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Original Article

External Debt and Domestic Investment in Selected Ecowas Countries: Role of Institutional Quality

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Abstract: *The persistent accumulation of external debt, coupled with low domestic investment and poor institutional quality in several ECOWAS countries, has raised concerns about the implications of external borrowing for domestic investment. This study explores the impact of external debt on domestic investment and the moderating effect of institutional quality in the relationship between external debt and domestic investment in selected ECOWAS countries. The study utilizes annual data for six ECOWAS countries covering the period 1996–2024. The analysis is carried out using the Cross-Sectional Augmented Autoregressive Distributed Lag (CS-ARDL) estimation technique. The findings establish the existence of a long-run relationship among the variables, as indicated by the appropriately signed and statistically significant error correction term. The results further reveal that external debt service has a significant negative effect on domestic investment in the long run. Furthermore, institutional quality aggravates the negative relationship between external debt and domestic investment. The study suggests that external borrowing by the ECOWAS countries should be directed to projects that will generate income to facilitate repayment of debt and sustain the project. It also calls for an expansion of domestic revenue bases in order to decrease dependence on external borrowing and thus external debt-servicing burdens. Further, the creation of independent and autonomous debt management institutions and an external annual audit on debt management activities are recommended to enhance the transparency, accountability and efficient allocation of external resources.*

Keywords: *Domestic Investment, External Debt, Institutional Quality.*
JEL Classification: E22, F34 and O55

I. INTRODUCTION

Investment has long been regarded as an essential enabler of growth and sustainable development. Investment contributes to the growth of productive capacity through the build-up of physical, technological and human capital, leading to higher labour productivity, higher employment, and better living standards (Akpan et al., 2023; Ojeka et al., 2024). Hence, sustaining adequate domestic investment is a very important policy goal for both developed and developing countries.

However, the ability of an economy to support investment is largely reliant on the availability of financial resources. Investment and economic transformation in many developing countries, especially in Sub-Saharan Africa, are constrained by low domestic savings, underdeveloped financial markets and weak private sector financing (Abdulai et al., 2024). Persistent savings–investment gaps compel governments to seek alternative sources of development finance. It is possible to finance a public development program through increased taxes, or through cuts in public spending, but the spending reductions have economic and social costs, such as reduced private sector activity or reduced household welfare (Lopes da Veiga et al., 2014). As a result, external borrowing has become an essential tool to complement domestic resources and to fund infrastructure development, industrialization and other productive investments (Epaphra & Mesiet, 2021).

According to economic theory, external debt can positively affect domestic investment, as it leads to capital availability and allows governments to fund projects that will yield long-term economic returns. However, it is sustainable external borrowing that will bring benefits; otherwise, it leads to harmful effects. Debt accumulation can lead to debt overhang – a situation in which expectations for higher future taxes and debt service repayments deter both public and private investment, and hence economic growth (Jarju et al., 2016). The relationship between external debt and domestic investment, therefore, remains theoretically inconsistent and is largely dependent on the institutional and macroeconomic environments in each particular country.

In the Economic Community of West African States (ECOWAS) countries, external borrowing has become an important source of development finance, and this issue is of particular importance. As shown in Figure 1, external debt of these countries has increased significantly over the past few years. Although the Heavily Indebted Poor Countries (HIPC) Initiative and debt restructuring programs have been implemented, external debt levels have continued to grow in many ECOWAS countries, particularly since the outbreak of the COVID-19 pandemic, which further aggravated fiscal pressures and

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external financing needs. The average external debt to GNI ratio in ECOWAS has also significantly risen after the pandemic to about 59% in 2024, according to the World Development Indicators. Interestingly, despite the continued rise in external borrowing, domestic investment, as measured by gross capital formation as a share of GDP, has remained rather low and fluctuating, as shown in Figure 2. This divergence warrants important considerations on the effectiveness of external borrowing in facilitating productive investment in the region.

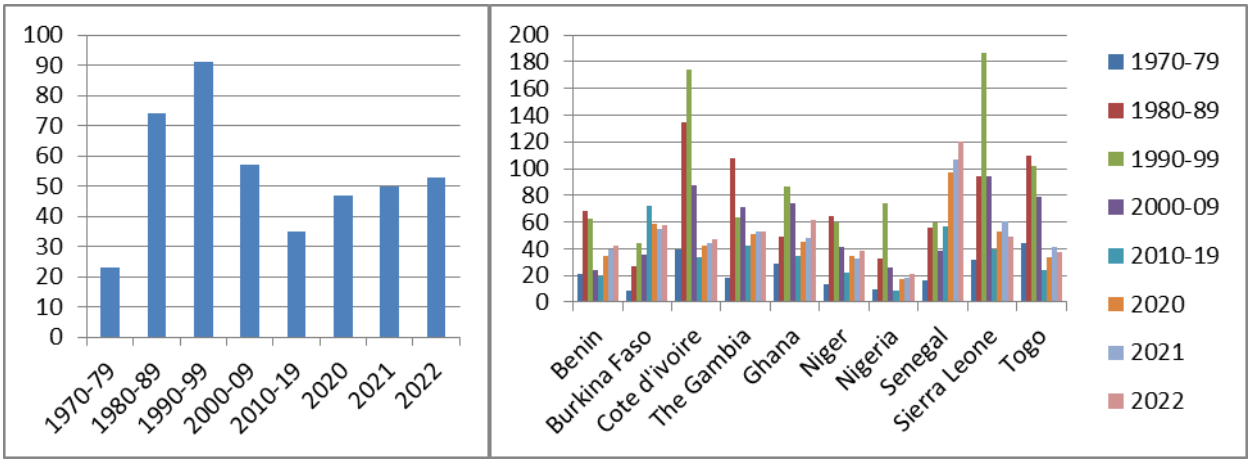


Figure 1a. External Debt Stock (% of GNI, Regional Average) and 1b. External Debt Stock (% of GNI, Individual Countries' data)

