



ESTIMATING THE EFFECT OF TAXATION ON THE ECONOMIC GROWTH OF SIERRA LEONE USING A TIME SERIES ANALYSIS

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Abstract:

This study delves into the impact of taxation on the economic growth of Sierra Leone, aiming to establish a comprehensive understanding of the intricate relationship between taxation and the country's economic trajectory. Employing time series data spanning from 1995 to 2022, the study utilizes the Auto Regressive Distributed Lag (ARDL) framework for analysis. Unit root analysis reveals that certain variables remain stable at levels, while others achieve stability at their first difference. The bound test cointegration results affirm the presence of cointegration, indicating a long-term relationship between taxation and economic growth in Sierra Leone. The study highlights the overall significance of explanatory variables in explaining Gross Domestic Product (GDP). The coefficient of determination indicates that 77.37 percent of GDP variation is explained by indirect taxes, other taxes, interest rates, and foreign direct investment. Notably, the coefficient of indirect taxes demonstrates a negative and statistically significant influence on short-term economic growth in Sierra Leone. In contrast, interest rates exhibit positive and individually significant effects on short-term economic growth. The findings suggest that indirect taxes in Sierra Leone stimulate consumption but reduce savings. Consequently, policymakers are urged to prioritize enhancing international relations to attract Foreign Direct Investment (FDI) and promote export activities, thereby bolstering export revenue and fostering economic growth.

JEL: O11, O23, H20, H22, C22, F21, E62

Keywords: taxation, economic growth, time series analysis, Sierra Leone

1. Introduction

National governments, globally, face the perpetual challenge of enhancing the welfare of their citizens through judicious economic policies. This involves providing public goods

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and services to establish a robust economic and social infrastructure. Such infrastructure forms the foundation for a country's economic growth and development. Public expenditure, primarily funded through taxation, plays a pivotal role in shaping economic environments for investments, trade, tourism, agriculture, and industrial production. Effective fiscal policies, including a tax structure that maximizes positive externalities and minimizes negative externalities, contribute to citizens' welfare.

Building on Musgrave's law, this study explores the positive correlation between national income growth and government tax revenue. While empirical findings in development economics suggest that a country's tax base grows with its economic growth, variations in growth rates and tax capacity exist due to internal and external economic shocks. The focus on taxation by governments is justified by its role in nation-building. However, the impact of taxation on economic growth and the relationship between tax rates and economic growth remain crucial issues for policymakers.

In Sierra Leone, adjustments to the tax structure have been ongoing, prompted by insufficient revenue generation and resulting in skewed income distribution. This study seeks to determine the impact of taxation on Sierra Leone's economic growth and its influence on fiscal policy tools to spur economic growth. The study aims to establish the connection between indirect and direct taxes on economic growth, proposing an optimal model/structure for Sierra Leone. Additionally, the study contributes to existing literature in this area, with the general objective of establishing the relationship between taxation and Sierra Leone's economic growth. Specific objectives include identifying the impact of taxes on economic growth, examining the relationship between taxation and the lives of ordinary people, and suggesting policy recommendations on tax.

2. Literature Review

2.1 Theoretical Literature Review

2.1.1 Classical Growth Theory

This theory was advanced by political economists Adam Smith, David Ricardo, and Robator Malthus. Smith (1776) premised the four general canons of taxation. Firstly, the principle of equity which means that the subjects of every nation should contribute towards government support in proportion to the protection they enjoy from the state. Secondly, the principle of certainty advocates that everyone is bound to a certain tax with clear timelines, payment manner, and the quantity to be paid. Thirdly, the principle of convenience is that every tax levied at a given time and manner should be convenient to the taxpayer. Lastly, the principle of economics is that every tax regime should ensure that the taxpayer is left with some money once the tax is paid to the state. Some of the classical theories include the Ability to Pay Theory and the Benefits Received Theory.

Regarding the latter theory, taxes are imposed on the ability of taxpayers to make the payment. The ability to pay principle means that there is equal sacrifice for all the subjects of the state who are taxpayers. This involves the one with heavy shoulders being taxed more heavily than the poor and also losing a greater absolute amount of utility.

