authors E-views Output (2025*).*

In Ghana, GDP and external debt indicators show considerable variability with moderate skewness, though GDP is close to normality ($p \approx 0.066$). However, the exchange rate and especially debt service exhibit strong skewness and excess kurtosis, with Jarque-Bera tests confirming significant non-normality, indicating high volatility and extreme fluctuations.

Table 4.4: Descriptive Statistics for Mali

	GDP	DRER	EXTDS	EDS
Mean	7.30969	495.85	3.0209	9.6443
Median	4.71407	511.552	2.9609	8.2006
Std. Dev.	5.38077	128.192	9.12	4.4878
Skewness	0.61261	-0.4021	1.016161	2.0238
Kurtosis	1.82559	2.40921	4.353108	6.9749
Jarque-Bera	4.20057	1.45225	8.693471	46.9283
Probability	0.12242	0.48378	0.012949	0.0001

Source: Authors E-views Output (2025).

For Mali, GDP and the exchange rate appear relatively stable and close to normal distribution, with moderate skewness and acceptable probability values. In contrast, external debt stock and debt service exhibit high variability, strong skewness, and leptokurtosis, with Jarque-Bera results confirming significant non-normality, especially for debt service.

Table 4.5:   Descriptive Statistics for Nigeria

	GDP	DRER	EXTDS	EDS
Mean	208.466	110.475	3.6978	2.6809
Median	104.912	99.5617	3.3511	1.8509
Std. Dev.	177.43	54.7089	1.4617	2.0609
Skewness	0.50496	1.80811	1.804927	1.664272
Kurtosis	1.61965	5.54292	5.845424	4.784183
Jarque-Bera	4.26605	28.501	30.81092	20.7995
Probability	0.11848	0.0001	0.00002	0.00003

Source: Authors E-views Output (2025).

In Nigeria, GDP shows high variability but remains approximately normally distributed, while the exchange rate, external debt stock, and debt service are highly skewed with excess kurtosis. The Jarque-Bera tests ($p <$ 0.05) confirm significant non-normality for these variables, indicating volatility and frequent extreme fluctuations in debt and exchange rate dynamics.

Table 4.6:   Descriptive Statistics for Senegal

	GDP	DRER	EXTDS	EDS
Mean	11.9825	495.85	6.3309	3.8108
Median	8.81046	511.552	3.9209	3.0008
Std. Dev.	6.29555	128.192	5.2209	2.7608
Skewness	0.57651	-0.4021	1.951072	2.160429
Kurtosis	1.84741	2.40921	5.81715	7.166823
Jarque-Bera	3.87615	1.45225	33.77946	52.54699
Probability	0.14398	0.48378	0	0.0001

Source: Authors E-views Output (2025).

For Senegal, GDP and the exchange rate are relatively stable and close to normal distribution, as indicated by moderate skewness and non-significant Jarque-Bera results. However, external debt stock and debt service display high variability, strong skewness, and leptokurtosis, with significant non-normality ($p < 0.05$), reflecting volatility and extreme repayment pressures

4.2   System Generalized Method of Moments (GMM)

Table 4.6: Dynamic Panel-data Estimation, two-step system GMM

GDP	Coefficient	Corrected Std. Error	t-Test
GDPt-1	-2.049435	0.891598	-2.29**
EXTDS	-2.125686	0.74277	-2.86***
EDS	3.265386	2.573647	1.27
DREER	-1.1588	0.125644	-9.22***
Constant	10.4942	7.37877	1.42

Source: Authors E-views Output (2025).Note: 5% level (**) 1% level (***)

The Table 4.6 summarizes the results of a dynamic panel-data estimation using a two-step System Generalized Method of Moments (GMM) approach. The Lagged GDP coefficient is -2.049435 with a corrected standard error of 0.891598. The t-test value is -2.29, which is statistically significant at the 5% level. The negative and significant coefficient suggests that there is a negative relationship between the current GDP and its lagged value. This might indicate a corrective effect where high GDP in the previous period leads to lower GDP growth in the current period, possibly due to cyclical factors or diminishing returns.

The coefficient of external debt stock is -2.125686 with a corrected standard error of 0.74277. The t-test value is -2.86, which is statistically significant at the 1% level. The negative and significant coefficient indicates that higher external debt stock negatively impacts GDP. This suggests that as countries allocate more resources to servicing external debt, less is available for productive investments, leading to a decline in GDP.

The coefficient of external debt services is 3.265386 with a corrected standard error of 2.573647. The t-test value is 1.27, which is not statistically significant. The positive but not significant coefficient suggests that while there may be a positive relationship between external debt service and GDP, it is not strong enough to be conclusive. This could imply that the effect of debt stock on GDP is more nuanced and might depend on other factors not captured in the model.