Source: *Researcher's compilations from World Development Indicators (WDI)*

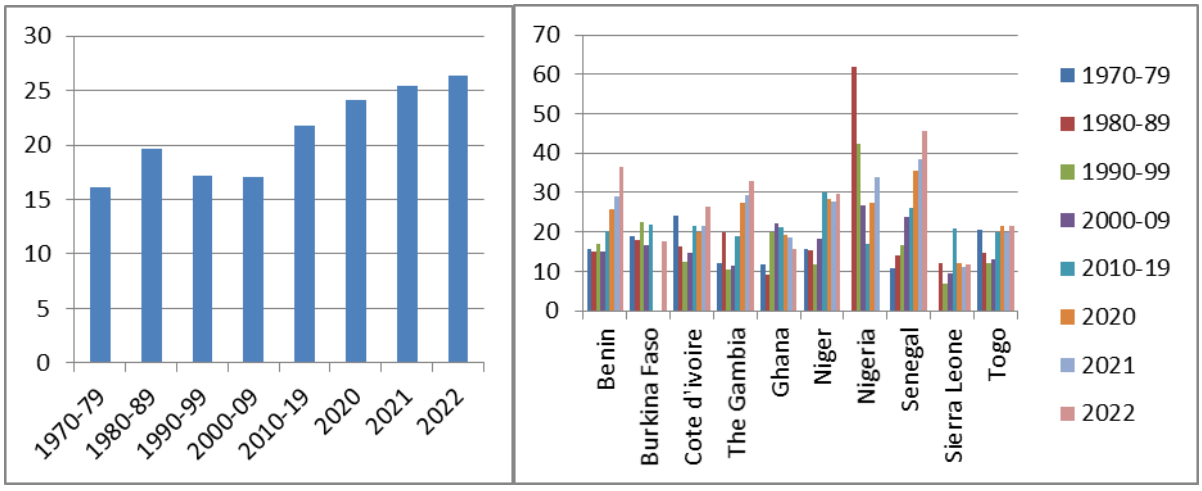


Figure 2a. Gross Capital Formation (% of GDP, Regional Averages) and 2b. Gross Capital Formation (% of GDP, Individual Countries' Data)

Source: *Researcher's Compilations from World Development Indicators*

One possible explanation for this apparent disconnect is the quality of institutions. The quality of institutions shapes the efficacy of external debt in mobilizing, allocating, monitoring, and using borrowed resources. Good institutions, which are transparent, accountable, politically stable, well-regulated, and financially disciplined, boost the efficiency of public investment and strengthen external borrowing productivity (Aswata et al., 2018). On the other hand, weak institutions, which are marked by corruption, poor governance, policy inconsistencies and political instability, divert borrowed resources away from productive investments, raise the debt servicing burden and discourage domestic and foreign investments (Senibi et al., 2017; Aisen & Veiga, 2013; Roe & Siegel, 2011).

Despite the governance reforms instituted in ECOWAS member countries, which include, amongst others, the adoption of democratic governance, the establishment of various anti-corruption bodies and acts, and the creation of the ECOWAS conflict prevention framework (Isukul & Chizea, 2016; Aggad & Miyandazi, 2017), governance indicators continue to show institutional weaknesses. A significant reason for the failure of debt increases to be matched by corresponding increases in investment in the region may be attributable to these weaknesses.

The empirical literature on the external debt-domestic investment relationship has yielded mixed results. Some studies have found that external debt promotes investment by reducing financing pressures, whereas others have found that too much debt restrains investment by leading to instability in the economy and debt overhang. More importantly, there is relatively little research on the moderating effect of institutional quality on the effectiveness of external debt in stimulating domestic investment. The existing studies that include institutional quality are mainly based on advanced economies or a wider sample of Sub-Saharan Africa (SSA) economies, with few studies relevant to ECOWAS. In addition, many of the previous studies use the traditional panel estimation methods, which ignore cross-sectional dependence and slope heterogeneity, making the estimation results biased and inconsistent.

This study seeks to fill these gaps by studying the effect of external debt on domestic investment in selected ECOWAS countries, explicitly exploring the role of institutional quality as a moderator. The study also extends the literature into a region that has received relatively little empirical study and uses the Cross-Sectionally Augmented Autoregressive Distributed Lag Estimator proposed by Chudik and Pesaran (2015). This estimation technique accounts for cross-sectional dependence and slope heterogeneity, thereby providing more robust and reliable estimates than conventional panel estimators.

