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A Dynamic Analysis of External Debt and Governance Quality on Economic Growth in selected Sub-Saharan African countries

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Abstract

This study examines the effects of external debt and governance quality on economic performance in selected Sub-Saharan African economies. Specifically, the study focuses on Nigeria, Angola, Kenya, and South Africa over the period 1996–2024. Employing a panel Autoregressive Distributed Lag (ARDL) approach, the study accounts for mixed orders of integration and distinguishes between short-run and long-run dynamics. The unit root results indicate a combination of I(0) and I(1) variables, justifying the application of the ARDL technique. The findings from the error correction model confirm the existence of a long-run equilibrium relationship among the variables. In the long run, external debt exerts a negative and statistically significant effect on economic performance, suggesting that rising debt levels constrain growth in the selected economies. In contrast, governance quality, proxied by control of corruption, does not exhibit a statistically significant impact on economic performance. Similarly, exchange rate and real interest rate show insignificant effects in the long run. In the short run, none of the explanatory variables significantly influence economic performance, indicating that their effects are largely long-term. The study concludes that external debt remains a critical determinant of economic performance in Sub-Saharan Africa, while the growth effects of governance may be indirect or context-specific. The findings emphasise the need for prudent debt management and improved institutional frameworks to enhance the effectiveness of borrowing and support sustainable economic growth.

Keywords: *External Debt, Governance Quality, Economic Performance, Panel ARDL, Sub-Saharan Africa*

1. Introduction

External borrowing has become an important component of macroeconomic management in many Sub-Saharan African countries, where governments rely on external debt to finance infrastructure, stabilise fiscal balances, and support development programmes (Were, 2024). While external debt can support economic growth, excessive accumulation has been associated with debt overhang, macroeconomic instability, and reduced economic performance (Edo et al., 2020; Turan & Yanıkkaya, 2021). The mixed evidence on the debt–growth relationship suggests that the effectiveness of external borrowing depends on country-specific structural and institutional conditions (Panizza & Presbitero, 2014).

Governance quality is also recognised as an important determinant of economic performance. Effective institutions enhance resource allocation efficiency and promote sustainable growth, whereas weak governance structures hinder economic performance through inefficiencies and misallocation of public resources (Kaufmann et al., 2010; Mehmood et al., 2021). However,

empirical evidence on the direct impact of governance remains mixed, particularly in Sub-Saharan Africa (Beyene, 2021).

Existing studies largely focus on aggregate relationships between public debt and economic growth, with limited attention to the joint role of external debt and governance quality (Mensah et al., 2018). In addition, many studies rely on static techniques or do not adequately distinguish between short-run and long-run dynamics (Asteriou et al., 2020), while cross-country evidence incorporating governance within a dynamic framework remains limited for selected African economies (Abotsi & Ampah, 2024).

This study addresses these gaps by examining the impact of external debt on economic performance while incorporating governance quality within a dynamic panel framework. It focuses on Nigeria, Angola, Kenya, and South Africa, selected for their economic significance and varying institutional conditions (World Bank, 2024b; IMF, 2020). By capturing both short-run and long-run dynamics using the panel ARDL approach, the study provides a more nuanced understanding of how external debt and governance influence economic performance.

This study makes three contributions. First, it provides empirical evidence on the direct effects of external debt and governance quality within a dynamic panel framework. Second, it offers country-specific insights for selected African economies. Third, it provides policy-relevant insights by distinguishing between short-run and long-run dynamics. The remainder of the paper is structured as follows. Section 2 presents the literature review, Section 3 outlines the methodology, Section 4 discusses the results, while Section 5 concludes the study.

2. Literature Review

External debt refers to financial obligations owed by a country to international creditors, including multilateral institutions, bilateral lenders, and private investors (Mohsin et al., 2021). In developing economies, external borrowing is often used to finance infrastructure and development, thereby easing domestic savings constraints and supporting capital formation (Otieno, 2023). However, excessive debt accumulation may create macroeconomic vulnerabilities, particularly when debt servicing crowds out productive expenditure or when borrowed funds are inefficiently utilised (Yasar, 2021).

Governance quality reflects the effectiveness of institutions in managing public resources and ensuring accountability (Kaufmann et al., 2010). Strong governance enhances transparency and resource allocation efficiency, thereby supporting economic performance, while weak institutions undermine economic outcomes (Mehmood et al., 2021).