This is the most progressive tax system leading to a complete egalitarian distribution of after-tax income. Variables such as assets, incomes, and expenditure levels are considered as the best indicators of ability to pay. With regards to the benefits received theory, the state should levy taxes on taxpayers according to the benefits they receive from it. That is, the more the benefits a taxpayer receives from the activities of the government, the more the person should pay taxes to the government.

2.1.2 Keynesian Theory

According to the standard Keynesian hypothesis, fiscal policies disturb private consumption and savings via disposable income and rate of return. Accordingly, a tax reduction would boost private consumption by raising disposable income. However, a temporary tax cut would have minimal effects on private consumption as per the permanent income hypothesis. In the Ricardian equivalence hypothesis tax reductions would not affect at all on consumption since, in expectation of a tax increase in the future, the consumers would save rather than spend.

Increased government spending financed through higher taxes may fuel inflationary forces, which negatively affect capital accumulation. This is because it is associated with greater uncertainty about the returns on current savings as well as those future relative prices that are important for returns on investment. High rates of inflation lead to highly negative real interest rates for savers, which by reducing the flow of savings, constrain investment. However, by virtue of the Tobin-Mundell effect, high-anticipated inflation leads to a shift in portfolio away from real money balances and towards real capital hence encouraging investment and consequently economic growth.

2.2 Empirical Literature Review

Lee & Gordon (2005) while studying the impact of corporate taxes on the growth of an economy, and by use of cross-country data in the U.S ranging for the period 1970 to 1997 to explore the impact of tax policies on a country's economic growth revealed that increases in corporate taxes harm economic growth. Such an outcome in economic growth can be attributed to the fact that increased corporate taxes tend to discourage investment and also impact the income of already established businesses, thus sabotaging possible advancement in economic growth. A similar outcome of this research was later reached by Djankov et al., (2008) who established that corporate taxes negatively impacted aggregate investment as well as economic growth.

Gupta (2007) studied the causes of tax revenue efforts in developing countries by use of a panel data set that covered 105 developing countries for a period of over 25 years. The results of the study confirmed that structural factors such as GDP, agriculture share in GDP; net exports over imports, and foreign aid significantly affect the economy's revenue performance. The conclusion was that countries that relied on taxation of goods and services as their main source of tax revenue had relatively poor tax yield performance. On the other hand, countries that relied more on direct taxes such as income taxes, Capital Gains Tax (CGT), and profit taxes performed much better.

Ahmed & Mohammed (2010) using panel data collected for 11 years from 1998 to 2008 from 25 developing countries studied determinants of tax buoyancy in developing countries. They applied PLSM and found out that the budget deficit in governments of developing economies increased their fiscal efforts to decrease their budget deficit by direct tax thus a significant determinant of tax buoyancy. Other determinants of tax buoyancy were financial reforms, better tax administration, active banking and financial sector, and growth in import and manufacturing sectors.

Mutisya (2014) studied the effect of CGT on total revenue. The findings of the study reviewed the existence of a short and long-run relationship between capital gain taxes to the total tax revenue in Kenya for the period reviewed. A negative, though insignificant relationship exists between total tax revenue and CGT, implying that the introduction of CGT would lead to a decrease in total tax revenue, though insignificantly.

Abdullah et al., (2014), investigated the causal relationship between ecological assessments and monetary development, utilizing distinctive measures of natural charges with GDP and balanced net investment funds. A board of European nations and a different board of OECD nations were utilized from 1995 to 2006 and the standard Granger non-causality approach was connected. The outcomes propose some confirmation of long-run causality running from monetary development to expanded income from the natural duties, with additionally some proof of short-run causality in the invert bearing.

Focusing on individual tax on economic growth, (Gale & Andrew, 2016) reviewed how changes to the individual pay taxes influence long-haul economic development in United States (US). The outcomes propose that not all assessment changes will have a similar effect on development. Changes that enhance impetuses, diminish existing sponsorships, stay away from fortune picks up, and maintain a strategic distance from shortfall financing will have more propitious impacts on the long-haul size of the economy, yet may likewise make exchange-offs amongst value and productivity.

