

Macroeconomic Determinants of Domestic Revenue Generation in Sierra Leone: A Fiscal Policy Perspective

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ABSTRACT

This study examines the macroeconomic determinants of domestic revenue mobilization in Sierra Leone, proposing effective strategies for enhancing public sector revenue. Using a conceptual framework, the study focuses on key independent variables, including real GDP, government expenditure, inflation, domestic debt, population growth, and the tax-to-GDP ratio. It analyses their influence on domestic revenue performance. The research adopts a quantitative ARDL methodology, utilizing time series data from 2001 to 2024 to identify long- and short-run relationships among the variables. The findings reveal a long-term relationship among the variables, while real GDP, inflation, population growth, and tax effort positively and significantly influence domestic revenue; government expenditure and domestic debt show a negative and significant long-term relationship. In the short run, however, lagged government expenditure and domestic debt appear to have a positive effect. These results suggest that short-term fiscal injections can boost revenue, but unsustainable expenditure and borrowing weaken long-term fiscal health. The study concludes that a balanced and transparent fiscal strategy anchored on growth-friendly policies, debt sustainability, and efficient public spending is essential for strengthening Sierra Leone's domestic revenue capacity.

1. Introduction

Like many developing countries, Sierra Leone faces revenue shortfalls that hinder economic development and public service delivery. Despite various reforms, domestic revenue mobilization remains low (about 16% of GDP in 2024), far below the WAEMU benchmark of 20%. The Sierra Leone Ministry of Finance is implementing revenue enhancement strategies to improve the country's fiscal position and meet development objectives. Sustainable public service delivery in Sierra Leone hinges on robust and inclusive revenue systems. With domestic revenue averaging just over 11% of GDP, which is well below regional benchmarks, fiscal pressure has intensified Fiscal-Strategy-Statement-FSS-2023-2025 (n.d.). The Ministry of Finance (MoF) is responsible for driving reforms that enhance efficiency, transparency, and revenue collection performance.

The literature highlights the sustainability of external financing for development, as it is unpredictable, limits policy space, reduces a country's sense of ownership, and leads to long-term debt sustainability issues (Sen Gupta, 2007). Domestic resource mobilization (DRM) is now a significant focus in development plans like the Istanbul Programme of Action (IPA), Monterrey Consensus on Financing for Development (MCFD), Sustainable Development Goals (SDGs) 2030, and the African Union's Agenda 2063. Besides, suggestions abound that domestic resource mobilization can help developing countries enhance economic growth and development Wujung & Aziseh, 2016). Taxation is crucial for nation-building and is the primary source of domestic revenue for governments in both developed and developing countries. It is considered irreplaceable in the economy and is used to provide public goods, invest in infrastructure, and offer social welfare programs.

Moreover, tax revenue aids the government in planning, implementing development agendas, promoting private sector growth, and settling government obligations. It also facilitates resource distribution and minimizes dependency on foreign aid. Effective domestic revenue mobilization ensures prudent macroeconomic management, boosting economic growth by limiting foreign borrowing and promoting prudent macroeconomic management. Most developing countries face fiscal imbalances due to excessive government expenditure and low domestic revenue mobilization. To fund developmental projects, these countries face political issues, weak institutional capacities, low development, inefficient tax systems, underground economic activities, and chronic tax evasion Ayenew (2016). If African countries can rely on domestic revenue and internal sources, they can decrease their reliance on external funding and leverage domestic priorities, reducing their dependence on donor funding with its associated conditions.

African governments have made significant strides in modernizing and enhancing revenue administrations through progressive tax systems, improved tax policies, and efficient tax collection. However, the region still lags other regions in terms of tax revenue, with a tax-to-GDP ratio of 16.5% between 2000 and 2024, compared to 23.1% for Latin America and the Caribbean and 34.3% for the OECD. Improvement in domestic resource mobilization is crucial for developing countries, as increased resource inflow poses risks and low savings rates. Fiscal imbalances persist due to government expenditure surges and low revenue mobilization. Structural bottlenecks in these countries include weak institutions, low economic activity, high tax evasion, tax avoidance, a large informal sector, and high corruption, hindering effective tax reforms and efficient tax systems.