The debt-overhang theory explains the negative relationship between public debt and economic growth, suggesting that excessive debt discourages investment due to expectations of future taxation or macroeconomic instability (Krugman, 1988). This theoretical linkage is further supported by recent empirical evidence highlighting the adverse growth effects of excessive borrowing in developing economies (Turan & Yanıkkaya, 2021). Institutional theory also emphasises that strong governance structures enhance fiscal discipline and economic outcomes (Rodrik, 2008).

2.1 Empirical Review

Empirical evidence on the relationship between external debt and economic performance remains mixed. Edo et al. (2020), examining the impact of external debt on economic growth using panel data for Sub-Saharan Africa, found that external debt negatively affects economic growth, supporting the debt-overhang hypothesis. Similarly, Turan and Yanıkkaya (2021), analysing the relationship between external debt and growth using panel regression for developing countries, reported that excessive debt accumulation constrains growth.

In contrast, Mohsin et al. (2021), investigating the role of external debt in economic growth using quantile regression, found that external debt can promote growth when efficiently managed under favourable macroeconomic conditions.

Empirical findings on governance are also inconclusive. Beyene (2021), examining the effect of governance on economic growth using a dynamic panel model, found that governance quality enhances economic performance, while Al-Naser and Hamdan (2021), analysing governance and growth using panel techniques, reported similar positive effects. However, Mehmood et al. (2021), investigating governance and economic performance using country-level data, found no significant direct impact.

Recent studies consider both debt and governance. Musa et al. (2023), examining the relationship between public debt, governance, and growth using quantile regression, found governance significantly shapes macroeconomic outcomes. Oppong (2023), analysing the debt–growth nexus using panel estimation, reported that institutional quality influences growth, while Abotsi and Ampah (2024), examining debt and governance using panel data for African countries, found that governance plays a critical role in the debt–growth relationship. These mixed findings justify further investigation using a dynamic panel framework.

2.2 Gaps in Literature

Despite the growing literature, relatively few studies jointly examine the direct effects of external debt and governance quality within a dynamic panel framework that distinguishes between short-run and long-run dynamics. In addition, country-specific evidence for key African economies such as Nigeria, Angola, Kenya, and South Africa remain limited.\ This study addresses these gaps by employing a panel ARDL approach to analyse the direct effects of external debt and governance quality on economic performance while capturing both short-run and long-run dynamics

3. Methodology

A quantitative panel research design is employed to analyse the influence of external debt and governance quality on economic performance. Annual data for Nigeria, Angola, Kenya, and South Africa were drawn from the World Development Indicators and the Worldwide Governance Indicators for the period 1996–2024. Economic performance is proxied by GDP per capita growth (GDPPC), while external debt (EXD), exchange rate (EXR), real interest rate (RIR), and control of corruption (COC) are included as explanatory variables. External debt is measured as a percentage of GDP, exchange rate as the official rate (local currency per US dollar), real interest rate as the inflation-adjusted lending rate, and control of corruption as an index ranging from –2.5 to +2.5, with higher values indicating better institutional quality. These

variables capture key macroeconomic and institutional factors expected to influence economic performance through debt burden, price stability, cost of capital, and governance effectiveness.

To examine the dynamic relationships among the variables, this study employs a panel ARDL model estimated using the Pooled Mean Group (PMG) and Mean Group (MG) estimators (Pesaran et al., 1999, 2001). The panel ARDL approach is suitable as it accommodates variables with mixed orders of integration and captures both short-run and long-run dynamics.

Importantly, the model addresses cross-country heterogeneity, which is inherent in panel data involving economies with diverse structural and institutional characteristics. While the PMG estimator allows for heterogeneous short-run dynamics with a common long-run relationship, the MG estimator permits full heterogeneity across countries. The choice between the estimators is guided by the Hausman test.

3.1 Model Specification

This study examines the long-run equilibrium and short-run dynamics of external borrowing on economic performance in selected Sub-Saharan African economies. The empirical model is specified below

$$\boldsymbol{GDPPC_{it} = f(EXD_{it}, EXR_{it}, RIR_{it}, COC_{it})}$$

where:

- $GDPPC$ represents GDP per capita growth rate,
- EXD denotes external debt,
- EXR is the exchange rate,
- RIR represents the real interest rate, and
- COC captures control of corruption as a governance indicator.