Abala (2014) studied the determinants of economic growth in Sierra Leone using a time series methodology. The study findings showed that FDI and interest rates are important determinants of economic growth in Sierra Leone.

James L. S, Emmanuel Jam & Alpha Kanu (2023) study the analysis of tax buoyancy and its determinants in Sierra Leone using the OLS and time series data. The study employed an ARDL model of estimating the model for the study period of 1998 to 2020. The result revealed that VAT and direct tax have an inverse relationship with the economic growth in Sierra Leone.

3. Methodology

3.1 Empirical Model Specification

This study applied the analytical framework as conceptualized by Egen and Skinner (1996) and consequently specified in both the modified versions of the Lee Young (2004) and Ogbonna & Appah (2012). The cointegration diagnostic testing is based on Johansen

Cointegration test approach to the analysis of long-run relationships. The model has used the modified version of Ogbonna & Appah (2012) to determine the relationship between economic growth and taxation in Sierra Leone.

The relationship between economic growth and taxation can be specified as;

$$\text{GDP} = f(\text{it}, \text{dt}, \text{ot}) \quad (1)$$

In addition to the taxation variables, an attempt was made to control interest rates, foreign direct investment (FDI), and net exports which determine a country's growth rate yet are not really connected to the composition of tax revenue.

The relationship between economic growth, taxation, and other control variables then becomes;

$$\text{GDP} = f(\text{it}, \text{dt}, \text{ot}, \text{ir}, \text{fdi}, \text{nx}) \quad (2)$$

Where:

GDP = is the real gross domestic product which measures economic growth,

dt = direct taxes (being made up of VAT, customs import duties, and excise duties),

ot = other taxes,

ir = interest rate,

fdi = foreign direct investment inflows.

The empirical analysis used annual time-series data on taxes, control variables, and economic growth for the period 1993 to 2022. The specific econometric model becomes.

$$\text{GDP} = a + b_1\text{IT} + b_2\text{DT} + b_3\text{OT} + b_4\text{IR} + b_5\text{FDI} + e \quad (3)$$

Where:

GDP is gross domestic product, a is the constant term,

IT is indirect taxes,

DT is direct taxes,

OT is other taxes,

IR is interest rates,

FDI is foreign direct investment,

b1-5 are the relevant coefficients for the relevant variables and e represents the random error term.

Since the study used time series data in analysis, it was important to undertake various tests to avoid spurious or nonsensical modeling.

The tests carried out included the ADF test, autocorrelation, cointegration, Breusch-Godfrey test, and heteroscedasticity.

3.2 Pre-estimation Tests

Several tests were conducted to give the model the proper functional and mathematical form. The first phase was to undertake a diagnostic test on each of the relevant variables in the determination of its stationarity. The ADF test for unit root was utilized. A correlation analysis was also undertaken to ascertain the relationship between the regressand and the regressors. Further, a normality test was carried out to check whether the data follows a normal distribution and to ensure the normality of the residuals.

By establishing and analysing the long-run relationship between the determinants of tax and economic growth (GDP) as well as the dynamic interactions among the other variables of interest empirically, the Autoregressive Distributed Lags (ARDL) cointegration procedure developed by Pesaran (2001) is used.

The ARDL model for the long-run of BTTR (GDP) of Sierra Leone can thus be specified as:

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta GDP_{t-1} + \sum_{i=1}^n \alpha_{2i} \Delta IT + \sum_{i=1}^n \alpha_{4i} \Delta OT + \sum_{i=1}^n \alpha_{5i} \Delta IR + \sum_{i=1}^n \alpha_{6i} \Delta FDI + \varepsilon_t \quad (4)$$

The essence of using the ARDL is to estimate the model centred on the following purposes: the Autoregressive Distributed Lags cointegration procedure is comparatively more effective even in small sample data as in the case of this study. The ARDL enables the cointegration to be estimated by using the Ordinary Least Square (OLS) techniques since the lags of the models are known. Actually, this will not be in the case of other multivariate cointegration procedures such as the Johansen cointegration Test. Actually, this makes the ARDL procedure relatively easier. Because it does not demand pretesting of the variables included in the model for unit root compared with other methods like in the case of the Johansen approach.

