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Research Article

An Overlap Thesis between Colossal Foreign Debt Burden and Sierra Leone's Economic Growth (1970 to 2024)

Sylvester Bob Hadji[1]*, Mohamed Yayah Ngegla[2], Brima Sesay[3], Abdul Wahab Amara[4]

[1,3]Department of Economics and Commerce, Fourah Bay College-University of Sierra Leone, Freetown, Sierra Leone
[2,4]C/o Department of Economics and Commerce, Fourah Bay College-University of Sierra Leone, Freetown, Sierra Leone

***Corresponding Author:** Sylvester Bob Hadji, Department of Economics and Commerce, Fourah Bay College-University of Sierra Leone, Freetown, Sierra Leone.

Abstract

This study investigates and analyses the overlap thesis between colossal foreign debt burden and Sierra Leone's economic growth for the period covering 1970 to 2024.

Significant macroeconomic variables including foreign debt stock to Gross Domestic Product ratio (FDGDP), foreign debt service to export earnings ratio (FDSEXP), export growth (EXPGR), budget deficit to Gross Domestic Product ratio (BDGDP) and terms of trade (TOT) are specified in the model. The data used in running the regression in this study are secondary and were collected from various sources including the Ministry of Finance (MoF), Central Bank of Sierra Leone (CBSL), Sierra Leone Central Statistics Office (Statistics Sierra Leone), International Financial Statistics (IFS), World Development Indicators and World Debt Tables-Various Issues. The variables were tested for stationarity using unit root tests. The Autoregressive Distributed Lag (ARDL) approach was also employed in this study to ascertain both short run and long run relationships among the variables in the model. Diagnostic tests are variously carried out to appraise the robustness of the estimated growth equation using appropriate econometric criteria.

The study empirically finds an inverse overlap thesis between colossal foreign debt burden and Sierra Leone's economic growth for the period being investigated. This implies that high foreign debt burden is iniquitous to the country's economic growth, in terms of both short run and long run growth trajectory, which corroborates the country's debt "overhang" problem.

The study, therefore, concludes that over the period under investigation, foreign debt burden has adversely affected economic growth in Sierra Leone, and hence proffers strategic recommendations, consistent with the findings obtained.

Keywords: Foreign Debt, Foreign Debt Accumulation, Debt Overhang, Debt Service, Gross Domestic Product.

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Introduction

Foreign debt is appropriately described as money a country obtains from external sources, such as international organisations, foreign governments, or private lenders meant to be repaid with interest.

While borrowing can be a useful tool for financing development projects and stabilising economies, the growing burden of foreign debt has had serious negative effects on many developing countries, including Sierra Leone. This burden has slowed down economic growth,

increased poverty levels, weakened national sovereignty, and caused political and social instability.

One of the major effects of a heavy foreign debt burden is the constraint it places on a country's economy. Developing countries often have to spend a large portion of their national income just to pay back interest on loans, let alone the principal amounts. This limits the amount of money available for essential services like healthcare, education, infrastructure, and social welfare. As a result, instead of using their resources to promote development and improve the living conditions of their citizens, governments are trapped in a cycle of debt servicing.

Additionally, foreign debt contributes to underdevelopment and poverty. Many developing countries borrow with the hope of investing in projects that will boost their economies. However, due to corruption, mismanagement, and sometimes harsh loan conditions, these projects often fail to generate the expected returns. In such cases, the countries are left with even more debt without having improved their economies. This worsens unemployment, reduces incomes, and increases the gap between the rich and the poor.

Another significant effect is the loss of national sovereignty. When a country is heavily indebted, it often has to agree to strict conditions set by lenders, especially international organisations like the International Monetary Fund (IMF) and the World Bank. These conditions, known as "structural adjustment programmes," may include cutting government spending, removing subsidies, and privatising national industries. Although these measures are intended to stabilise economies, they often lead to hardship for ordinary citizens, and the government loses control over its economic policies.

Moreover, a large foreign debt burden can lead to political and social unrest. Citizens often become frustrated when they see their living conditions worsening while their leaders continue to borrow more money. Protests, strikes, and even violent conflicts can arise when people feel that their futures are being mortgaged to foreign interests. In some cases, political instability worsens the economic situation, creating a vicious cycle of poverty, debt, and unrest.

To solve this problem, developing countries must take steps to manage their debts wisely. This includes borrowing only for projects that have clear economic benefits, improving governance to prevent corruption, diversifying their economies to reduce dependence on foreign aid, and seeking debt relief where possible. Creditors, too, have a role to play by offering fair loan terms and supporting sustainable development rather than trapping nations in endless debt.

Problem Statement

Sierra Leone's economy has grappled with persistent challenges of debt accumulation since the 1970s, a period marked by political instability, weak institutional capacity, and dependence on primary commodity exports. Despite successive debt relief initiatives under the Heavily Indebted Poor Countries (HIPC) framework and restructuring agreements with international creditors, the country's foreign debt stock has once again reached unsustainable levels in recent years. This resurgence of debt coincides with sluggish and volatile economic growth, exacerbated by global shocks, domestic fiscal mismanagement, and structural economic weaknesses.

The "overlap thesis" suggests that beyond a certain threshold, the burden of foreign debt does not simply co-exist with economic growth but actively undermines it, as debt servicing obligations divert scarce public resources from productive investment into interest and principal repayments. In Sierra Leone, this dynamic appears particularly acute, given the competing fiscal demands for infrastructure development, healthcare, education, and post-conflict reconstruction. While some scholars argue that moderate debt can stimulate growth through financing of developmental projects, others contend that excessive debt becomes a drag on growth due to crowding out of domestic investment and loss of investor confidence.

From 1970 to 2024, Sierra Leone's economic trajectory presents an opportunity to investigate whether the overlap thesis holds true in the country's context. However, there is limited empirical literature specifically addressing how colossal foreign debt burdens have interacted with Sierra Leone's macroeconomic performance over the long term. Without a clearer understanding of this relationship, policymakers risk repeating cycles of debt accumulation without achieving sustained growth. This gap in knowledge underscores the need for a comprehensive examination of the linkages between foreign debt dynamics and economic growth in Sierra Leone over the past five decades.

Research Objectives

General Objective

The general objective of this study is to examine the relationship between Sierra Leone's colossal foreign debt burden and its economic growth from 1970 to 2024 within the framework of the overlap thesis.

Specific Objectives

The specific objectives of this study are to:

i) analyse the nexus between foreign debt accumulation and economic growth in Sierra Leone between 1970 and 2024.

ii) assess whether Sierra Leone's debt burden has reached levels consistent with the predictions of the overlap thesis.

iii) evaluate the impact of debt servicing on the country's economic growth.

iv) recommend policy options for achieving sustainable economic growth while managing foreign debt prudently.

Specific Research Questions

i) what is the nexus between foreign debt accumulation and economic growth in Sierra Leone between 1970 and 2024?

ii) has Sierra Leone's debt burden reached levels consistent with the predictions of the overlap thesis?

iii) what is the impact of debt servicing on the country's economic growth?

iv) which policy options can be recommended for achieving sustainable economic growth while managing foreign debt prudently?