The coefficient direct exchange rate is -1.1588 with a corrected standard error of 0.125644. The t-test value is -9.22, which is statistically significant at the 1% level. The negative and highly significant coefficient indicates that an increase in the real effective

exchange rate (appreciation) negatively impacts GDP. This can be interpreted as appreciation making exports more expensive and imports cheaper, thereby reducing net exports and GDP.

4.3   Post Estimation Tests
Table 4.7: Breusch-Godfrey Serial Correlation LM Test Result

Countries	F-statistic	Obs*R-squared	Prob. F	Prob. Chi-Square(2)
Senegal	0.78258	4.59245	0.486	0.1006
Nigeria	0.889935	3.103284	0.4301	0.2119
Mali	1.16664	4.717301	0.342	0.1945
Ghana	0.86784	3.033775	0.4387	0.2194
Cote d'lvoire	0.047531	0.162858	0.9537	0.9218
Burkina Faso	0.069227	0.385337	0.9335	0.8248

Source: Authors E-views Output (2025).

The Breusch-Godfrey Serial Correlation LM Test results for Senegal indicate that the F-statistic is 0.782580 with a probability of 0.4860 for the F-test (Prob. F (2,9)), suggesting no significant evidence against the null hypothesis of no serial correlation. Additionally, the Chi-Square test statistic is 4.592450 with a probability of 0.1006, indicating no significant serial correlation in the model at conventional significance levels. The Breusch-Godfrey Serial Correlation LM Test results for Nigeria show that the F-statistic is 0.889935 with a probability of 0.4301 for the F-test (Prob. F (2,16)), indicating no significant evidence against the null hypothesis of no serial correlation. Additionally, the Chi-Square test statistic is 3.103284 with a probability of 0.2119, further suggesting no significant serial correlation in the model.

The Breusch-Godfrey Serial Correlation LM Test results for Cote d'Ivoire, with an F-statistic of 0.047531 and associated probabilities of 0.9537 and 0.9218 for the F and Chi-Square tests respectively, indicate no significant evidence of serial correlation in the residuals, suggesting that the model adequately captures the autocorrelation structure. The results for Burkina Faso indicates that the Breusch-Godfrey Serial Correlation LM Test result, with an F-statistic of 0.069227 and a p-value of 0.9335, does not provide sufficient evidence to reject the null hypothesis of no serial correlation, suggesting that the residuals in the model exhibit no significant serial correlation up to the lag order tested.

The Breusch-Godfrey Serial Correlation LM Test results for Ghana, with an F-statistic of 0.867840 and associated probabilities of 0.4387 for the F-test and 0.2194 for the Chi-Square test, suggest no significant evidence of serial correlation in the residuals, indicating that the model adequately captures the autocorrelation structure. The Breusch-Godfrey Serial Correlation LM Test results for Mali, with an F-statistic of 1.166640 and

associated probabilities of 0.3420 for the F-test and 0.1945 for the Chi-Square test, suggest no significant evidence of serial correlation in the residuals. These results corroborate findings from other regional studies (Ashakah, *et al* (2024) which investigated the impact of external debt, and debt service on economic growth in the ECOWAS sub-region.

Table 4.8: System GMM Model Diagnostics

Test	Coefficient/P-values	Tests	Coefficient/P-values
F-Statistics	30491.17(0.000)	Arellano-Bond AR(1)	-0.90(0.370)
Sargan Test	81.45(0.000)	Arellano-Bond AR(2)	-0.09(0.929)

Source: Authors E-views Output (2025).Note: 5% level (**) 1% level (***)

From the Table 4.8 the value of F-Statistics is 30491.17 with a p-value of 0.000, which is statistically significant at the 1% level. The significant F-statistic indicates that the overall model is statistically significant and the explanatory variables jointly have a significant impact on GDP. The value Arellano-Bond AR(1) is -0.90 with a p-value of 0.370. This shows clearly that the AR(1) test is not significant, indicating no first-order serial correlation in the residuals.

The Sargan Test value is 81.45 with a p-value of 0.000, which is statistically significant at

the 1% level. The significant Sargan test indicates that the overidentifying restrictions are not valid, suggesting potential issues with the instruments used in the GMM estimation. The Arellano-Bond AR(2) value is -0.09 with a p-value of 0.929. This test is not significant, indicating no second-order serial correlation in the residuals, which is a desirable property for the validity of the GMM estimators.