4. Empirical Results and Discussions

4.1 Introduction

This chapter presents an analysis of the data. The chapter presents descriptive statistics of the data, diagnostics tests, and reports on the regression results.

4.2 Descriptive Statistics

Descriptive statistics of the data series are shown in Table 4.1. Descriptive statistics of GDP, interest rate, taxes, FDI, and others. The distribution of the series can be determined by evaluating various statistical measures as indicated in Table 4.1.

The total observations considered in this study were 40 with five variables (one dependent and four independent variables). The range is obtained from the difference between the maximum value and the minimum value. For example, the maximum value of GDP is 26.41732, while the minimum is -20.59877.

The standard deviation indicates the spread of the values from the mean and is of great importance for evaluation purposes. For example, the data indicates that interest

rate has a larger spread as compared to other variables. GDP has a standard deviation of 9.497884, an interest rate of 12.52655, direct tax has 3.207095, FDI has 0.232720, and others tax has 0.104954.

Table 4.1: Descriptive Statistics Result

Sample: 1990-2018					
	GDP_GROWT	IRD	TAXES	FDI	OTHERS
Mean	3.001304	13.70819	8.567310	0.149766	0.087802
Median	4.192610	9.722500	8.234108	0.053095	0.054374
Maximum	26.41732	54.66667	17.39048	0.950478	0.346678
Minimum	-20.59877	4.485833	3.643427	-0.007463	0.000000
Std. Dev.	9.497884	12.52655	3.207095	0.232720	0.104954
Skewness	-0.260054	2.322716	1.165380	2.051917	1.727363
Kurtosis	4.539919	7.124492	4.218519	6.793920	4.606885
Jarque-Bera	3.192253	46.63138	8.358321	37.74263	17.54163
Probability	0.202680	0.000000	0.015311	0.000000	0.000155
Sum	87.03781	397.5374	248.4520	4.343206	2.546272
Sum Sq. Dev.	2525.874	4393.606	287.9929	1.516442	0.308428

Source: Authors' computation (EViews 12).

4.3 Unit Root Tests Results

Although the bound test (ARDL) approach to cointegration does not require the pretesting of the variables of unit root, it is very much essential to conduct this test, to confirm that the variables are not integrated of an order greater than one. The main essence is to verify the absence of I (2) variables to free the results from spurious regression. By establishing the stationarity of the various, the study conducts a unit root test in order to ascertain whether the variables are stationary in level or non-stationary, before applying the Autoregressive Distributed Lags approach to cointegration. The Augmented Dickey-Fuller and Philips Perron tests were applied to all the variables in order to establish their order of integration.

Table 4.2: Unit Root Test Results

Variables	Lag	ADF test statistic (Intercept with no trend)		PP test statistic (Intercept with no trend)		Conclusion
		Level	1 st Difference	Level	1 st Difference	
GDP_growth	1	-4.586246***	-	-4.584966***	-	I ₁
FDI	1	-2.016627	-5.905177***	-2.069673	-5.366752***	I ₁
IRD	1	-4.007968	-	-3.554797**	-	I ₁
Taxes	1	-1.426065	-5.811204***	-1.526986	-7.574015	I ₁
Other Taxes	1	-2.175082	-3.850653***	-1.909874	-3.841612***	I ₁
WAR						
EBOLA						

Note: ***, ** (*) denotes significance at 1%, 5% and 10% respectively.

Source: Authors' computation (EViews 12).

From the unit root test result in Table 4.2, it is clearly shown that all the results are I (1) variables, it implies that they are stationary at first difference. Both the Augmented Dickey-Fuller00 (ADF) and the Philips Perron test (PP) unit root test results are in line with each other. Hence, the test results have confirmed the absence of I (2) variables, the ARDL methodology is used for estimation.