Literature Review

Theoretical Literature Review

The overlap thesis between foreign debt burden and economic growth focuses on how the two concepts interact over time, especially in developing countries. Several economic theories explain this relationship, particularly highlighting when and how foreign debt can either stimulate or hinder economic growth.

Below are key theories and conceptual frameworks that explain the overlap thesis:

Debt Overhang Theory

Core idea: When a country's debt level is perceived to be unsustainably high, it discourages investment because future returns are expected to go toward repaying creditors rather than benefiting investors.

Overlap thesis: High foreign debt burdens reduce incentives for private and public investment, slowing down economic growth.

Key implication: Beyond a certain threshold, foreign debt becomes a drag on growth rather than a support.

Dual Gap Theory (Two-Gap Model)

Core idea: Developing countries face two main constraints to growth—savings gap (lack of domestic savings) and foreign exchange gap (insufficient foreign currency for imports).

Overlap thesis: Foreign borrowing can fill these gaps and support growth—only if the borrowed funds are used productively.

Key implication: If foreign debt is used inefficiently, it contributes to debt burden without boosting growth.

Solow Growth Model (Extended with Debt)

Core idea: In the standard Solow model, long-run growth depends on technology, capital, and labour. Extensions include the impact of debt.

Overlap thesis: When debt is used to finance capital accumulation, it may enhance growth, but excessive debt increases repayment obligations, reducing savings and investment in the long term.

Key implication: The relationship is non-linear—moderate debt may help growth, excessive debt may harm it.

Liquidity Constraint Theory

Core idea: Countries with limited access to international capital markets may borrow externally to smooth consumption and invest.

Overlap thesis: Foreign debt supports economic activity in the short term, but repayment obligations can later constrain fiscal space and reduce future growth.

Key implication: Growth benefits from foreign debt are temporary unless supported by structural reforms.

Keynesian Perspective

Core idea: Borrowing can be expansionary if it is used for public investment that stimulates demand.

Overlap thesis: Foreign debt may promote short-run growth through increased government spending. However, if debt servicing increases taxes or reduces spending later, it can lead to contraction.

Key implication: Timing and composition of debt-financed expenditures matter.

Endogenous Growth Theory

Core idea: Long-term growth is driven by investment in human capital, innovation, and knowledge.

Overlap thesis: Foreign debt can promote endogenous growth if used to fund education, R&D, and infrastructure. If used for consumption or recurrent spending, it leads to a debt trap.

Key Implication: The productivity of debt-financed spending determines the overlap outcome.

Laffer Curve of Debt

Core idea: There exists a debt threshold—similar to the Laffer curve for taxation—beyond which additional debt leads to lower economic performance.

Overlap thesis: At low levels, foreign debt can promote growth. At high levels, the cost of debt outweighs the benefits.

Key implication: Countries need to identify and manage optimal debt levels.

Empirical literature review

Various empirical studies have been carried out to ascertain the causes of foreign debt and to investigate the effects of foreign debt burden on economic growth in developing countries.

Hadji (2022) investigates the nexus the between foreign debt and economic growth in Sierra Leone. The study focuses on both external and internal factors that are responsible for the foreign debt in Sierra Leone. Data employed in this study are secondary and were collected from various sources. The study also employed the Ordinary Least Square (OLS) technique for the purpose of estimating the relevant parameters of the model. Various diagnostic tests are carried out. The study empirically reveals a negative nexus between foreign debt and economic growth in Sierra Leone for the period under study signifying that debt accumulation impacts adversely on the country's long-run growth trajectory which confirms debt "overhang" problem in Sierra Leone.

Yusuf and Saidatulakmal (2021) investigate the effect of public debt on Nigeria's Economic growth employing time series data from 1980 to 2018. Domestic debt and foreign debt served as measures of public debt. The study adopted the Autoregressive Distributed Lag (ARDL) approach to analyse the data. The study finds that domestic debt adversely and significantly affected the economic growth in Nigeria in the short run but positively impacted the economic growth in the long run. On the contrary, foreign debt adversely impacted the Nigeria's long run growth for the period under investigation. The results also show that debt servicing negatively affected the country's economic growth.

Ehikioya et al. (2020) examine the dynamic relations between foreign debt and economic growth in 43 African countries over the period 2001-2018. This paper used the Johansen Co-integration test and System Generalised Method of Moments to examine the dynamic relations between foreign debt and economic growth. The study used data from World Development Indicator (WDI) as published by the World Bank and the World Economic database as provided by International Monetary Fund (IMF). The study provides an understanding of how the importance of foreign debt could be short-lived due to its misapplication. The result reveals evidence to support a long-run equilibrium relationship between debt and economic growth in Africa. This result demonstrates that beyond a specific capacity, the short-run converges to equilibrium in the long-run and external debt would start to have a deteriorating impact on economic growth in Africa.

Ajayi et al. (2020) study the consequence of government debt on Nigeria's economic growth using time series data between 1998 and 2018. Applying descriptive statistics, unit root test, Johansen co-integration test and vector error correction model, the study finds that external debt has a negative long-run and short-run effect on Nigeria's economic performance while domestic debt exerts positive long-run and short-run impact.

Adesola (2009) examines the effect of foreign debt service payments on Nigeria's economic growth using the Ordinary Least Square multiple regression method for the analysis. The study reveals that debt payments have negative impact on the economic growth of the country.

Elbadawi et al. (1997) investigate the effect of foreign debt on growth for 99 developing countries, employing a quadratic model with fixed and random effect estimations. The authors find that beyond a threshold level of 97%, debt impacted negatively on growth.

Mbire et al. (1997) empirically examine both internal and external factors that influence the Uganda's debt accumulation. The study finds that worsening terms of trade adversely affected the economy showing that the debt crisis in Uganda was largely influenced by external factors.

Methodolody

Model Specification

The model has been empirically specified to investigate the dynamic relationship between economic growth and various factors related to foreign debt. This includes examining the stock of current foreign debt inflow, foreign debt service, export growth, budget deficit, inflation, private investment, public investment, and terms of trade. The relationship is formalised in the following function:

$$GDPGR = f\ (EDGDP, EDSEXP, EXPGR, FDGDP, INF, PRINVGDP, PUINVGDP, TOT) \quad (1)$$

In this equation, **GDPGR** represents the economic growth rate. The variable **FDGDP** indicates the ratio of current foreign debt inflow to GDP, while **FDSEXP** reflects the ratio of foreign debt service payments to export earnings, which illustrates a potential "crowding out" effect on economic growth. The remaining variables are defined consistently with prior analyses.

To further explore the nexus between economic growth and

foreign debt, along with the control variables that might influence this relationship, we can express the model in a logarithmic form as follows:

$$\boldsymbol{lnGDPGR_t = \beta_0 + \beta_1 lnFDGDP_t + \beta_2 lnFDSEXP_t + \beta_3 lnEXPGR_t + \beta_4 lnBDGDP_t + \beta_5 lnINF_t + \beta_6 lnPRINVGDP_t + \beta_7 lnPUINVGDP_t + \beta_8 lnTOT_t + \varepsilon_t} \quad \textbf{(2)}$$

In this equation, **ln** denotes the natural logarithm, which is used to facilitate interpretation of elasticities and to stabilise variance in the data. The coefficients (β_0, β_1,…. β_8) capture the impact of each independent variable on the economic growth rate, while ϵ_t represents the error term.