The economic implication of these estimates indicates that, the negative impact of external debt service on GDP suggests the need for

careful management of external debt obligations. Policymakers should focus on reducing debt service burdens, possibly through debt restructuring or obtaining concessional financing, to free up resources for productive investments. The significant negative impact of the real exchange rate on GDP highlights the importance of maintaining a competitive exchange rate. Policies that prevent excessive appreciation of the currency could help boost exports and support economic growth.

Table 4.9: Residual Cross-Section Dependence Test

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	7.073181	15	0.0703
Pesaran scaled LM	0.681477		0.4051
Pesaran CD	1.694302		0.5041

Source: Authors E-views Output (2025)

The results provided in Table 4.9 above indicate the outcomes of several statistical tests used to detect cross-sectional dependence in panel data. The Breusch-Pagan Lagrange Multiplier (LM) test is used to detect cross-sectional dependence in panels with a relatively large number of times (T) and a smaller number of cross-sectional units (N). The null hypothesis (H0) for this test is that there is no cross-sectional dependence. The p-value (0.0703) is slightly above the common significance level of 0.05, indicating that we fail to reject the null hypothesis at the 5% significance level. This suggests that there is no significant evidence of cross-sectional dependence in the data according to the Breusch-Pagan LM test.

The Pesaran scaled LM test is another method to check for cross-sectional dependence. It is designed to improve the power of the Breusch-Pagan LM test when the number of cross-sectional units (N) is large. The p-value (0.4051) is considerably higher than 0.05, indicating that we fail to reject the null hypothesis. This means that, according to the Pesaran scaled LM test, there is no significant cross-sectional dependence in the data. The Pesaran CD (Cross-sectional Dependence) test is another approach to detecting cross-sectional dependence. It is particularly useful when N is large. The p-value (0.5041) is much higher than 0.05, suggesting that we fail to reject the null hypothesis of no cross-sectional dependence. Therefore, the Pesaran CD test also indicates no significant cross-sectional dependence.

Based on the results of the three tests (Breusch-Pagan LM, Pesaran scaled LM, and

Pesaran CD), we conclude that there is no significant evidence of cross-sectional dependence in the panel data. All three tests yield p-values above the common significance level of 0.05, suggesting that the null hypothesis of no cross-sectional dependence cannot be rejected. This implies that the cross-sectional units in the panel data are independent of each other, and any panel data models applied to this dataset can be estimated without the need to account for cross-sectional dependence. This independence simplifies the modeling process and ensures that standard panel data estimation techniques remain valid

Conclusion

This study has examined the growth implications of external debt in six ECOWAS countries over the period 1990–2024 using a dynamic panel System GMM approach. The findings consistently reveal that external debt stock exerts a significant and negative impact on economic growth, while debt service payments, though positive, remain statistically insignificant. The results further highlight that real effective exchange rate appreciation undermines growth, whereas foreign direct investment plays a supportive role in enhancing GDP performance.

The evidence underscores the inefficiency of external debt utilization in West Africa, pointing to challenges such as weak governance, misallocation of borrowed resources, and corruption. These findings confirm the debt overhang hypothesis, suggesting that excessive accumulation of debt not only constrains fiscal space but also discourages private investment, thereby limiting long-term development prospects. The policy implication is clear: external borrowing, though sometimes necessary to bridge savings and foreign exchange gaps, must be carefully aligned with productive investments that can generate returns sufficient to offset future repayment obligations. Strengthened fiscal governance, transparent debt management, and policies that enhance domestic revenue mobilization are indispensable. Equally, improving institutional quality and attracting foreign direct investment can help ECOWAS countries escape the vicious cycle of debt accumulation and low growth.

By situating these findings within the frameworks of the Debt Overhang Theory, the Dual Gap Theory, and the Endogenous Growth Theory, this study provides a comprehensive understanding of the debt-growth nexus in West Africa. In conclusion, external debt can be a tool for development,

but without prudent management and effective institutional frameworks, it risks becoming a persistent drag on economic performance.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. ECOWAS governments should implement strict borrowing frameworks that link new external debt to productive, high-impact investments. Borrowed funds should be transparently allocated to infrastructure, industrial development, and human capital investments to maximize growth potential.

2. To reduce overdependence on external borrowing, West African countries should improve tax collection, formalize the informal economy, and close leakages in public finance systems. This will enhance their fiscal autonomy and create space for public investment

3. Where debt burdens are unsustainable, governments should seek restructuring options, including debt swaps and concessional loans from multilateral partners, to lower repayment burdens and free up fiscal resources for growth-enhancing expenditures

4. Strengthening institutions and enforcing transparent public financial management will improve the effectiveness of debt utilization and attract better financing terms. This also involves strengthening debt monitoring and accountability mechanisms

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