Furthermore, the Ministry of Finance in Sierra Leone needs to analyse revenue sources and collection methods due to fluctuating revenue streams. The government's fiscal space for development expenditure is limited by high levels of recurrent spending, with over half of total spending being nondiscretionary or rigid. This, combined with falling donor receipts, has increased fiscal stress. Larger expenditure variances have led to delays in supplier payments and increased domestic arrears. Lower tax revenue has widened fiscal deficits, and the government has increased its reliance on high-cost domestic borrowing, reducing fiscal space for investment and spending on key social sectors like health and education. The government must prioritize fiscal sustainability by realigning expenditure to increase the budget's development impact while reducing fiscal deficit and reversing rising public debt.

This requires strong fiscal discipline and political commitment to maintain expenditure within the budget envelope.

Avoiding unbudgeted expenditure increases can help reduce domestic borrowing and high interest payments. Sustained measures on expenditure and revenue fronts, combined with Public Financial Management (PFM) reforms, are necessary. Studies by Bosomtwe et al. (2025) highlight the impact of macroeconomic factors on income tax revenues in Ghana, underscoring the need for a nuanced understanding of the economic variables that influence revenue collection. These studies suggest that diverse factors beyond gold prices can affect revenue allocation, necessitating a multifaceted approach to revenue management. By incorporating these insights, Sierra Leone's Ministry can optimize revenue sources and improve collection methods, ensuring sustainable fiscal stability and effective resource allocation.

The study aims to identify the determinants of domestic revenue generation and provide policy options that could significantly boost revenue mobilization. This paper is guided by the following research question: "How can the government of Sierra Leone, through the Ministry of Finance, enhance domestic revenue generation? The autoregressive distributed lag (ARDL) estimation technique is used, a dynamic heterogeneous model that allows for lagged and differences between dependent and independent variables. The study is organized into 6 sections. Section 2 discusses the current challenges in domestic revenue generation and suggests strategies to enhance this process. Section 3 includes the conceptual framework, empirical findings in the literature on the main drivers of tax/domestic revenue in Section 4, methodology and results discussion in Section 5, and conclusion, with recommendations provided in the final section.

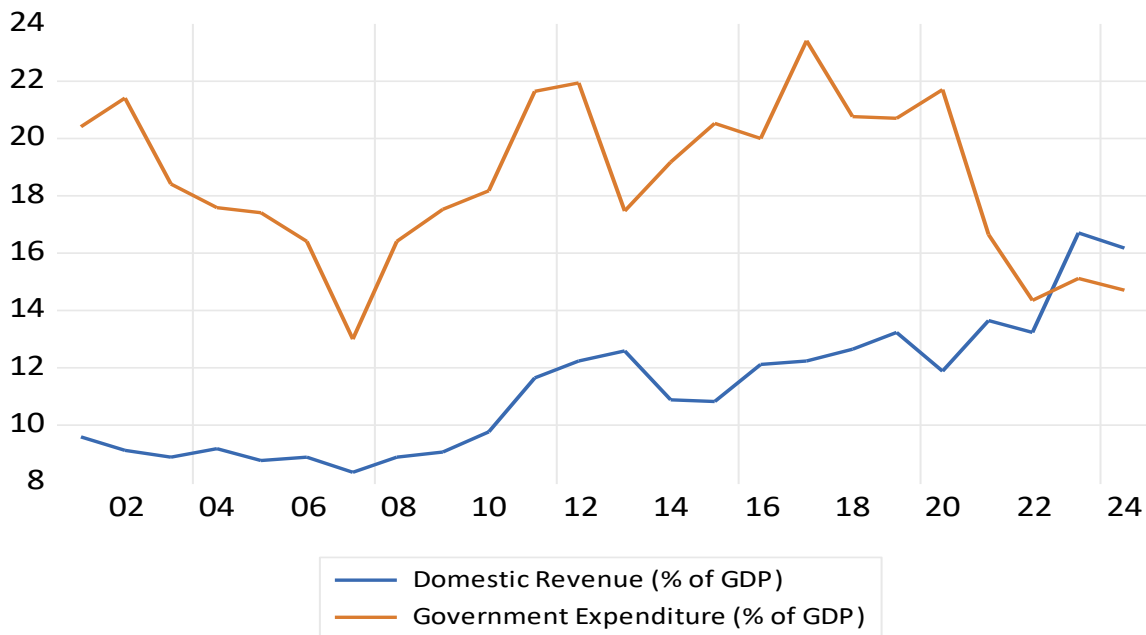
2. Current challenges in domestic revenue generation