To analyse both short run and long-run relationships among these variables, equation (2) can be transformed into an Error Correction Model (ECM) within the Autoregressive Distributed Lag (ARDL) framework. This transformation helps to account for the potential non-stationarity of the data while allowing for the integration of both short term dynamics and long term equilibrium relationships among the variables. The resulting model can be represented as follows:

$$\Delta lnGDPGR_t = \boldsymbol{\beta_0} + \sum_{i=1}^{p} \boldsymbol{\beta_1 \Delta lnGDPGR_{t-1}} + \sum_{i=1}^{p} \boldsymbol{\beta_2 \Delta lnFDGDP_{t-1}} + \sum_{i=1}^{p} \boldsymbol{\beta_3 \Delta lnFDSEXP_{t-1}} + \sum_{i=1}^{p} \boldsymbol{\beta_4 \Delta lnEXPGR_{t-1}} + \sum_{i=1}^{p} \boldsymbol{\beta_5 \Delta lnBDGDP_{t-1}} + \sum_{i=1}^{p} \boldsymbol{\beta_6 \Delta lnINF_{t-1}} + \sum_{i=1}^{p} \boldsymbol{\beta_7 \Delta lnPRINVGDP_{t-1}} + \sum_{i=1}^{p} \boldsymbol{\beta_8 \Delta lnPUINVGDP_{t-1}} + \sum_{i=1}^{p} \boldsymbol{\beta_9 \Delta lnTOT_{t-1}} + \boldsymbol{\delta_1 lnGDPGR_{t-1}} + \boldsymbol{\delta_2 lnEDGDP_{t-1}} + \boldsymbol{\delta_3 lnEDSEXP_{t-1}} + \boldsymbol{\delta_4 lnEXPGR_{t-1}} + \boldsymbol{\delta_5 lnFDGDP_{t-1}} + \boldsymbol{\delta_6 lnINF_{t-1}} + \boldsymbol{\delta_7 lnPRINVGDP_{t-1}} + \boldsymbol{\delta_8 lnPUINVGDP_{t-1}} + \boldsymbol{\delta_9 lnTOT_{t-1}} + \boldsymbol{\lambda ECM_{t-1}} + \boldsymbol{\varepsilon_t} \quad (3)$$

From the equation (3), the coefficients δ_1, δ_2, δ_3, δ_4, δ_5, δ_6, δ_7, δ_8, δ_9 represent the long run relationship in the model. To perform the bounds test on the equation (3) given the long run coefficients, the F-statistics will be used to test the following hypothesis:

H_0: $\delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = \delta_8 = \delta_9 = 0$ Null hypothesis of no co- integration against the alternative,

H_1: $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq \delta_7 \neq \delta_8 \neq \delta_9 \neq 0$ existence of a co-integration.

After establishing the existence of a long-run relationship among our variables through the bounds test, we can proceed to estimate both the long run and short run coefficients. This step is essential for understanding how foreign debt and other influencing factors affect economic growth over different time periods.

To facilitate this analysis, we first refer back to equation (1), which outlines the overall relationship we aim to investigate. From this foundation, we can derive a new equation that captures the short run dynamics of the model. This is represented in equation (4), which incorporates lagged terms and adjustment factors to account for immediate effects on economic growth resulting from changes in foreign debt and other variables.

From equation (3), we transition into an Error Correction Model (ECM) framework. The ECM allows us to differentiate between short term fluctuations and long term trends, providing a means to assess how quickly the system adjusts to changes. Specifically, it measures the short run impacts of foreign debt on economic growth while also incorporating the long run equilibrium relationship established earlier.

This approach not only clarifies the immediate effects of various factors but also highlights the adjustment mechanism through which the economy returns to its long term growth trajectory after experiencing shocks. By capturing both the short run and long run coefficients, we gain a comprehensive understanding of the interplay between foreign debt and economic growth, enabling us to make informed policy recommendations based on the results of the analysis.

$$\Delta lnGDPGR_t = \boldsymbol{\alpha_0} + \sum_{i=1}^{m1} \boldsymbol{\partial i \Delta lnGDPGR_{t-1}} + \sum_{i=0}^{m2} \boldsymbol{\delta_i \Delta lnFDGDP_{t-1}} + \sum_{i=0}^{m3} \boldsymbol{\theta_i \Delta lnFDSEXP_{t-1}} + \sum_{i=0}^{m4} \boldsymbol{\tau_i \Delta lnEXPGR_{t-1}} + \sum_{i=0}^{m5} \boldsymbol{\gamma_i \Delta lnBDGDP_{t-1}} + \sum_{i=0}^{m6} \boldsymbol{\phi_i \Delta lnINF_{t-1}} + \sum_{i=0}^{m7} \boldsymbol{\varphi_i \Delta lnPRINVGDP_{t-1}} + \sum_{i=0}^{m8} \boldsymbol{\vartheta_i \Delta lnPUINVGDP_{t-1}}$$

$$m9$$

$$+\sum \psi_i \Delta TOT_{t-1} + \lambda ECM_{t-1} + \varepsilon_t$$

$$i=0 \qquad (4)$$

The equation above represents the short run dynamics of ARDL error correction form. The lags of our explained and explanatory variables are captured.

Equations 3 and 4 provide a robust structure for examining how fluctuations in external debt and related control variables impact economic growth over both short and long run, facilitating a deeper understanding of their interdependencies

Estimation Technique

Pre-estimation

Before estimating the models, the study carried out pre-estimation tests to ensure that the data series were devoid of problems of non-stationarity and multicollinearity. The significance of this obtains from the fact that running a regression with variables that are not stationary or variables that have problem of multicollinearity will yield "spurious" or misleading results. Such results cannot be relied upon to inform policy. In testing for stationarity, the study employed both the Augmented Dickey-Fullah (ADF) and Phillips-Perron (PP) class of tests. Testing for the absence or presence of multicollinearity among the variables was done by adopting a straight forward correlation study.

Estimation

In estimating the models, the study carried out co-integration test using the bounds test of the autoregressive distributed lag (ARDL) approach. Testing for co-integration means testing for long run relationship among the variables in the model. The study carried out both the short run and long run estimations using the ARDL approach to address the objectives of the study.

Post-estimation

After estimating the models, the study also carried out post-estimation tests, otherwise called diagnostic tests, to ascertain the robustness of the models. The following diagnostic tests were conducted:

- Breusch-Pagan-Godfrey serial correlation test: testing for the presence or absence of serial correlation in the residuals.
- Heteroscedasticity test: testing for the presence or absence of heteroscedasticity in the models.
- Jarque-Bera residual distribution test: testing the normality of the residuals.
- Ramsey RESET test: testing whether the models were correctly specified.

Data Collection

Data Type

Secondary data were collected for running the analysis.

Data Sources

The data sets used in the analysis were obtained from various sources: Ministry of Finance, Bank of Sierra Leone, Sierra Leone Central Statistics Office (Statistics Sierra Leone), International Financial Statistics (IFS), World Development Indicators and World Debt Tables-various issues.