4.4 Co-integration Analysis

Given that the primary objective of this study is to establish the nexus between taxation and economic growth therefore it is good to test for the existence long-run equilibrium relationship between these two variables within the framework of the bound testing approaching cointegration. The study employs annual time series data and therefore uses a lag length of one (1) in the bound test as determined by the result in Table 4.3. The dependent variable GDP is regressed on the other variables to ascertain the cointegration relationship between the dependent variable and independent variables. The F-test is used to determine whether there exists a long-run relationship of cointegration among the various variables or not.

Table 4.3: Bounds Test Result

Test Statistics	Value	Lag	Bound critical values (restricted intercept with no trend)		
			Significance Level	I (0)	I (1)
F-Statistic	18.89344		1%	2.88	3.99
K	6		5%	2.27	3.28
			10%	1.99	2.94

Note: *Based on Narayan (2004).

Source: Authors' computation (EViews 12).

From the result in Table 4.3 above, it is clearly shown that the calculated F-Statistic when taxation and the GDP (GDP) is the dependent variable is 18.89344, which is higher than the upper bound critical value of the 5 percent level of significance (18.89). It implies that the null hypothesis of no cointegration is rejected at the 5 percent level and therefore there is a need for a cointegration relationship between the taxation of GDP and its determinants. Ideally, the study concludes that there is the existence of cointegration among the variables in the tax equation, hence we proceed with the estimation of the long-run model.

4.5 Static Long-Run Results based on SIC-ARDL (1,2,2,2,1,2,2)

Given that the bounds test indicates the existence of cointegration, wherein LBTTRGDP was used as a dependent variable, it is good for us now to estimate the long-run model for the long-run coefficient. Below is the long-run result in Table 4.4.

Table 4.4 : Long-run Estimates Based on the SIC-ARDL (1,2,2,2,1,2,2)

Variables	Coefficients	Standard error	t-ratio	P-value
FDI	13.10795	3.305255	3.965790	0.0041
IRD	-0.027062	0.067279	-0.402234	0.6980
TAXES	-1.136008	0.394805	-2.877388	0.0206
OTHERS	-11.802996	6.414864	-1.839940	0.1031
EBOLA	-18.98832	4.340349	-4.374837	0.0024
WAR	-11.34453	2.247713	-5.047142	0.0010
C	17.39966	4.639198	3.750576	0.0056
Diagnostic test R-square (0.983599), Serial correlation (LM Test) (0.7845), Adjusted R-Squared (0.971572), Heteroscedasticity (0.6400), Normality Test (Jacque-Bera) (0.856630), Joint significance (F-Statistics) (14.70540)				

Note: ***, **, * denotes 1%, 5% and 10% significance levels respectively.

Source: Authors's computation (EViews 12).

The result in Table 4.4 above shows that foreign direct investment (FDI), direct tax, and other taxes are the most significant variables that affect the GDP in the long run. Ideally, the result establishes a positive relationship between foreign direct investment and economic growth, and the variable is statistically significant at the 5 percent level. Thus, a percentage increase in foreign direct investment will increase economic growth by 13.10793 percentage points at the conventional level of significance. Therefore, the finding is consistent with the priori expectation. Theory also affirms that there is a positive relationship between foreign direct investment and economic growth which is the dependent variable.

Similarly, both the interest rate and direct tax as a percentage share of the GDP are negatively related to the GDP and its variables are statistically significant at the 5 percent level, except the interest rate deposit is not significant at the 5% significance level. Thus, a percentage decrease in each of the sectors would automatically lead to a decrease in economic growth by -0.027062 and -1.136008 percentage points at a conventional level of significance respectively.

4.6 Short-Run Dynamics Coefficients based on SIC-ARDL (1,2,2,2,1,2,2)

Estimation results in Table 4.5 reveal that there is a negative relationship between economic growth and foreign direct investment in the short-run, which is significant at a 5 percent level in the short-run. From Table 4.4 above you can also notice that other tax has a negative relationship with economic growth in the short-run. Hence, it is significant at a 5 percent level in the short-run. This is due to the fact that the availability of alternative sources of funds will make the government relax its endeavour of mobilizing domestic revenue in the form of tax.