The results of this study are hoped to supplement the fast-growing body of research on debt sustainability, institutional economics and investment financing, and thus offer evidence on the effectiveness of external borrowing as an instrument of domestic investment in ECOWAS if institutional quality improves. The findings also have policy implications for debt management and governance reform for sustainable economic development in the region.

The rest of the paper is organized as follows: Section 2 reviews the relevant theoretical and empirical literature. Section 3 presents the methodology and data. The empirical results are presented and discussed in Section 4. The study is concluded in Section 5, with policy recommendations in Section 6.

II. LITERATURE REVIEW

A) Theoretical Literature

The basic theories reviewed here are debt overhang theory, crowding-out effect theory and good governance theory.

a. Debt Overhang Theory

The Debt Overhang Theory, first proposed by Howard (1972) and later by Krugman (1988), Corden (1988) and Sachs (1989), argues that debt becomes a disincentive to investment when the debt stock becomes greater than the country's ability to repay it. According to the theory, investors anticipate that future returns from investment will be heavily taxed or diverted towards servicing accumulated debt obligations. As a result, domestic and foreign investors are deterred from investing, which leads to a decrease in investment and economic growth.

Krugman (1988) argues that debt overhang exists when the expected future debt service obligations exceed a country's repayment ability. In such a scenario, the benefits of the additional investment will accrue primarily to external creditors, limiting the incentive to invest. Servén (1997) also points out that if public debt becomes too high, there is macroeconomic uncertainty about future changes in taxes, inflation, and fiscal policy, which can cause private investors to defer investment decisions, lower investment spending, or shift resources toward more stable economies. The Debt Overhang Theory suggests that debt will not be productive beyond a certain limit. High levels of debt lead to uncertainty and lower capital accumulation, which in turn slows the economy's development in the long run, rather than encouraging productive investments.

b. Crowding-Out Effect Theory

The Crowding-Out Effect Theory explains how excessive government borrowing can adversely affect private investment. The theory, championed by Friedman and others who were monetarists, suggests that higher government borrowing leads to higher real interest rates due to the increased demand for loanable funds. When the cost of borrowing is high, firms are deterred from investing in productive activities, and so is the private sector.

The crowding-out effect is not limited to the interest rates channel when it comes to external debt. Cohen (1993), Claessens et al (1996) and Clements et al (2003) claim that increased debt-service requirements create liquidity constraints on governments. The resources that could have been used for infrastructure development, building human resources, and productive public investment are used for servicing external debt. This results in a drop in domestic savings, limited foreign currency earnings, and crowding out of productive investment. The theory then implies that external debt and investment should have a negative relationship, particularly when external debt accumulation leads to heavy external debt-service payments and continued fiscal imbalances.

c. Good Governance Theory

The Good Governance Theory emerged from the World Bank's (1992) report on Governance and Development, which emphasized governance as a prerequisite for sustainable economic development. According to the World Bank, governance is the way political power is used in the governance of a nation's economic and social resources. Likewise, Kaufmann and Kraay (2008) define governance as the traditions and institutions by which authority is wielded in a country.

Good governance involves transparency, accountability, the rule of law, government effectiveness, regulatory quality, political stability and control of corruption. The IMF (2012) notes that these institutional features help to make the public sector more efficient, curb corruption, and ensure effective use of resources. Effective governance structures foster conducive investment environments, allowing property rights to be safeguarded, contracts to be respected, policy predictability to be increased, and domestic and foreign investments to be made (Lindsey et al., 2021; Meyer, 2024).

In the context of external debt, good governance is what shapes and determines whether borrowed resources are used in productive activities that can generate returns to enable repayment of debt. Ojeka et al. (2024) propose that institutional quality is crucial in using borrowed funds efficiently, which helps reduce the negative impact of debt on investment. Hence, the effect of external debt on investment should be reduced by the quality of institutions, which should improve the productivity of external debt used.

B) Empirical Literature

Across countries and regions, the empirical evidence on the debt-investment nexus is still inconclusive, depending on the institutional quality, the composition of external debt, macroeconomic conditions, and the estimation methodology employed.

Several studies provide evidence that excessive external debt discourages investment. Using Ordinary Least Squares (OLS), Ditimi and Oluwagbenga (2017) found that external debt significantly reduced private investment in Nigeria between 1980 and 2014, whereas domestic debt exerted a positive effect. Similarly, Anoke et al. (2021), employing the Vector Error Correction Model (VECM), reported that both domestic and external debt significantly crowd out private investment in Nigeria. Likewise, Akpan et al. (2023), using the Autoregressive Distributed Lag (ARDL) and Error Correction Model (ECM), confirmed the negative effect of public debt on private domestic investment in Nigeria.

Similar evidence also exists for other developing economies. Shiyalini (2021) showed that both domestic and external debt crowded out domestic investment in Sri Lanka in both the short and long run. In Ghana, Fumey et al. (2022) observed negative effects of external debt servicing on public and private capital formation, and the impact was heavier on private capital formation. Kocha et al. (2021) also found that external debt had a negative impact on capital accumulation in Sub-Saharan Africa (SSA), albeit with a weaker short-run impact.