To reduce scale effects and address skewness in the data, external debt and exchange rate are transformed into natural logarithms. The estimated model therefore becomes:

$$GDPPC_{it} = \alpha_i + \beta_1 \ln(EXD_{it}) + \beta_2 \ln(EXR_{it}) + \beta_3 RIR_{it} + \beta_4 COC_{it} + \varepsilon_{it}$$

where $i$and $t$denote country and time respectively; $\alpha_i$represents country-specific fixed effects that capture unobserved heterogeneity across countries; β_1–$\beta_4$are the long-run slope coefficients; ε_{it} denotes the stochastic error term, which is assumed to have a zero mean and constant variance.

3.2 Estimation Technique

The study adopts a small-N, large-T panel structure, which is suitable for PMG estimation since the estimator performs reliably in situations where the time dimension is larger than the cross-sectional dimension. Given the panel structure and the possibility of mixed orders of integration among the variables, the Panel Autoregressive Distributed Lag (Panel ARDL) framework is employed (Pesaran et al., 1999; Pesaran et al., 2001). The ARDL approach is appropriate for variables integrated at orders I(0) and I(1), but not at I(2). The dynamic specification allows both short-run dynamics and long-term equilibrium relationships to be estimated simultaneously. The ARDL (p, q_1, q_2, q_3, q_4) specification incorporates lags of the dependent

variable and distributed lags of the regressors. Given the panel's limited cross-sectional dimension and the need to preserve degrees of freedom, a parsimonious ARDL (1,1,1,1,1) specification was adopted. This lag structure captures short-run dynamics while avoiding over-parameterization that may arise in small samples.

The ARDL model is estimated in error correction form, which can be expressed as:

$$\Delta GDPPC_{it} = \phi_i(GDPPC_{it-1} - \theta_1 \ln(EXD_{it-1}) - \theta_2 \ln(EXR_{it-1}) - \theta_3 RIR_{it-1} - \theta_4 COC_{it-1}) + \sum \gamma_{ij} \Delta X_{it} + \varepsilon_{it}$$

where:

- $\phi_i$represents the speed of adjustment coefficient,
- θrepresents long-run coefficients,
- Δdenotes first difference

4. Discussion of results

Table 4.1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis	JB (Prob.)
GDPPC	1.438	3.412	-8.342	12.21	0.17	4.303	8.770(0.012)
EXD	40.656	38.656	6.296	223.248	2.49	9.947	353.113(0.000)
RIR	130.135	198.875	0.128	1478.97	3.818	21.983	2023.375(0.000)
EXR	2.757	16.272	-93.51	36.7	-3.264	17.909	1280.273 (0.000)
COC	-0.462	0.643	-1.779	0.776	-0.056	2.164	3.440 (0.179)

Observations = 116

Source: Author's computation (2026)

Table 4.1 presents the descriptive statistics of the variables. GDP per capita growth averages 1.44%, indicating modest economic performance across the sampled countries, with fluctuations reflecting periods of both expansion and contraction. External debt exhibits substantial variation, suggesting differences in borrowing patterns and potential sustainability concerns across countries.

Real interest rate shows high volatility, indicating unstable financial conditions that may affect investment and growth. Similarly, exchange rate fluctuations point to macroeconomic instability, which can disrupt trade and economic performance. The control of corruption index has a negative mean, reflecting generally weak institutional quality, which may limit the effectiveness of public resource management. The Jarque-Bera statistics indicate that most variables are not normally distributed, suggesting the presence of skewness and extreme values, a common feature in macroeconomic panel data.

Table 4.2: Correlation Matrix Result

Variable	GDPPC	EXD	EXR	RIR	COC
GDPPC	1.000	-0.210	-0.177	-0.090	-0.029
EXD	-0.210	1.000	0.116	-0.600	-0.499
EXR	-0.177	0.116	1.000	-0.005	0.188
RIR	-0.090	-0.600	-0.005	1.000	0.225
COC	-0.029	-0.499	0.188	0.225	1.000

Source: Author's computation (2026)

Table 4.2 presents the correlation matrix of the variables. The results show generally low to moderate correlations, indicating that multicollinearity is not a concern in the model. GDP per capita growth (GDPPC) is weakly and negatively correlated with external debt (–0.210), exchange rate (–0.177), real interest rate (–0.090), and control of corruption (–0.029), suggesting that increases in these variables are associated with lower economic performance, although the relationships are not strong. External debt shows a moderate negative correlation with real interest rate (–0.600) and governance quality (–0.499), indicating that higher debt levels tend to be associated with tighter financial conditions and weaker institutions. Other relationships among the variables are generally weak. Overall, the low correlation coefficients suggest that the variables do not exhibit strong linear relationships, supporting the use of a dynamic panel approach for further analysis.