Table 4.5: Short Run Dynamic Results

Variables	Coefficients	Standard error	t-ratio	P-value
D(FDI)	-6.143259	2.729573	-2.250630	0.0545
D(FDI)(-1)	-19.92825	3.109831	-6.408147	0.0002
D(IRD)	0.234011	0.092887	2.519313	0.0358
D(IRD)(-1)	-0.330884	0.085934	-3.850439	0.0049
D(TAXES)	1.172695	0.523119	2.241737	0.0553
D(TAXES(-1))	0.800551	0.338620	2.364157	0.0457
D(OTHERS)	-6.991813	7.303023	-0.957386	0.3664
D(EBOLA)	-6.948671	2.384392	-.914189	0.0195
D(EBOLA(-1))	-13.80343	3.202512	-4.310188	0.0026
D(WAR)	-27.07668	2.362966	-11.45877	0.0000
D(WAR(-1))	-18.29813	2.111428	-8.666233	0.0000
ECT(-1)*	-0.773742	0.105363	-16.83454	0.0000
Diagnostic test R-square (0.983599), Mean dependent var. (0.041209), Adjusted R-Squared (0.971572), S.D. dependent var. (13.18082), SE Regression (2.222378), Akaike info criterion (4.736135), Sum of squared residuals (74.08443), Schwarz criterion (5.312062), Likelihood (-51.93782), Hannan-Quinn criterion (4.907388), Durbin-Watson stat (2.132688).				

Note: ***, **, * denote 1, 5, and 10 percent significance levels respectively.

Source: Authors' computation (EViews 12).

The coefficient of interest rate shows a positive relationship that exists between the interest rate deposit and economic growth. This remains significant at a 5 percent level but only in the short-run.

The short-run estimates also show that the Error Correction Term (ECT (-1)*) is negative and statistically significant at the 1 percent level. The implication of this is that the convergence process to long-run equilibrium is at an adjustment speed of 77.37%. That is, the error in the current year will be corrected in the coming years at a speed of 77.37%, which simply means that, in a very high speed of adjustment to long-run equilibrium.

In a nutshell, the value of the R-squared is 0.983599, implying that approximately 98% of the variation in the economic growth (GDP) model is explained by the independent variables which is an indication of a good fit. The overall model is statistically significant as shown by the probability value of the F-Statistic (0.005879).

4.7 Diagnostic and Parameter Stability Tests

By evaluating the statistical properties of the model in the long-run, a battery of tests was performed. This is to ensure that the model does not suffer from serial correlation, heteroscedasticity, and normality problems.

4.8 Serial Correlation

The null hypothesis cannot be rejected as the probability value is greater than the conventional 5 percent requirement of no serial correlation in the model. Thus, the model is free from serial correlation as shown in Table 4.6.

Table 4.6: Serial Correlation LM Test

F- statistic	0.080734	Prob. F (1,7)	0.7845
Obs*R-squared	0.307854	Prob. Chi-Squared (1)	0.5790

Source: Authors' computation (EViews 12)

4.9 Heteroscedasticity Test

The estimated model passes the test for heteroscedasticity test based on the regression squared residuals on squared fitted values. The heteroscedasticity test below shows the p-value of about 0.2460 which is approximately 25% more than the critical value of 0.05 or 5 percent. Thus, the model is homoscedastic.