Presentation and Analysis of Empirical Results

Descriptive Statistics

The analysis begins with an examination of the descriptive statistics for the variables, as presented in Table 1. The average GDP growth rate is reported to be 3.091, accompanied by a notable standard deviation of 7.041. This substantial standard deviation indicates considerable fluctuations in GDP growth throughout the study period, which spans from 1973 to 2024. The dataset shows a maximum GDP growth rate of 26.30 and a minimum of -19.00, highlighting significant variability. The disparity between the mean, median, minimum, and maximum values suggests that the distribution of GDP growth rates is not symmetric, reflecting the diverse economic conditions experienced over the years analysed.

Further insights can be gleaned from the results of the Jarque-Bera test, which assesses the normality of the residuals for the GDP growth rate and other variables in the dataset. The p-values for the GDP growth rate and nearly all other variables fall below the 5% significance level, leading us to reject the null hypothesis of normal distribution for these residuals. In contrast, the null hypothesis for inflation is not rejected, as its Jarque-Bera probability is above 5%. This indicates that the inflation data may exhibit a normal distribution, providing a stark contrast to the other variables in the analysis.

Examining the inflation data more closely, it is observed to be marginally negatively skewed, although this skewness is not statistically significant, as evidenced by a p-value of 47.76, which exceeds the 0.05 threshold. This suggests that while there may be slight asymmetry in the inflation data, it does not deviate significantly from a normal distribution. The characteristics of each variable will be explored in greater detail in the following sections, starting with a correlation analysis, to further understand the relationships and dynamics present in the dataset.

Table 1. *Descriptive Statistics*

	GDP GR	FDG DP	FDS EXP	EXP GR	BDG DP	INF L	PRINV GDP	PUINV GDP	TOT
Mean	3.09	0.87	1.41	21.1	0.10	13.	0.0639	0.0486	0.7
	13	47	23	97	10	652			117
Median	3.40	0.60	0.55	13.3	0.09	13.	0.0500	0.0400	0.6
	00	50	00	00	00	710			650
Maximum	26.3	2.02	14.2	164.	0.60	19.	0.6000	0.1300	2.0
	00	00	70	30	00	950			000
Minimum	-	0.16	0.03	1.20	0.01	7.2	0.0100	0.0100	0.2
	19.0	00	00	00	00	400			700
	00								
Std.	7.04	0.60	2.37	27.4	0.10	3.3	0.0863	0.0321	0.3e
Dev.	11	85	21	83	41	731			236
Skewness	0.24	0.56	3.79	3.41	3.66	-	5.3704	0.8490	1.5
	80	74	51	85	18	0.02			514
						61			
Kurtosis	6.35	1.85	20.1	17.3	16.9	2.1	33.834	2.8552	6.9
	18	50	59	38	19	235			159
Jarque-Bera	22.0	4.98	674.	483.	474.	1.4	2043.4	5.5669	47.
	05	13	78	62	17	776			843
Probability	0.00	0.08	0.00	0.00	0.00	0.4	0.0000	0.0618	0.0
	00	28	00	00	00	776			000
Sum	142. 20	40.2 40	64.9 70	975. 10	4.65 00	628 .02	2.9400	2.2400	32. 740
Sum Sq. Dev.	223 1.0	16.6 62	253. 22	3399 0.0	0.48 82	512 .03	0.3352	0.0465	4.7 134
Observations	55	55	55	55	55	55	55	55	55

Correlation Results

Before conducting the regression analyses, a preliminary correlation analysis was performed to explore the relationships between economic growth and various explanatory variables. The results, detailed in table 2, reveal a moderate negative correlation between economic growth (GDPGR) and foreign debt (FDGDP), as well as between GDP growth and foreign debt service relative to export earnings. Additionally, the analysis indicates a negative correlation between inflation (INF) & terms of trade (TOT) and economic growth, suggesting that rising inflation and unfavourable trade conditions may hinder economic performance. These findings set the stage for an in-depth understanding of the factors influencing economic growth in Sierra Leone.

Conversely, the analysis highlights moderate positive correlations between export growth, private investment & public investment and economic growth, aligning with theoretical expectations. This indicates that increases in exports and investments are likely to support economic expansion.

Furthermore, the correlation between budget deficits (BDGDP) and both external debt and external debt service is negative, implying that higher budget deficits may exacerbate the challenges posed by foreign debt. These preliminary insights underscore the complex interplay of various economic factors, providing a foundation for the subsequent regression analyses aimed at elucidating the specific relationships between foreign debt and economic growth in Sierra Leone.

Table 2. *Correlation Matrix*

	GDP GR	FDG DP	FDSE XP	EXP GR	BDG DP	INF L	PRINV GDP	PUINV GDP	TOT
GDPG	1.00								
R	00								
EDGDP	-	1.00							
	0.35	00							
	50								

EDSEX	-	0.37	1.000						
P	0.29	27	0						
	95								
EXPGR	0.09	0.04	-	1.00					
	25	28	0.042	00					
			2						
FDGDP	0.22	-	-	-	1.00				
	49	0.24	0.055	0.11	00				
		07	5	54					
INF	-	-	0.107	-	-	1.0			
	0.26	0.11	0	0.37	0.03	000			
	12	06		20	06				
PRINV	0.06	-	-	-	0.02	0.2	1.0000		
GDP	38	0.37	0.211	0.03	47	777			
		05	9	93					
PUINV	0.42	-	-	-	0.13	-	0.1347	1.0000	
GDP	64	0.46	0.316	0.05	57	0.06			
		41	5	92		39			
TOT	-	0.27	-	0.10	-	0.0	-0.0996	-0.5246	1.0
	0.45	98	0.217	05	0.24	686			000
	91		8		21				

Unit Root Test Results

Table 3. *Unit Root Tests*

	Augmented Dickey-Fuller (ADF) Tests					
		Constant and No Trend		Constant and Trend		
Variable	Level/ΔLevel	Test Statistics	ADF critical values (5%)	Test Statistics	ADF critical values (5%)	Conclusion
GDPGR	Level	-5.5106**	-2.9281	-6.1094**	-3.5131	I(0)
FDGDP	Level	-1.7008	-2.9281	-1.7390	-3.5131	I(1)
	ΔLevel	-6.0230**	-2.9297	-5.9338**	-3.5181	
FDSEXP	Level	-4.3373**	-2.9281	-4.2934**	-3.5131	I(0)
EXPGR	Level	-5.4709**	-2.9281	-5.5179**	-3.5131	I(0)
TOT	Level	-2.7261	-2.9281	-3.0274	-3.5131	I(1)
	ΔLevel	-6.7524**	-2.9314	-6.6648**	-3.5181	
INF	Level	-4.0039**	-2.9281	-4.3642**	-3.5131	I(0)
PRINVGDP	Level	-1.3718	-2.9331	-9.6341**	-3.5181	I(0)
	ΔLevel	-7.3622**	-2.9331	-18.1807**	-3.5181	
PUINVGDP	Level	-	-	-3.5954**	-	I(0)
		2.9444**	2.9281		3.5131	
FDGDP	Level	-4.0736**	-2.9281	-4.1889**	-3.5131	I(0)