4.3 Cross-Sectional Dependence Test

Cross-sectional dependence among the sampled countries was assessed using the Pesaran (2004) CD test. The result (CD = 4.26, p = 0.00002) indicates the presence of significant cross-sectional dependence. This outcome is not unexpected, given that the selected economies, namely Nigeria, Angola, Kenya, and South Africa, are integrated into the global financial system and are exposed to common external shocks such as fluctuations in commodity prices, exchange rate movements, and global interest rate dynamics. In addition, regional economic linkages and similar macroeconomic policy responses may generate spillover effects across these countries.

Although cross-sectional dependence is present, the relatively small cross-sectional dimension (N = 4) limits the applicability of second-generation panel techniques. However, the PMG and MG estimators remain appropriate for small-N, large-T panels and allow for heterogeneity across countries. The results are therefore interpreted with caution, acknowledging the presence of cross-country interdependencies.

Table 4.4: Unit Root Test Result

Variable	LLC	IPS	ADF	PP	LLC	IPS	ADF	PP	Order
	Level				1st Difference				
GDPPC	-2.21 (0.01)	-2.059 (0.02)	16.541 (0.03)	34.352 (0.00)	–	–	–	–	I(0)
EXD	1.015 (0.84)	2.610 (0.99)	3.857 (0.87)	6.440 (0.59)	-1.796 (0.03)	-2.932 (0.00)	29.210 (0.00)	51.510 (0.00)	I(1)
EXR	4.744 (1.00)	4.969 (1.00)	0.255 (1.00)	0.104 (1.00)	1.049 (0.85)	-1.639 (0.05)	28.773 (0.00)	39.285 (0.00)	I(1)
RIR	-1.221 (0.11)	-2.633 (0.00)	20.290 (0.01)	45.669 (0.00)	–	–	–	–	I(0)
COC	1.339 (0.91)	1.324 (0.91)	4.570 (0.80)	12.579 (0.13)	-0.754 (0.23)	-4.007 (0.00)	30.615 (0.00)	81.468 (0.00)	I(1)

Source: Author's computation (2026)

Notes: LLC, IPS, ADF, and PP denote Levin, Lin & Chu; Im, Pesaran and Shin; Augmented Dickey-Fuller; and Phillips-Perron tests.

The panel unit root results presented in Table 4.4 indicate that the variables exhibit mixed orders of integration. GDP per capita (GDPPC) and real interest rate (RIR) are stationary at level, as confirmed by the significance of the IPS, ADF, and PP statistics. This implies that these variables are integrated of order zero, I(0). In contrast, external debt (EXD), exchange rate (EXR), and control of corruption (COC) are non-stationary at level but become stationary after first differencing, indicating that they are integrated of order one, I(1). The presence of both I(0) and I(1) variables justifies the use of the panel ARDL estimation technique, which accommodates variables with mixed integration orders but excludes I(2) variables.

Table 4.5: Co-integration Test Result

Variable	Coefficient	Prob.	Decision
ECM(-1)	-0.794	0.000***	Cointegration confirmed

Source: Author's computation (2026)

Following the confirmation of mixed integration orders, the study proceeds to examine the existence of a long-run relationship among the variables using the ARDL framework. The error correction term (ECM) reported in Table 4.5 is negative and statistically significant (–0.794, $p < 0.01$), confirming the presence of cointegration among the variables. This satisfies the requirement for establishing a long-run equilibrium relationship prior to ARDL estimation. The magnitude of the ECM coefficient implies that approximately 79% of short-run deviations from equilibrium are corrected within one period, indicating a relatively fast speed of adjustment. This finding suggests that external debt, governance quality, and other macroeconomic variables jointly converge to a stable long-run equilibrium relationship.

Table 4.6: PMG Estimation Results

Variable	Long-run Coefficient	p-value
LNEXD	-3.847	0.000
LNEXR	0.232	0.705
RIR	-0.024	0.593
COC	-1.074	0.308
Variable	Coefficient	p-value
ECT (-1)	-0.794	0.000
ΔLNEXD	0.279	0.906
ΔLNEXR	-3.864	0.032
ΔRIR	0.010	0.820
ΔCOC	-3.301	0.280
Constant	10.423	0.000

Source: Author's computation (2026)

To address scale differences and skewness, external debt and exchange rate were transformed into natural logarithmic forms. The model was estimated using an ARDL(1,1,1,1,1) specification under the Pooled Mean Group (PMG) estimator. In the long run, external debt (LNEXD) has a negative and statistically significant effect on economic performance, supporting the debt-overhang hypothesis. In contrast, exchange rate, real interest rate, and control of corruption do not exhibit significant long-run effects, indicating limited direct influence within the pooled framework.