Table 4.7: Test for Heteroscedasticity

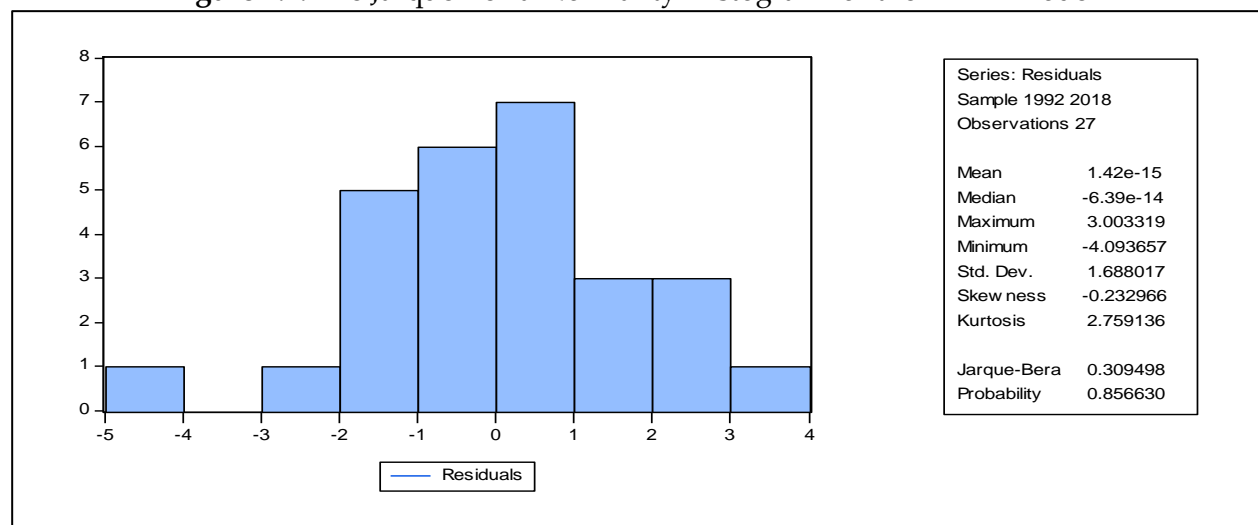
F- statistic	0.843402	Prob. F (18,8)	0.2460
Obs*R-squared	17.68212	Prob. Chi-Squared (18)	0.4768
Scaled explained SS	1.365388	Prob. Chi-Squares (18)	1.0000

Source: Authors' computation (EViews 12)

4.10 Normality Test Result

The model also passed the normality test based on the Jarquer-Bera value of 0.237453 and the probability of 0.888050 which is above the required 5 percent level. Thus, the residuals are normally distributed across observations as shown in Figure 4.1.

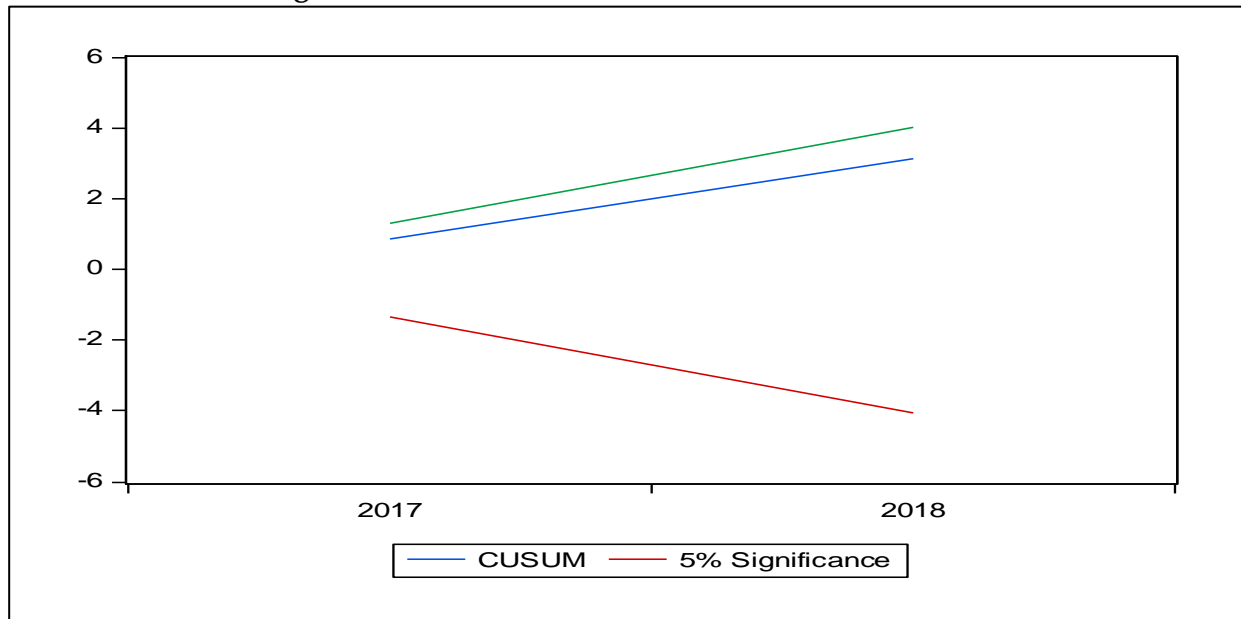
Figure 4.1: The Jarque-Berra Normality Histogram for the ARDL model