Phillips-Perron (PP) Tests						
		Constant and No Trend		Constant and Trend		
Variable	Level/ΔLevel	Test Statistics	PP critical values (5%)	Test Statistics	PP critical values (5%)	Conclusion
GDPGR	Level	-5.7921**	-2.9281	-6.1918**	-3.5131	I(0)
EDGDP	Level	-1.6859	-2.9281	-1.6419	-3.5131	I(1)
	ΔLevel	-6.0044**	-2.9297	-9.1114**	-3.5155	
EDSEXP	Level	-4.4334**	-2.9281	-4.3838**	-3.5131	I(0)
EXPGR	Level	-5.3611**	-2.9281	-5.6073**	-3.5131	I(0)
TOT	Level	-2.6485	-2.9281	-2.9930	-3.5131	I(1)
	ΔLevel	-7.7529**	-2.9297	-7.6314**	-3.5155	
INFL	Level	-4.0039**	-2.9281	-4.3533**	-3.5131	I(0)
PRINVGDP	Level	-5.8690**	-2.9281	-5.8914**	-3.5131	I(0)
PUINVGDP	Level	-2.9444**	-2.9281	-3.5954**	-3.5131	I(0)
FDGDP	Level	-3.9931**	-2.9281	-4.0392**	-3.5131	I(0)

The results from the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests indicate that the time series data utilised in this study exhibit varying orders of integration, which is crucial for determining the appropriate econometric model. Specifically, the variables representing GDP growth (GDPGR), foreign debt service to exports (FDSEXP), export growth (EXPGR), inflation (INF), private investment as a percentage of GDP (PRINVGDP), and public investment as a percentage of GDP (PUINVGDP) are integrated of order I(0). This means they are stationary at their levels, indicating that their statistical properties do not change over time. In contrast, the foreign debt-to-GDP ratio (FDGDP) and terms of trade (TOT) are identified as integrated of order I(1), meaning that first differencing is required to achieve stationarity. This distinction is critical, as it allows us to tailor the analysis effectively, ensuring the reliability of the results (Banerjee et al., 1993; Campbell & Perron, 1991).

Given the mixed integration orders of the variables, where some are I(0) and others I(1), employing an Autoregressive Distributed Lag (ARDL) model becomes an appropriate choice for estimating both short-run and long-run relationships. The ARDL approach is particularly beneficial in this context because it can handle a combination of stationary and non-stationary variables without necessitating the transformation of all variables to the same order of integration. This flexibility allows for a more nuanced analysis of the relationships among external debt, economic growth, and other relevant factors. After thorough evaluation, the ARDL model selected for this study is specified as ARDL (1, 1, 0, 0, 0, 0, 1, 0, 1), indicating the lag structure for each variable involved in the model.

To ensure the robustness and validity of the chosen ARDL model, an evaluation was conducted based on several selection criteria, including the Akaike Information Criterion (AIC), sequential modified Likelihood Ratio (LR) test statistic, Final Prediction Error (FPE), and the Schwarz Bayesian Criterion (SBC). This comprehensive assessment is vital for selecting a model that meets the statistical assumptions of Gaussian error terms, thereby avoiding common econometric issues such as non-normality, autocorrelation, and heteroscedasticity (Pesaran et al., 2001). The results of this evaluation, as shown

in Table 4, provide a detailed overview of the model's performance across different specifications, ultimately guiding the analysis toward more reliable conclusions regarding the relationships between external debt and economic growth in Sierra Leone.

Table 4. *Optimal lag selection*

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-31.79330	NA*	0.609556*	2.331046	2.730992*	2.469107*
1	-30.78625	1.438633	0.612090	2.330643*	2.775028	2.484045
2	-30.63740	0.204150	0.646242	2.379280	2.868103	2.548022
3	-30.55267	0.111352	0.685671	2.431581	2.964843	2.615663
4	-30.21012	0.430631	0.717899	2.469150	3.046851	2.668572
5	-29.89202	0.381730	0.753924	2.508115	3.130254	2.722878

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level) FPE: Final prediction error

AIC: Akaike information criterion SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

One of the primary objectives of employing the Autoregressive Distributed Lag (ARDL) model estimation technique is to investigate the presence of a long-run relationship among the variables through the bounds testing approach. This method provides a robust framework for examining co-integration, which is essential for understanding whether the variables in question move together over time. The bounds test specifically assesses whether a long-run equilibrium relationship exists between the variables by analyzing the generated F-statistics in relation to pre-defined critical values. If the F-statistic exceeds the upper critical value, it indicates a long-run relationship, while a value below the lower critical value suggests the absence of such a relationship.

In the context of our ARDL (1, 1, 0, 0, 0, 0, 1, 0, 1) model, the bounds test is applied to evaluate the co-integration among the specified variables. The results from this analysis will provide critical insights into how external debt, economic growth, and other relevant factors are interrelated over the long term. By comparing the calculated F-statistic to the critical values from the relevant statistical tables, we can draw conclusions regarding the long-run dynamics of the model. This examination is crucial, as it not only validates the theoretical framework underpinning the study but also guides policy implications based on the established relationships.

The null hypothesis of our bounds tests posits that there is no long-run relationship among the variables under consideration, which is tested against the alternative hypothesis that such a relationship exists. Based on the bounds test results presented in Table 5, we obtained an F-statistic of 6.560956. When we compare this value to the critical values, it becomes clear that we can reject the null hypothesis, as the F-statistic exceeds the 5% critical

Table 5. *ARDL Bounds Test of Co-integration*

Test Statistic	Value	**K**
F-statistic	6.560956	**8**
Critical Value Bounds		
Significance	**I(0)**	**I(1)**
10%	1.85	2.85
5%	2.11	3.15
2.5%	2.33	3.42
1%	2.62	3.77

Source: Authors's computation.

Note: The results are from the ARDL (1, 1, 0, 0, 0, 0, 1, 0, 1)

value for the upper bound. This finding aligns with the principles outlined by Pesaran et al. (2001), which assert that a significant F-statistic provides strong evidence of a long-run relationship among the variables in the model. Therefore, we conclude that a long-run relationship exists between external debt, economic growth, and other relevant factors, validating the theoretical framework of the study.

Having established the presence of a long run relationship among the variables, we proceed to estimate the long run coefficients, with the results detailed in Table 6. These coefficients offer critical insights into the magnitude and direction of the relationships between the variables. As highlighted by Banerjee et al. (1993), understanding these long run dynamics is essential for policymakers, as it helps identify how changes in external debt or other economic factors could impact economic growth over time. The estimated coefficients will facilitate a more nuanced analysis of the data, providing evidence-based recommendations for sustainable economic policies that can enhance economic growth in Sierra Leone.