In the short run, exchange rate changes have a negative and significant effect on economic performance, suggesting that exchange rate volatility may disrupt economic activity, while other variables remain insignificant. The insignificant effect of governance may reflect cross-country heterogeneity, consistent with the Mean Group (MG) results, which indicate that institutional effects vary across countries. Overall, the findings highlight the dominant role of external debt in shaping long-run economic performance, while the effects of governance and other macroeconomic variables remain nuanced and context-specific.

4.7 Mean Group Long-Run Findings

Table 4.7 Mean Group Test

Country	EXD	EXR	RIR	COC
Angola	0.0406	-0.0224	0.2420	11.0003
Kenya	-0.0888	0.0500	-0.0239	0.8747
Nigeria	-0.6068	0.0286	0.1523	-3.8820
South Africa	-0.2293	0.2178	-0.2806	1.0390

Source: Author's computation (2026)

The MG results from Table 4.6, based on the Mean Group estimator proposed by Pesaran and Smith (1995), confirm a negative relationship between external debt and economic growth across countries, reinforcing the robustness of the debt-overhang effect. However, the effects of exchange rate and governance vary considerably across countries, reflecting structural differences among Angola, Kenya, Nigeria, and South Africa. This heterogeneity suggests that macroeconomic dynamics are not uniform across these economies and that policy responses should be country-specific

4.8 Discussion

The results indicate a long-run inverse relationship between external debt and economic performance, consistent with the debt-overhang hypothesis. This aligns with empirical evidence reporting a negative impact of external debt on growth in developing and Sub-Saharan African economies (Edo et al., 2020; Turan & Yanıkkaya, 2021). Rising debt levels may increase fiscal pressure, discourage investment, and divert resources from productive expenditure toward debt servicing. The negative and statistically significant error correction term further confirms a stable long-run relationship, with a relatively rapid adjustment toward equilibrium, consistent with dynamic panel evidence (Asteriou et al., 2020).

Governance quality does not exhibit a statistically significant direct effect on economic performance, consistent with studies reporting weak governance–growth relationships in developing economies (Mehmood et al., 2021). This suggests that governance may influence economic performance indirectly or vary across countries with different institutional structures.

Exchange rate movements significantly influence economic performance in the short run, highlighting the importance of macroeconomic stability. This finding aligns with evidence emphasising the role of exchange rate stability in supporting economic performance (Mohsin et al., 2021). Overall, external debt remains the dominant driver of long-run economic performance, while the effects of governance and other macroeconomic variables are more nuanced and context-specific.

5. Conclusion

This study examined the effects of external debt and governance quality on economic performance in selected Sub-Saharan African economies using a panel ARDL framework. The findings confirm the existence of a stable long-run relationship among the variables. The results reveal that external debt exerts a significant negative effect on economic performance in the long run, suggesting that excessive borrowing may constrain growth through increased debt servicing burdens and reduced investment.

In contrast, governance quality and real interest rate do not exhibit statistically significant direct effects, indicating that their influence on economic performance may be indirect or context-specific. Exchange rate movements are found to have a significant short-run impact on growth, highlighting the importance of macroeconomic stability. Overall, the findings suggest that external debt remains a critical determinant of economic performance, while the role of governance and other macroeconomic variables is more nuanced and may vary across countries.

5.1 Policy Recommendations

Based on these findings, several policy recommendations emerge. Firstly, policymakers should prioritize prudent external debt management by ensuring that borrowed funds are directed toward productive investments that enhance growth and improve debt sustainability.

Secondly, while governance quality does not show a statistically significant direct effect in this study, efforts to strengthen institutional frameworks remain important for improving resource allocation efficiency and supporting broader macroeconomic stability.

Thirdly, maintaining exchange rate stability is essential to minimize short-run disruptions to economic activity and support sustained economic performance. All in all, achieving sustainable economic growth in Sub-Saharan Africa requires a balanced approach that combines responsible debt management, macroeconomic stability, and continued institutional development.

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