Other studies suggest that the impact of external debt is nonlinear and depends on the level of indebtedness. Kengdo et al. (2020), using the Generalized Method of Moments (GMM), observed that the debt-investment relationship differed across African regional blocs. External debt exerted a negative influence on investment in ECOWAS and CEMAC; however, below specific debt thresholds, external debt positively affected investment in CEMAC and the East African Community (EAC). The results suggest that a moderate level of borrowing can facilitate investment, while a high debt ratio can have a negative impact.

There has been a growing interest in recent years in the importance of institutional quality. Iheonu (2019) employed pooled OLS, fixed effects and random effects estimators in sixteen African nations and concluded that governance indicators (accountability, control of corruption and rule of law) significantly improved domestic investment, whereas government effectiveness was not statistically significant. The same conclusion was reached by Meyer (2024), who showed that the combination of these factors poor governance, growing public debt, and macroeconomic risks – restricts capital formation in South Africa.

The debt-investment relationship has been examined in recent studies, with institutional quality serving as a moderator. Nguyen (2022), studying 36 advanced economies with Pooled Mean Group (PMG) and Difference GMM estimators, found that while government debt overall restricts private investment, high institutional quality enhances investment. Nadabo and Abdullahi (2024) revealed that the influence of external debt on capital formation in Sub-Saharan Africa was moderated by institutional quality, as external debt was a growth-enhancing factor only when institutional quality was above a critical level. Similarly, Ojeka et al. (2024) used two-step GMM and Dynamic Panel Threshold Regression on the groups of forty-seven Sub-Saharan African countries, and found that institutional quality was a key moderator of the adverse impact of external debt on domestic investment. Their findings further revealed that short-term external debt stimulates investment, whereas medium- and long-term debt adversely affects investment.

While the aforementioned studies offer significant evidence on the debt-investment nexus, important gaps still exist. First, most existing literature focuses on the direct impact of external debt on investment without taking into account the intermediate effect of institutional quality. Second, studies that include institutional quality (Nguyen, 2022; Nadabo & Abdullahi, 2024; Ojeka et al., 2024) are either conducted in advanced economies or at the Sub-Saharan African level, with little attention paid specifically to the countries of ECOWAS membership. In the context of the increasing external debt burden of the region and the current push towards economic integration, it is timely and policy relevant to know how institutional quality impacts the debt-investment relationship within ECOWAS.

Moreover, the previous studies mainly used estimation methods like OLS, ARDL, GMM, FMOLS, DOLS, and PMG, which might not be suitable to handle the cross-sectional dependence and slope heterogeneity frequently observed in macro-panel data. In view of this, the present study uses the Cross-Sectionally Augmented Autoregressive Distributed Lag (CS-ARDL) estimator that generates robust and consistent estimates when cross-sectional dependence and heterogeneous slope coefficients are present. This study fills the methodological and contextual gaps in the literature by considering the ECOWAS countries and by introducing institutional quality as a moderating variable within the CS-ARDL framework.

III. METHODOLOGY

A) Theoretical Framework

This study is based on Crowding-Out Effect Theory, which suggests that high government borrowing drives up interest rates and thus reduces private investment. Since external borrowing may reduce the resources available for productive domestic investment through increased debt servicing obligations, the theory provides an appropriate framework for explaining the relationship between external debt and domestic investment. The theoretical framework is also reinforced by the Good Governance Theory, which states that higher governance standards will promote better economic performance by creating accountability, transparency, regulatory effectiveness, political stability and the rule of law (Lindsey et al., 2021; Meyer, 2024). Combining these theories is appropriate for a study on the moderating effect of institutional quality on the relationship between external debt and domestic investment in ECOWAS countries.

B) Model Specification

The empirical model is adapted from Ojeka et al. (2024) with some modifications. In particular, foreign direct investment, trade openness, exchange rate and interest rate were replaced by broad money supply and inflation, which reflect financial sector liquidity and macroeconomic uncertainty and reduce the complexity of the model.

The functional model is defined as

$$GCFR = f(GCFR\text{-}1, EDEBT, EDEBTS, IQ, RGDPR, INF, BMR1) \quad (1)$$

Where: GCFR represents domestic investment, EDEBTR denotes external debt stock, EDEBTS means external debt service, IQ represents the Institutional Quality Index, RGDPR indicates Economic growth, INF represents inflation, and BMR1 denotes broad money.

The moderating effect of institutional quality was explored by adding an interaction term between external debt stock and institutional quality. Data in absolute values were logged to reduce heteroscedasticity and obtain an accurate measurement of elasticity from the slope coefficients; also, treating them as panel data gave the econometric models of the study stated as:

$$GCFR_{it} = \beta_0 + \gamma GCFR_{it-1} + \beta_1 EDEBTR_{it} + \beta_2 LNEDEBTS_{it} + \beta_3 IQ_{it} + \beta_4 EDEBTR*IQ_{it} + \beta_5 RGDPR_{it} + \beta_6 INF_{it} + \beta_7 BMR1_{it} + \varepsilon_{it} \quad (2)$$

Where the parameters are denoted by βs and γ, the error term by ε, and the interactive term by EDEBTR*IQ, where i indicates the group (countries) and t indicates time (Years).