Sierra Leone's economic situation is escalating, with increasing financial pressure forcing the government to find alternative ways to raise resources, and the informal economy comprises over 60% of the economy. The main challenge is tax evasion and avoidance, exacerbated by complex tax laws and loopholes, weak enforcement systems, corruption, and political interference. This leads to budget deficits and a lack of funds for essential public services, as governments struggle to collect the full amount of tax revenue owed. The Sierra Leone government established the National Revenue Authority (NRA) to enhance domestic revenue mobilization. The NRA assesses and collects revenue and makes necessary amendments to revenue laws. Since its inception, the NRA has introduced and updated several initiatives and Acts.

The government uses domestic revenue mobilization to achieve poverty reduction, financial independence, and transition to middle-income status. Despite improvements, the country's tax revenue is below the 20% minimum required by the UN (2015) for achieving the Sustainable Development Goals (SDGs). From 2000 to 2024, the country's average tax revenue was around 9.9%, nearly twice less than that of Africa (16.5%).

Figure 1. Trend in Domestic Revenue and Government Expenditure as a percentage of GDP

Trend in Domestic Revenue and Government Expenditure as a percentage of GDP



Source: NRA (2022) and MoF (2022)

The analysis of domestic revenue and government expenditure as percentages of GDP from 2001 to 2024 reveals a persistent fiscal gap. From 2001 to 2024, domestic revenue remained under 11% of GDP, with government expenditure averaging over 18%. Despite slight improvements in domestic revenue between 2008 and 2014, it still lags public spending. From 2001 to 2008, domestic revenue averaged 8.9% of GDP. However, it increased gradually to 10.6% between 2009 and 2012, and between 2013 and 2014, it declined due to the closures of two major mines and the Ebola outbreak. After a rebound, domestic revenue improved between 2015 and 2018, reaching 12% of GDP in 2018. This increase was largely due to political stability and increased economic activities, particularly in the mining and services sectors.

The Ebola outbreak in 2014 and the COVID-19 pandemic in 2020 led to increased expenditure, while revenue collection declined. Domestic revenue stabilized at 14% of GDP from 2021 to 2024, while government expenditure remained high at 24%. The mismatch between spending decisions and revenue capacity indicates a need for more disciplined fiscal planning, better alignment between spending and revenue reforms, and a stronger focus on domestic resource mobilization to reduce borrowing and external aid reliance.

The figures show that government expenditure, which accounts for a significant portion of GDP, outperforms domestic revenue, as shown in Figure 1. Over the years, the country has implemented fiscal policies focusing on taxation as a tool for economic development. However, domestic revenue mobilization remains low, and the country relies on external funding and domestic borrowing for investment, often relying on official development assistance from abroad for infrastructure projects. Excessive reliance on volatile and unpredictable financing sources can lead to a long-term debt trap, making domestic revenue generation crucial for medium- and long-term planning. Therefore, it is essential to raise revenue domestically for a more stable revenue source.

2.1. Strategies for enhancing domestic revenue generation

The literature suggests several strategies for the Sierra Leone Ministry of Finance to boost public sector/domestic revenue through tax reforms, improved tax administration, digitalization, and financial inclusion. Tax reforms involve broadening the tax base and adjusting tax rates to optimize revenue collection I. Kamara (2021). Sierra Leone needs to implement tax reforms to streamline its fiscal structures and effectively mobilize revenue. These reforms involve modernizing tax laws, broadening the tax base, and adjusting tax rates, involving the inclusion of more businesses and individuals in the formal tax system. In Sierra Leone, Goods and Services Tax (GST) is a significant revenue source, based on the value added at each stage of production or distribution of goods and services. Efficient collection at multiple stages of the supply chain can enhance VAT revenue A. K. Kamara & Kamara (2023). Policymakers should consider the potential net revenue from rural areas when expanding property taxation, as it could boost the government's own-source revenue. This requires reliable data on costs and revenue associated with rural taxation. Tax reforms can improve accountability and responsible use of tax revenues by aligning state policies with citizens' needs and expectations A. K. Kamara (2024a)