Long Run Results

Table 6. *Long Run Coefficient Estimation of ARDL (1, 1, 0, 0, 0, 0, 1, 0, 1)*

Dependent Variable: lnGDPGR				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LnFDGDP	-0.480227	0.118498	-4.052610	0.0001***
LnFDSEXP	-0.506211	0.203131	-2.492038	0.0299**
LnEXPGR	0.101121	0.054915	1.841398	0.0854*
LnBDGDP	-0.109223	0.207726	-0.525803	0.6029
LnINF	-0.808040	0.300133	-2.692272	0.0160**
lnPRINVGDP	0.741774	0.305660	2.426797	0.0215**
lnPUINVGDP	0.258869	0.231580	1.117841	0.2725
LnTOT	-1.107225	0.370132	-2.991436	0.0055***
Constant	-2.192059	0.681185	-3.218007	0.0082***

Source: Authors's computation

Note: *, **, *** means significance at the 10, 5 and 1 percent levels respectively. The results are from the ARDL (1, 1, 0, 0, 0, 0, 1, 0, 1)

The long term relationships among the co-integrated variables are elucidated in Table 6. The results indicate that, in the long run, all variables except for government budget deficit (FDGDP) and public investment (PUINVGDP) are statistically significant. Notably, the coefficient for the foreign debt-to-GDP ratio (EDGDP) is negative (-0.480227), signifying that foreign debt adversely affects Sierra Leone's economic growth in the long term. This finding is statistically significant at the 1% level, leading us to reject the null hypothesis of no long run relationship. Specifically, the coefficient suggests that a 1% increase in the external debt-to-GDP ratio will result in a 48.02% decrease in economic growth. While this result may contradict some expectations, it aligns with the debt-overhang hypothesis, which posits that excessive debt levels can deter private investment and hinder economic growth (Basu, Chakraborty, & Guha, 2021). The continuous rise in foreign debt may create apprehensions among potential investors, who might anticipate a higher tax burden necessary to service this debt.

Furthermore, the variable representing external debt service as a ratio of export earnings (FDSEXP) also shows a negative impact on economic growth, with a coefficient of -0.506211, which is statistically significant at the 5% level. This indicates that a 1% rise in debt service relative to export earnings will lead to a decline in economic growth by approximately 50.62%. This finding corroborates the work of Baker, Nagy & Stewart, (2020), who similarly observed that debt servicing negatively affects economic growth. The implication of this result is critical: as debt service obligations rise, the funds available for investment and consumption diminish, thereby stunting economic growth. This underscores the need for effective debt management strategies that prioritize sustainable levels of external debt.

In contrast, the analysis reveals a positive relationship between export growth (EXPGR) and economic growth, with a coefficient of 0.101121. This relationship aligns with theoretical expectations, indicating that an increase in exports will precipitate a long term improvement in economic growth. Specifically, the results suggest that a 1% increase in exports will lead to a 10.11% rise in economic growth. This finding emphasizes the importance of export promotion as a viable strategy for enhancing economic performance in Sierra Leone. By fostering export-led growth, the government can create an environment that attracts investment, increases production, and ultimately stimulates overall economic development.

Additionally, our analysis reveals a long-run negative relationship between government budget deficit (BDGDP)

and economic growth, as indicated by a negative coefficient of -0.109223. This suggests that a 1% increase in the budget deficit could lead to a 10.92% decline in economic growth. However, the p-value indicates that this result is not statistically significant at the 5% level. Therefore, we do not reject the null hypothesis, concluding that budget deficits do not significantly impact economic growth in the long run. This finding may reflect the complexities of budgetary dynamics in Sierra Leone, where the impacts of deficits may be absorbed by other factors or mitigated through counterbalancing fiscal policies.

In terms of inflation (INF), the results show a negative coefficient of - 0.808040, indicating that a 1% increase in inflation will result in an 80.8% reduction in economic growth. This coefficient is statistically significant at the 5% level, underscoring the detrimental effects of high inflation rates on economic growth in Sierra Leone. The findings highlight the urgent need for effective monetary policies aimed at controlling inflation, as persistent inflation undermines consumer purchasing power and stifles economic activity. By maintaining price stability, the government can create a conducive environment for growth, fostering confidence among investors and consumers alike.

Moreover, private investment (PRINVGDP) is shown to have a positive long- run relationship with economic growth, as evidenced by a coefficient of 0.741774. This indicates that a 1% increase in private investment will lead to a 74.18% increase in economic growth, with significance at the 5% level. The positive correlation suggests that enhancing the investment climate—through reforms that reduce bureaucratic barriers and improve access to finance—could significantly bolster economic growth. In addition, public investment (PUINVGDP) displays a positive effect on economic growth, with a coefficient of 0.258869, suggesting that a 1% increase in public investment would lead to a 25.89% increase in economic growth. However, since this finding is not statistically significant, we retain the null hypothesis regarding the impact of public investment on economic growth.

Finally, the coefficient for terms of trade (TOT) is negative (-1.107225) and significant at the 1% level, indicating that a 1% deterioration in the terms of trade will reduce economic growth in Sierra Leone by approximately 10.72%. This finding aligns with previous studies by Reinhart & Rogoff, (2010)., which noted that worsening terms of trade adversely affect economic growth. In a context where Sierra Leone is heavily reliant on exports of primary commodities, fluctuating terms of trade can have pronounced effects on economic stability. Overall, these insights are vital as they inform policy decisions aimed at enhancing economic resilience and fostering sustainable growth in Sierra Leone.To further investigate the short run impacts of our explanatory variables, we utilised the ARDL Vector Error Correction Model (VECM) approach, with the results presented in Table 7. This analysis will allow us explore the immediate effects of changes in the explanatory variables on economic growth, providing a comprehensive understanding of the dynamics at play in the Sierra Leonean economy.

Short Run Results

Table 7. *ARDL Short Run Estimation*

Dependent Variable: Δln GDPGR				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Constant	5.563817	2.159605	2.576312	0.0109**
Δln(GDPGR(-1))	0.334679	0.138294	2.420054	0.0166**
Δln(FDGDP)	-0.836040	0.073708	-11.34264	0.0000***
Δln(FDSEXP)	-0.200059	0.108192	-1.849118	0.0737*
Δln(EXPGR)	0.252296	0.134030	1.882388	0.0689*
Δln(BDGDP)	-0.236183	0.097367	-2.425696	0.0163**
Δln(INF)	-0.757888	0.155021	-4.888924	0.0000***
Δln(PRINVGDP)	0.793486	0.323336	2.454056	0.0245**

Source: Authors's computation

Note: *, **, *** means significance at the 10, 5 and 1 percent levels respectively. The results are from the ARDL (1, 1, 0, 0, 0, 0, 1, 0, 1) model 1

The results from Table 7 highlight that previous economic growth has a significant positive impact on current economic growth. Specifically, the coefficient for the previous period's economic growth is 0.334679, which is statistically significant at the 5% level. This finding indicates that a 1% increase in economic growth in the previous period leads to a 33.45% increase in current economic growth. Such a dynamic illustrates the persistence of growth rates, where

past performance can positively influence future outcomes (Bénassy- Quéré et al., 2010). This concept is supported by the idea that economic growth is often self-reinforcing, as higher growth rates can lead to increased investment, improved consumer confidence, and enhanced productivity (Easterly & Levine, 2001). Understanding this persistence is crucial for policymakers aiming to create sustainable growth trajectories.

In contrast, the results reveal that foreign debt (FDGDP) significantly detracts from economic growth in the short run. With a coefficient of -0.836, the findings suggest that a 1% increase in external debt will lead to an 83.6% decrease in economic growth. This finding is particularly alarming and aligns with the debt-overhang hypothesis, which posits that excessive debt can deter investment and economic activity (Krugman, 1989). High levels of debt can create uncertainty among investors, resulting in lower capital inflows and stunted economic performance (Baker et al., 2020). This underlines the critical need for effective debt management strategies that aim to maintain sustainable levels of external debt to foster economic stability and growth.