The marginal effect of external debt on domestic investment is therefore obtained as:

$$\frac{\partial GCFR_{it}}{\partial EDEBTR_{it}} = \beta_1 + \beta_4 Q_{it} \quad (3)$$

The interaction coefficient (β4) in equation (3) indicates whether institutional quality strengthens or weakens the effect of external debt on domestic investment. A positive and statistically significant coefficient suggests that institutional quality mitigates the adverse effect of external debt or strengthens the positive effect of external debt on domestic investment, whereas a negative coefficient indicates that weak institutions amplify the adverse effects of external debt or weaken the positive effect of external debt on domestic investment.

a. Measurement of Variables

Domestic investment is a dependent variable in this study and is explained by gross capital formation as a percentage of GDP. External debt stock is measured by total external debt as a percentage of Gross National Income (GNI) and

captures the debt-overhang effect. External debt service is represented by total external debt service and reflects the crowding-out effect due to debt repayment commitments. To achieve normality and to minimize heteroskedasticity, the variable is converted into its natural log.

Institutional quality is measured as a composite index based on Principal Component Analysis (PCA). The index combines the six Worldwide Governance Indicators published by the World Bank, which include Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence, Regulatory Quality, Rule of Law and Voice and Accountability. The six governance indicators are highly correlated, so PCA is used to reduce multicollinearity and generate a single institutional quality index (World Bank, 2025).

The control variables include:

- Economic growth measured by the real GDP growth rate (RGDPR) to account for macroeconomic performance;
- Inflation (INF) explained by the annual percentage change in consumer prices, which accounts for macroeconomic uncertainty.
- Broad money growth (BMR1) is measured as the annual percentage growth in money supply to account for financial sector liquidity.

C) Estimation Technique

The study uses the Cross-Sectionally Augmented Autoregressive Distributed Lag (CS-ARDL) estimator by Chudik and Pesaran (2015). The estimator is preferred because it accommodates:

- cross-sectional dependence,
- heterogeneous slope coefficients,
- mixed order of integration among variables, and
- Dynamic panel structures.

These characteristics are common among ECOWAS countries owing to regional economic integration, policy coordination and exposure to common external shocks (Seraphin & Cyrill, 2023; Voumik & Sultana, 2024).

Unlike conventional panel estimators such as the Mean Group (MG) and Pooled Mean Group (PMG) estimators, which assume cross-sectional independence, the CS-ARDL estimator incorporates cross-sectional averages to capture unobserved common factors and thereby produces consistent and unbiased estimates.

The general CS-ARDL model is written as:

$$y_{it} = \sum_{j=1}^{p} \gamma_{ij} y_{i,t-j} + \sum_{j=0}^{q} \beta_{ij} x_{i,t-j} + \sum_{j=0}^{r} \varphi'_{i,j} \bar{Z}_{i,t-j} + \varepsilon_{it} \quad (4)$$

Where $\bar{Z}_{t-j} = (\bar{y}_{i,t-j}, \bar{x}_{i,t-j})$ refers to lagged cross-sectional averages, p and q indicate the lags for each variable, and r is the number of lags of the cross-sectional averages to be included.

The long-run coefficients in the CS-ARDL approach can be estimated as follows:

$$\hat{\theta}_{CS\text{-}ARDL,i} = \frac{\sum_{j=0}^{p_x} \hat{\beta}_{i,j}}{1 - \sum_{j=1}^{p_y} \hat{\gamma}_{i,j}} \quad (5)$$

Mean group estimates can be obtained as:

$$\hat{\bar{\theta}}_{MG} = \frac{1}{N} \sum_{i=1}^{N} \hat{\theta}_i \quad (6)$$

$\hat{\theta}$ denotes the individual estimation of each cross-section.

The CS-ARDL model for the study, based on Equation (4), is stated as:

$$GCFR_{it} = \alpha_i + \sum_{j=1}^{p} \gamma_{ij} \mathrm{GCFR}_{i,t-j} + \sum_{j=0}^{q} \beta_{ij} x_{i,t-j} + \sum_{j=0}^{r} \varphi'_{i,j} \bar{Z}_{i,t-j} + \varepsilon_{it} \quad (7)$$

Where

$$x_{it} = (EDEBTR_{it},\ LNEDEBTS_{it},\ IQ_{it},\ EDEBTR*IQ_{it},\ RGDPR_{it},\ INF_{it},\ BMR1_{it}) \text{ and}$$

$$\bar{Z}_t = (\overline{\Delta GCFR_{it}},\ \Delta\overline{EDEBTR}_t,\ \overline{\Delta LNEDEBTS_t},\ \Delta\overline{IQ}_t,\ \overline{\Delta EDEBTR * IQ_t},\ \Delta\overline{RGDPR}_t,\ \overline{\Delta INFt_t},\ \Delta BMR1_t)$$

The error correction form of the CS-ARDL model is stated as:

$$\Delta GCFR_{it} = \emptyset_{\mathrm{i}}\left[GCFR_{i,t-j} - \hat{\theta}_{\mathrm{i}} x_{i,t}\right] - \alpha_{\mathrm{i}} + \sum_{j=1}^{p} \gamma_{ij} \Delta_{\mathrm{j}} \mathrm{GCFR}_{i,t-j} + \sum_{j=0}^{q} \beta_{ij} \Delta_{\mathrm{j}} x_{i,t-j} + \sum_{j=0}^{r} \varphi'_{\mathrm{i,j}} \Delta_{\mathrm{j}} \bar{Z}_{i,t-j} + \mu_{it} \quad (8)$$