Moreover, tax administration is one of the tools that tax authorities use, and improving tax administration includes enhancing the efficiency of revenue collection, reducing tax evasion, and strengthening the capacity of tax officials (Hassan Elsan Mansaray, 2022). The National Revenue Agency (NRA) plays a crucial role in revenue mobilization, assisting the government in achieving poverty reduction, financial independence, and middle-income status goals. Additionally, E-governance is one such tool that can enhance public enterprises' performance by improving revenue collection and customs administration, while taxpayer compliance depends on effective fund utilization and ease of tax payment (Akinyosoye-Gbonda, 2024). Tax compliance is also key as it is enhanced by raising awareness and educating taxpayers about their obligations, with their willingness to comply influenced by their perception of the good use of collected funds. Sierra Leone's tax revenue is influenced by real GDP, openness, and official development assistance, with policies promoting economic growth and trade potentially boosting revenue (Tarawalie & Hemore, 2021).

Furthermore, Digitalization can play a crucial role in enhancing revenue generation by improving efficiency, reducing corruption, and expanding the tax base Oti-Akenteng et al. (2025). Digital governance tools can enhance fiscal mobilization, citizen engagement, and resource distribution at the local government level by streamlining processes, reducing costs, and improving transparency. Mobile money taxes can boost tax revenue, but their potential impact on financial inclusion must be considered, requiring a delicate balance between revenue mobilization and financial inclusion Mpfu (2022). Digital tax policies can boost revenue, particularly at the local council level, by automating and improving monitoring to reduce irregularities in revenue sharing.

On the other hand, promoting financial inclusion can expand the tax base and increase revenue generation by bringing more people into the formal financial system. Enhancing the financial system can enhance access to finance for businesses and individuals, thereby boosting economic activity and tax revenue, and addressing challenges like limited access and

shallow financial depth is crucial for financial sector development Bah (n.d.). Similarly, inclusive growth, where economic benefits are shared among all societal segments, can enhance tax compliance. Citizens who perceive their tax contributions as contributing to enhanced welfare are more likely to comply with their tax obligations. Sustainable fiscal policies are crucial for economic stability, preventing excessive public debt and hindering growth. Strengthening public financial management can improve budget execution, transparency, and revenue mobilization. These improvements lead to more efficient use of public resources and better utilization of resources.

Finally, improving the quality of governance, including controlling corruption and enhancing government effectiveness, can boost revenue generation. Good governance fosters trust and encourages compliance with tax laws, while sectoral growth and public expenditure influence tax revenue performance (Mawejje & Munyambonera, 2016). Governments should focus on policies promoting growth in key sectors and ensuring efficient public expenditure to improve tax revenue performance. Research shows that financial sector development can boost tax revenue generation, and robust tax policies and improved compliance are crucial for enhancing public sector revenue. The National Revenue Authority (NRA) serves as an engine for economic growth in Sierra Leone (Hassan Elsan Mansaray, 2022).

3. Conceptual Framework

This paper examines revenue generation in the context of how independent variables affect domestic revenue and interact with one another. The relationship between domestic revenue, real GDP, government expenditure, inflation, domestic debt, population growth, and total taxes is complex and can be positive or negative, as illustrated in Figure 2 below. Firstly, population growth can boost domestic revenue by increasing the labor force and consumer base, but this effect depends on factors like employment rates, education levels, and population health. With a growing population, the contribution of the ratio of total taxes led the government to spend, but the domestic revenue indicates the effectiveness of government policies in capturing a larger share of economic output through taxation (Umeokwobi & Nkoro (2019). Government expenditure can stimulate economic activities through multiplier effects, but its impact on domestic revenue depends on its efficiency and effectiveness. If government spending leads to economic growth, it can positively impact revenue, while inefficient spending or non-productive activities may not generate enough revenue to offset the initial expenditure.