Moreover, the analysis indicates that foreign debt service as a ratio of export earnings (FDSEXP) has a similarly negative and statistically significant effect on economic growth. A 1% increase in debt service obligations corresponds to a 20% decrease in economic growth. This finding emphasizes the financial burden that debt servicing imposes on economies, particularly those heavily reliant on export revenues (Metwally & Tamaschke, 1994). As debt service consumes a significant portion of national resources, it can limit investments in essential sectors like infrastructure and education, thereby hampering long-term growth prospects (Basu et al., 2021). This highlights the importance of policies that can mitigate the adverse effects of debt servicing on economic performance.

On a positive note, export growth (EXPGR) demonstrates a strong and statistically significant positive relationship with economic growth in the short run, with a coefficient of 0.252296. This indicates that a 1% increase in export growth leads to a 25.22% increase in economic growth. This result underscores the critical role of exports in driving economic development, supporting the notion that countries that enhance their export capacity often experience improved economic outcomes (Rodrik, 2008). Increasing export competitiveness not only boosts economic growth but also helps diversify the economy, making it less vulnerable to external shocks (Brenton & Newfarmer, 2007)

However, the results also reveal a negative short-run relationship between government budget deficit (BDGDP) and economic growth, with a coefficient of -0.2362. A 1% increase in the budget deficit leads to a 23.62% decrease in economic growth, and this relationship is statistically significant at the 5% level. Such findings are consistent with previous research indicating that large fiscal deficits can crowd out private investment and lead to higher interest rates, which ultimately stifles economic growth (Cebula, 2012; Reinhart & Rogoff, 2010). Therefore, addressing fiscal imbalances is crucial for ensuring a conducive environment for growth in Sierra Leone.

Inflation (INF) is also shown to have a negative short-run relationship with economic growth, confirming the long-run analysis. The results indicate that a 1% increase in inflation corresponds to a 75.79% decrease in economic growth, with the coefficient being statistically significant at the 1% level. This finding reaffirms the detrimental impact of high inflation rates on economic performance, highlighting the need for effective monetary policy interventions to maintain price stability (Fischer, 1993; Ghosh & Phillips, 1998). Persistent inflation can erode purchasing power and destabilize economic conditions, thus hindering growth prospects.

Private investment (PRINVGDP) emerges as a significant driver of economic growth, exhibiting a positive short-run relationship with a coefficient of 0.7935. This suggests that a 1% increase in private investment results in a 79.35% increase in economic growth, with statistical significance at the 5% level. This finding aligns with the literature emphasizing the importance of private sector investment as a catalyst for economic development (Cohen & Levinthal, 1990). Creating a favorable environment for private investment, such as improving infrastructure and reducing regulatory barriers, is essential for enhancing economic performance.

Public investment (PUINVGDP) also shows a positive effect on economic growth in the short run, with a coefficient of 0.2153. This implies that a 1% increase in public investment leads to a 21.53% increase in economic growth. However, the p-value indicates that this result lacks statistical significance, leading us to retain the null hypothesis that public investment does not significantly affect economic growth in the short run. Similarly, the terms of trade (TOT) demonstrate a positive but statistically insignificant effect on economic growth, with a coefficient of 0.0162. These findings suggest that while public investment and terms of trade may influence economic growth, their effects are less pronounced in the short run.

In light of the established long-run relationships among the variables, we turn to the error correction term (ECT), which assesses the speed at which variables return to long-run equilibrium after a shock. The ECT is derived from the ARDL model and reflects the co-integration and

long-run coefficients. A negative ECT signifies a rapid return to equilibrium, whereas a positive ECT suggests a slow convergence. In this analysis, the ECT coefficient is -0.575818, with a significant p-value. This indicates a co-integrating relationship among the variables, demonstrating that approximately 57% of the adjustment to long- run equilibrium occurs in the first period following a shock. Such rapid recovery highlights the importance of robust economic policies that can effectively respond to disturbances and sustain long-term growth trajectories.

Table 8 presents the results of the diagnostic tests conducted on the estimated ARDL model. The purpose of these tests is to assess the robustness and validity of the model, ensuring that it adheres to the underlying assumptions required for reliable inference. The first test, the Breusch-Godfrey serial correlation test, evaluates the presence of serial correlation in the model's residuals. At a 5% significance level, the null hypothesis, which posits that there is no serial correlation, cannot be rejected, as the p-value (0.1520) exceeds the significance threshold of 0.05. This finding suggests that the residuals are independently distributed, indicating a well-specified model.

Next, the Breusch-Pagan-Godfrey test is conducted to examine the presence of heteroscedasticity in the model. Again, at a 5% significance level, the null hypothesis stating that there is no heteroscedasticity cannot be rejected, with a p-value of 0.1644. This result implies that the variance of the residuals is constant across observations, reinforcing the model's appropriateness. Additionally, the Ramsey-RESET test, which checks for specification errors, yields a result consistent with the previous tests. The null hypothesis, which asserts that there are no specification errors in the model, is not rejected at the 5% level, confirming the model's robustness and proper functional form.

Furthermore, the Jarque-Bera test is employed to assess the normality of the residual distribution. The results show that at the 5% significance level, the null hypothesis indicating that the residuals are normally distributed cannot be rejected, with a p-value of 0.444303. This finding is critical because normally distributed residuals are an essential assumption for valid hypothesis testing and confidence interval estimation in regression analysis.

To further ensure the stability of the estimated parameters in the model, the CUSUM and CUSUMQ tests are utilized. The stability of the parameters is illustrated through the plotted graphs, where the straight lines represent the estimated parameter values, while the dashed lines indicate the 95% confidence intervals. These graphical representations, shown in Figures 5.1 and 5.2, allow for a visual assessment of parameter stability over time. The absence of significant deviations from the confidence bands suggests that the model parameters remain stable, reinforcing the reliability of the ARDL (1, 1, 0, 0, 0,

0, 1, 0, 1) estimates.

Overall, the diagnostic tests provide strong evidence that the ARDL model is well-specified, free from serial correlation and heteroscedasticity, and that the residuals are normally distributed. These results lend credence to the validity of the model's findings, making it a robust tool for analysing the relationships among the variables of interest.

In our analysis of the ARDL model, we utilized the CUSUM and CUSUMQ tests to assess the stability of the estimated parameters in both the short run and long run. The results, displayed in Figures 1 and 2, provide a comprehensive visual representation of the parameter stability over time. These graphs plot the cumulative sum of the residuals and their squares, allowing for a clear assessment of whether the estimated coefficients remain consistent throughout the sample period. Notably, both figures reveal no significant deviations from the established 5% significance thresholds, indicating that the model does not exhibit any structural breaks.

Consequently, we can confidently assert that our model is stable, and the estimated results are both reliable and valid. The absence of structural breaks enhances the credibility of our findings, suggesting that the relationships identified between the variables remain robust over time. This stability is crucial for drawing meaningful conclusions

Table 8. *Diagnostic Tests*

Diagnostic Tests	Statistic	p-value
Breusch-Godfrey Serial Correlation LM Test	2.164679 (F-stat.)	0.1520
Heteroscedasticity Test: Breusch-Pagan-Godfrey	2.039076 (F-stat.)	0.1644
Heteroscedasticity Test: ARCH	0.125827 (F- stat.)	0.7248
Ramsey RESET Test	0.508623 (F- stat.)	0.4814
Normality Test (Jarque-Bera)	1.622499 (JB- stat.)	0.4443

from the model, as it implies that the underlying dynamics governing the relationships are consistent and not subject to sudden shifts. Therefore, the CUSUM and CUSUMQ tests provide strong support for the reliability of our ARDL model's estimates.