Where $\emptyset_{\mathrm{i}}$ denotes the error correction speed of adjustment.

a. Preliminary Diagnostic Tests

Prior to estimation, several diagnostic procedures were carried out.

b. Cross-sectional Dependence Test

The Breusch–Pagan Lagrange Multiplier (LM) test was used to check for cross-sectional dependence. The test is suitable when the time dimension is larger than the cross-sectional dimension (T > N) and identifies whether the shocks in one country have an impact on other countries.

c. Slope Homogeneity Test

Slope homogeneity was investigated using the Pesaran and Yamagata (2008) Delta and Adjusted Delta tests. The test checks if the slope coefficients are homogeneous among countries. Rejection of the null hypothesis indicates heterogeneous slope coefficients, thereby justifying the use of the Mean Group CS-ARDL estimator.

d. Panel Unit Root Test

After confirming the cross-sectional dependence, the study used Cross-Sectional Augmented Dickey-Fuller (CADF) and Cross-Sectional Im-Pesaran-Shin (CIPS) unit root tests developed by Pesaran (2007). These second-generation unit root tests explicitly allow for cross-sectional dependence and identify the order of integration of variables.

Descriptive statistics and Pearson correlation analysis were also conducted to summarize the characteristics of the variables and examine possible multicollinearity among the explanatory variables.

D) Data Sources

This study relies on annual panel data over the period 1996–2024 for six ECOWAS countries (Cote d'Ivoire, Gambia, Ghana, Niger, Nigeria and Senegal). The study period was determined by the availability of governance indicator data, which commenced in 1996. All the data were sourced from the World Development Indicator (WDI) database.

IV. EMPIRICAL RESULTS AND DISCUSSION

A) Descriptive Statistics and Correlation Analysis

The descriptive statistics and pairwise correlation coefficients of the variables used in the study are shown in Table 1. The descriptive statistics indicate that gross capital formation (GCFR), used as a proxy for domestic investment, recorded an average value of 21.98% of GDP, suggesting that investment levels in ECOWAS countries remain relatively low throughout the study period. Average external debt stock was 53.49% of GNI, and external debt service stood at around US$1.3 billion, indicating the high reliance of ECOWAS economies on external financing and the large repayment requirements on external financing. Average institutional quality was near zero, reflecting long-term poor institutional performance in the sampled countries. The real GDP growth averaged 4.47 percent, the inflation rate was 7.69 percent, and the broad money supply averaged 17.49 percent.

The dispersion measures reveal considerable differences in macroeconomic conditions across the region. The variability of gross capital formation, institutional quality and economic growth is relatively low, while that of external debt stock, debt service, inflation and broad money is relatively high, indicating variability in fiscal capacity, borrowing pattern and macroeconomic management among ECOWAS member states. The skewness and kurtosis statistics show that most of the variables are not normally distributed, and that they have extreme observations; the Jarque-Bera statistics show that the null hypothesis of normal distribution is rejected for all the variables. The distributional features warrant the use of robust panel estimation procedures.

The correlation matrix indicates generally weak associations among the explanatory variables. Domestic investment is weakly and positively associated with economic growth, inflation and broad money supply but negatively associated with external debt stock, debt service and institutional quality. More importantly, no correlation coefficient is above 0.80, which is considered the limit for severe multicollinearity and indicates that the explanatory variables do not present much overlapping information for the model estimation.

Table 1: Descriptive Statistics and Correlation Matrix

Descriptive Statistics							
	GCFR	EDEBTR	EDEBTS	IQ	RGDPR	INF	BMR1
Mean	21.98099	53.49109	1.30E+09	-1.68E-16	4.468630	7.691386	17.49277
Median	2.68273	50.13342	3.86E+08	0.030346	4.671842	4.817252	14.45685
Maximum	52.84743	173.9564	1.35E+10	3.627563	15.32916	46.56102	87.76135
Minimum	4.562498	6.990258	14507500	-4.617676	-8.130444	-2.489793	-27.679934
Std. Dev.	8.338385	32.94323	2.13E+09	2.169111	3.318667	8.640832	15.58465
Skewness	0.606447	1.113575	2.828609	-0.200959	-0.400170	1.991174	1.047268
Kurtosis	3.751034	4.323557	12.07105	2.018045	4.652006	7.681943	6.763393
Jarque Bera	14.75495	48.66198	828.5880	8.161853	24.43010	273.9028	134.4890
Probability	0.00625	0.000000	0.000000	0.016892	0.000005	0.000000	0.000000
Correlation Matrix							
GCFR	1						
EDEBTR	-0.048	1					
EDEBTS	0.348	-0.124	1				
IQ	-0.002	0.237	-0.143	1			
RGDPR	0.151	-0.136	0.003	0.164	1		
INF	0.166	0.154	0.364	0.061	0.037	1	
BMR1	0.135	0.027	0.232	0.127	0.112	0.470	1

Source: *Researchers' Compilation from World Development Indicators*

B) Cross-Sectional Dependence Test

The Breusch-Pagan LM test in Table 2 strongly rejects the null hypothesis of cross-sectional independence at the 5% significance level. This finding, therefore, supports the view that even macroeconomic shocks to one member state of ECOWAS are passed on to other member states, which indicates economic integration and the vulnerability of the region to external shocks. Thus, the estimators that fail to account for cross-sectional dependence would yield biased and inconsistent estimates. The result thus substantiates the application of second-generation panel estimation methods that can allow for such dependence.