4.12 Stability Test

The stability of the regression coefficients is evaluated using the Cumulative Sum of (CUSUM) and the Cumulative Sum of Squares (CUSUMSQ) test for structural stability (Brown et al, 1975). The test results on both the CUSUM and CUSUMSQ tests reveal that the regression equation appears to be stable, as the test statistic lies within the 5 percent critical bound as shown in Figure 4.2 below.

Figure 4.2: Plot of Cumulative Sum Recursive Residuals



Source: Authors' computation (EViews 12).

The straight lines represent the critical bounds at the 5% significance level.

5. Conclusion and Policy Recommendations

Tax revenue holds paramount importance for any country, enabling governments to cater to citizens' welfare while reducing budget deficits and external borrowing. Adequate tax revenue reduces the burden of external borrowing, fostering economic growth by redirecting funds to productive sectors contributing to unemployment reduction, and attracting foreign direct investment (FDI). The study aligns with the Laffer curve, indicating that tax revenue increases with tax rates up to an optimum point.

Methodologically, the research carefully selects control variables, including indirect taxes, direct taxes, and other taxes, guided by empirical studies and analyzed using econometric techniques. Unit root and cointegration tests inform the identification of lag length, with the study revealing the importance of lagged variables in determining economic growth. Notably, the negative impact of direct taxes on economic growth emphasizes the need for a focus on international trade to attract FDI and increase exports. These variables were analyzed using econometric techniques as guided by Gujarati (2004) and other international studies in the field of study. The explanatory variables used in

the study are indirect taxes, direct taxes, and other taxes. To achieve the intended objective, pre-estimation tests, and stationarity tests were carried out. The augmented Dickey-Fuller test was used to test for the presence of unit root. The results showed that all variables were non-stationary at levels. Other taxes, interest rates, and FDI were revealed to have one-unit root. GDP and direct taxes showed the presence of uni two-unit roots since they became stationary at first differencing. These attributes of the data informed the researchers to identify the lag length and also check for cointegration using the Johansen test of cointegration. Five criteria (LR, FPE, AIC, HQIC and SBIC) for identifying lag length were used of which all recommended 4 lags. Johansen's test of cointegration revealed the presence of six cointegration equations.

The findings further revealed that lag one of GDP, lag one of direct taxes, lag one of other taxes, lag one of FDI, and lag one on interest rate are important in determining economic growth in Sierra Leone. The results showed that the coefficient of lag one of GDP is positive and significant at 5 percent in influencing economic growth in Sierra Leone. The coefficients of lag one and lag of other taxes were revealed to be negative and significant at 5 percent in influencing economic growth in Sierra Leone. Further, the coefficients of lag one of FDI and lag one of interest rate were found to be positive and separately significant at 5 percent in influencing economic growth in Sierra Leone.

Policy recommendations include reviewing the impact of fiscal, monetary, and international trade policies on direct taxes, other taxes, interest rates, and FDI. The findings suggest that Sierra Leone's economic growth is negatively affected by direct taxes but positively influenced by FDI. Policymakers are advised to concentrate on international trade to attract FDI, thereby increasing exports crucial for economic growth. Additionally, streamlining indirect taxes to be progressive and discriminatively applied to affluent segments is proposed. The central bank is urged to implement a monetary policy rate favoring Sierra Leone's economic growth.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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