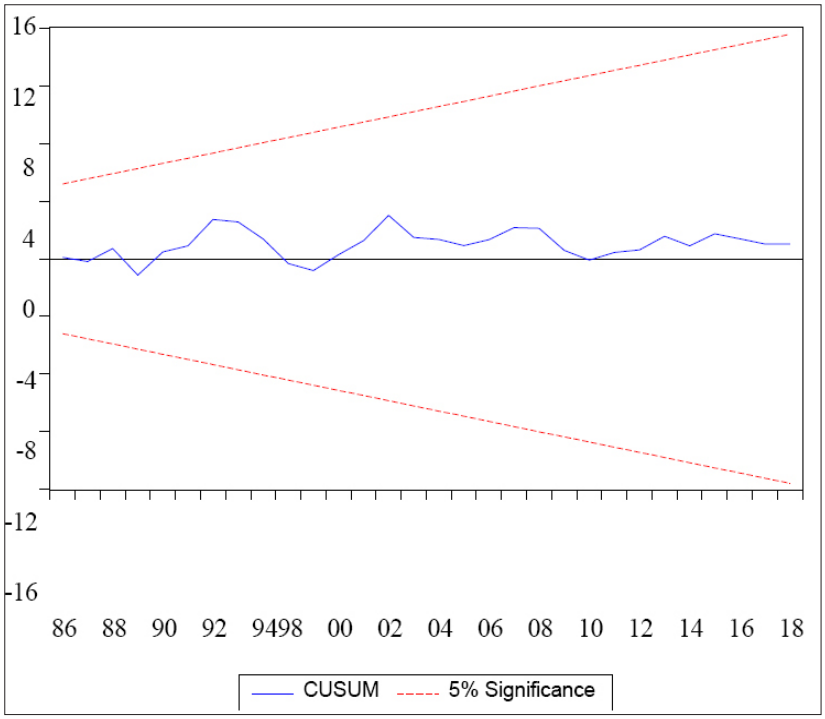

Figure 1 *CUSUM test.*

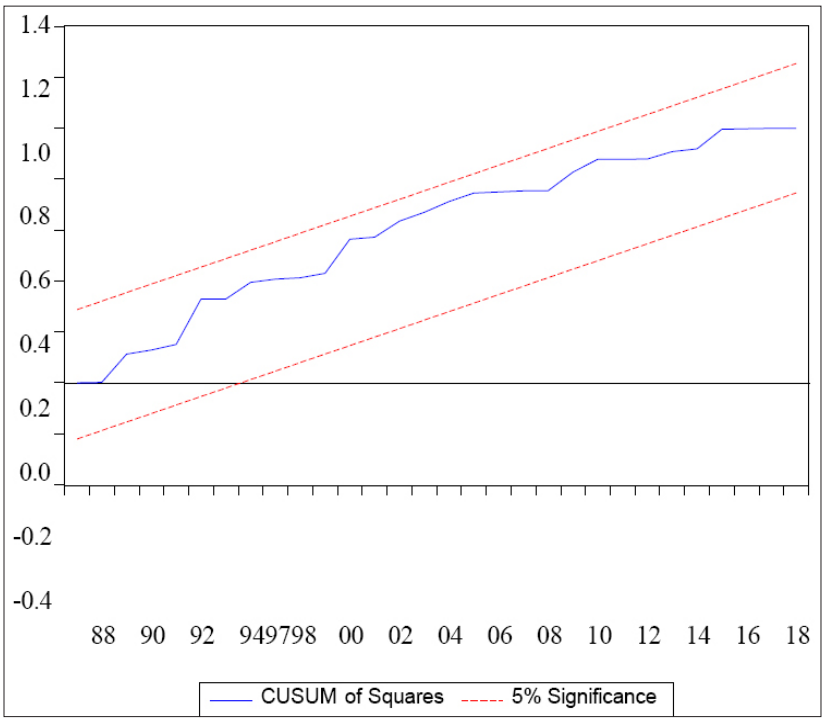

Figure 2. *CUSUM of Squares test.*

Summary of Main Findings

This research has attempted to contribute to the discourse on resolving Sierra Leone's foreign debt challenges in an effort to attain sustainable economic growth and development in the country. It is worth noting that colossal foreign debt stocks have persisted in the country owing to a range of reported factors, including continued GDP growth rate fluctuation, low export growth, low private sector investment, imprudent projects management, endemic corruption, and recurring dreadful diseases, among others, regardless of the fact that the country is endowed with abundant natural resources,

The empirical results from the ARDL model reveal that foreign debt burden has an adverse effect on Sierra Leone's economic growth both in the short run and in the long run. This finding is consistent with the studies

by Maxwell et al. (2021), Bangura (2020), Favour et al. (2019) and Cunningham (1993). This points to the creation of disincentive for and crowding out of private investment thereby dampening economic growth; coupled with effects of draining scarce resources to service debt as well as poor development projects.

The study, therefore, concludes that foreign debt burden impacts Sierra Leone's economic growth negatively for the period under investigation.

Policy Recommendations

Consistent with the findings, the study has provided key recommendations necessary for prudent foreign debt management geared towards attaining economic growth and sustainable development in Sierra Leone. Such recommendations are:

Review of foreign debt management strategies: There is a strong need to review the country's foreign debt management strategies by ensuring that foreign debt is primarily meant for key infrastructure developments including roads, energy and water supply in the bid to promote private sector investment which will consequently lead to economic growth.

Continued political stability: Political stability is a major factor that induces investment generally. The government, therefore, needs to maintain political stability in the country as a way of attracting both domestic and foreign investors. An increase in private sector investment is expected to boost economic growth.

Eradication or minimisation of corruption: Corruption is considered one of the major internal causes of debt problem in Sierra Leone. Against this backdrop, corruption must be eradicated or minimised via continued effort by the government. There should be accountability, good governance and transparency in all sectors of the country. The Anti-Corruption Commission (ACC) should ensure that those found wanting, irrespective of position or status, are brought to book.

Prudent and efficient project management: Essential projects need to be prudently and efficiently managed. This requires proper implementation and regular monitoring and evaluation. Government should, therefore, direct borrowed funds towards such projects. When such projects boom, they contribute to the growth of the country's Gross Domestic Product (GDP) which will help reduce the need for foreign borrowing.

Implementation of strong agricultural policies with special emphasis on domestic rice production: The government should implement strong agricultural policies which will increase the country's capacity to produce essential commodities such as rice (the country's staple food) in substituting for their importation. If this is done, foreign borrowing to import these commodities will be reduced and this will increase the country's fiscal space.

Extraction of crude oil: High oil price is considered one of the main causes of debt problem in Sierra Leone hence its balance of payments problem. But the country has been discovered to have deposits of crude oil. It is, therefore, recommended that the government undertakes oil-extraction programme so that oil bottlenecks on the balance of payments will be eliminated.

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