Table 2: Breusch-Pagam LM Cross-Sectional Dependence Test

	Chi2(15)	Pr
GCFR = f(EDEBTR, LNEDEBTS, IQ, EDEBTRIQ, RGDPR, INF, BMR1)	72.987	0.0000***

Note: **** indicate significance at 5%. Pr is the probability value.*
Source: *Researchers' computation using STATA*

Table 3: Slope Homogeneity Test

	Delta	P.value
Δ test	7.077	0.000***
Δ_{Adj} test	8.521	0.000***

Note: **** indicates significance at 5%.*
Source: *Researchers' computation using STATA*

C) Slope Homogeneity Test

The Pesaran and Yamagata slope homogeneity test in Table 3 shows that there are statistically significant Delta and adjusted Delta statistics, which indicates that the null hypothesis of homogeneous slope coefficients is rejected. This implies that the impact of external debt and the control variables differs across ECOWAS countries owing to variations in institutional capacity, fiscal policy frameworks, debt management practices and structural economic characteristics. Hence, a heterogeneous panel estimator is appropriate for the study.

D) Unit Root Test

The order of integration of the variables was identified using the Cross-sectionally Augmented Dickey-Fuller (CADF) and Cross-sectionally Augmented IPS (CIPS) tests after establishing that the variables are cross-sectionally dependent. The results in Table 4 indicate a mixed order of integration, with some variables stationary at levels and others becoming stationary after first differencing. Specifically, real GDP growth and inflation are integrated of order zero, whereas gross capital formation, external debt stock, external debt service, institutional quality and broad money are integrated of order one. The mixed order of integration in the data is further justification for the use of the Cross-Sectional Autoregressive Distributed Lag (CS-ARDL) estimator.

Table 4: Report of CIPS and CADF unit Tests

Variables	CIPS			CADF			Decision
	Level	1st Difference		Level	1st Difference		
GCFR	-2.285	-4.831***		-2.204 (0.610)	-2.500 (0.031)**		I(1)
EDEBTR	-1.952	-5.395***		-1.294 (0.996)	-3.616 (0.000)***		I(1)
LNEDEBTS	-3.052**	-5.829***		-1.774 (0.921)	-3.321 (0.004)***		I(1)
IQ	-1.699	-3.949***		-1.765 (0.924)	-2.367 (0.063)**		I(1)
RGDPR	-3.942***	-		-3.268 (0.006)***	-		I(0)
INF	-4.8282***	-		-2.759 (0.118)*	-		I(0)
BMR1	-4.736***	-6.151***		-2.702 (0.151)	-3.872 (0.000)***		I(1)

Note: **, ** and *** represent significance at 10%, 5% and 1% respectively. P-values are in parenthesis.*
Source: *Researchers' computation using STATA*

E) Long-Run and Short-Run CS-ARDL Estimates

The CS-ARDL estimates in Table 5 confirm the existence of a stable long-run equilibrium relationship among the variables. The error correction coefficient is statistically significant and has the correct sign, suggesting that about 57% of the short-run disequilibrium in the domestic investment model is corrected in one year. The high speed of adjustment shows the robustness of the estimated long-run relationship.

Empirical results also show that the external debt stock does not have a statistically significant impact on domestic investment both in the long run and short run. This discovery indicates that there is no direct deterrent effect of the level of external borrowing on domestic investment. On the contrary, the developmental impact of external debt will greatly rely on the use of borrowed money and its repayment liability. The result contrasts with the findings of Anoke et al. (2021) and Kengdo et al. (2020), who documented a significant negative relationship between external debt stock and domestic investment.

Table 5: Long-Run and Short-Run Results of the CS-ARDL Technique

Variables	Long Run Result			Short Run Result	
	Co, Ste, Z	P-value		Co, Ste, Z	P-value
Adjusted Term (ECT)	-	-		0.565 (0.233) [-2.42]	0.015**
GCFR	-	-		0.435 (0.233) [1.87]	0.062
EDEBTR	-0.130 (0.307) [-0.42]	0.671		0.144 (0.074) [1.96]	0.050
LNEDEBTS	-2.813 (1.114) [-2.53]	0.012**		-1.969 (1.382) [-1.42]	0.154
IQ	-7.809 (5.927) [-1.32]	0.188		2.029 (1.419) [1.43]	0.153
EDEBTRIQ	0.179 (0.165) [1.09]	0.278		-0.059 (0.024) [-2.51]	0.012**
RGDPR	-1.294 (1.032) [-1.25]	0.210		0.282 (0.137) [2.05]	0.040**
INF	-0.643 (1.114) [-0.58]	0.564		0.364 (0.138) [2.63]	0.009**
BMR1	0.211 (0.177) [1.19]	0.233		-0.061 (0.21) [-2.97]	0.003**

Note: *Co = coefficient, Ste () = Standard error, Z [] = Z-statistics, ** = significant at 5%.*
Source: *Researchers' computation from Stata.*

External debt service, on the other hand, shows a statistically significant negative relationship with domestic investment in the long term. Specifically, in the long run, an increase in external debt service of one per cent corresponds to a decrease in domestic investment of around 2.81 per cent. The evidence shows that debt servicing commitments are the key transmission channel through which external debt imposes a constraint on investment in ECOWAS countries. The increased debt service reduces fiscal resources available for productive public investment, which limits infrastructure development and thus the complementary public investment needed to encourage private sector participation. This inevitably leads to reduced domestic capital formation as governments devote more and more of the proceeds of exports and public revenues to external obligations. These findings support the crowding-out hypothesis with strong empirical evidence and confirm the evidence reported by Fumey et al. (2022).

The moderating effect of institutional quality is found to be statistically significant in the short run, even though the effect is minimal. A one percent increase in the interactive term decreases domestic investment by 0.06 percent. This means that institutional quality aggravates the negative relationship between external debt and domestic investment in the sampled ECOWAS countries. This finding implies that current institutional arrangements are too inadequate to counter the negative effects of increased debt service demands. Institutions may have had limited capacity to ensure that borrowed resources were used to fund productive projects that could provide sufficient returns to finance future debt obligations because of weak governance, poor fiscal transparency, corruption and poor public financial management, as well as regulatory inefficiencies. This result contradicts the study results of Nadabo and Abdullahi (2024) and Ojeka et al. (2024), which find that institutional

quality enhances the relationship between debt and investment, while it aligns with the findings of Nguyen (2022) that institutional quality deteriorates the external debt-domestic investment relationship.

Among the control variables, economic growth positively stimulates domestic investment in the short run, reflecting improved investment opportunities during periods of economic expansion. The effect of inflation is also positive and statistically significant in the short run, indicating that moderate inflation was accompanied by a rise in economic activity during the period covered by the study. At the same time, the expansion of broad money has had adverse impacts on domestic investment, suggesting that financial expansion has not coincided with productive capital formation, perhaps because credit has been allocated toward financing the government and consumption rather than productive private investment.

V. CONCLUSION

This study examined the effect of external debt on domestic investment and investigated whether institutional quality moderates the external debt–domestic investment relationship in six ECOWAS countries over the period 1996–2024 using the Cross-Sectional Autoregressive Distributed Lag (CS-ARDL) estimator. The presence of cross-sectional dependence, heterogeneous slope coefficients and mixed orders of integration for the variables warranted the use of the CS-ARDL approach.

The results of the empirical analysis indicate that external debt stock has no significant effect on domestic investment. However, external debt service has a significant negative impact on domestic investment in the long run, which means that limitations on capital formation in ECOWAS countries are more related to the burden of repaying debts than accumulating them. The findings thus support the crowding-out hypothesis that the burden of debt repayments takes resources away from productive investment.

The study also concludes that institutional quality alters the relationship between external debt and domestic investment in a negative way. The discovery implies that the current institutional setting in ECOWAS countries is too weak, which aggravates the negative effects of debt service on domestic investment. It is inferred from the study that sustainable debt management in the ECOWAS region should not only aim at curbing excessive borrowing, but it should also aim at generating adequate economic returns from borrowed funds to support the financing of future debts without doing more harm than good to domestic capital formation.

VI. POLICY RECOMMENDATIONS

The following policy recommendations are presented on the basis of the empirical results:

- Giving utmost attention to productive debt utilization. External borrowing should only be availed for economically viable projects with self-liquidating features that will generate enough cash to meet future debt-servicing requirements. Borrowing for recurrent expenditure or politically motivated projects should be discouraged.
- Reinforcing the framework for debt sustainability. ECOWAS governments should adopt comprehensive debt sustainability strategies that integrate borrowing decisions with expected project returns, debt servicing capacity and medium-term fiscal sustainability to prevent excessive debt service burdens.
- Improve the mobilization of domestic revenues. Governments should broaden the tax base through tax administration reforms, digital revenue collection systems and the reduction of tax leakages. Efforts to enhance domestic revenue mobilisation would help limit external borrowing and ease future debt service requirements.
- Improve public expenditure efficiency. Fiscal discipline should be strengthened by reducing wasteful government expenditure, eliminating inefficient subsidies, improving public procurement systems and ensuring value-for-money in public investment projects. This would provide more budget resources for productive investment.
- Strengthen debt management institutions. Independent and professional debt management offices should be given the authority to carry out an in-depth project appraisal, debt sustainability analysis and ongoing monitoring of externally funded projects. In addition, regular independent audits should be institutionalized to enhance accountability and transparency of debt use.
- Deepen institutional reforms. Since institutional quality worsens the already existing negative relationship between external debt and domestic investment, the enhancement of governance is necessary to boost the overall efficiency of the public sector. Efforts to address corruption, the rule of law, regulatory quality, fiscal transparency and political stability will have a positive impact on external borrowing effectiveness over time.
- Promote investment-friendly macroeconomic policies. Governments should ensure macroeconomic stability, enhance the provision of infrastructure, and improve financial intermediation to attract private investment and minimize negative investment effects from high external debt service requirements.

Conflicts of Interest

Authors 1, 2 and 3 declare that they do not have conflicts of interest regarding the publication of this paper.

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