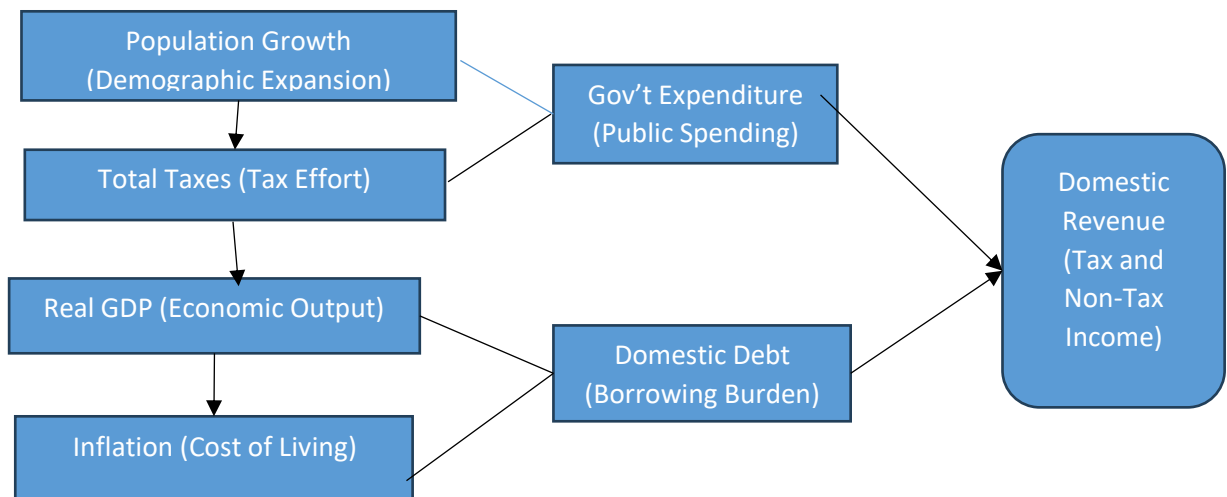


Figure 2: The diagrammatic illustration of a set of variables. Source: Own Conceptual Illustrations (2025)

Furthermore, higher real GDP leads to increased economic activity, expanding the tax base, and enhancing tax revenue collection. As businesses and individuals earn more, they pay more taxes, boosting domestic revenue. In the case of inflation, moderate inflation can stimulate consumption and increase nominal tax revenues in the short term, but excessive inflation can erode the real value of tax revenues and distort economic decision-making, potentially decreasing the tax base. High inflation can lead to increased public spending and reduced economic growth, negatively affecting domestic revenue Balima et al. (2020). Sierra Leone's high inflation (42.71% in February 2023) threatened progress in Sustainable Development Goals implementation. Lastly, rising domestic debt can force governments to improve revenue collection mechanisms, constrain spending on essential services and infrastructure, and potentially hinder economic growth. Fiscal prudence is crucial for promoting debt sustainability, as it can also reduce future revenue.

The Sierra Leone Ministry of Finance should enhance tax administration to reduce tax evasion and broaden the tax base. This includes strengthening the National Revenue Authority's capacity and implementing e-governance solutions. Policies promoting sustainable economic growth, such as infrastructure and human capital development, are crucial for increasing domestic revenue. The government should manage domestic debt levels to avoid crowding out productive investments and ensure fiscal sustainability. Controlling inflation is essential for maintaining the real value of tax revenues and promoting economic stability. Good governance, including control of corruption and improved regulatory quality, can enhance revenue generation by fostering trust and encouraging tax compliance. Aligning tax policies with the Sustainable Development Goals (SDGs) can promote sustainable and inclusive growth, addressing inequality, improving health outcomes, and protecting the environment. Table 1 below shows the explanation of the variables.

Table 1. Summary of variables, their hypothesized signs, and explanations

| Variable | Type | Definition | Source | Hypothesized Sign |
|---------------------------------------|-------------|--|-----------|--------------------|
| Domestic Revenue (% of GDP) | Dependent | Total government revenue (tax and non-tax) as a % of GDP | NRA | Dependent Variable |
| Real GDP Growth (%) | Independent | Annual % growth of real GDP | Stats. SL | + |
| Government Expenditure (% GDP) | Independent | Total government spending as a share of GDP | MoF | + / - |
| Inflation (CPI, %) | Independent | Annual % change in Consumer Price Index | Stats. SL | + / - |
| Domestic Debt (% of GDP) | Independent | Government domestic borrowing relative to GDP | MoF | - |
| Population Growth (%) | Independent | Annual growth rate of the total population | Stats. SL | + |
| Tax-to-GDP Ratio (%) | Independent | Ratio of total tax revenue to GDP | NRA | + |

Source: MoF, NRA, and Stats. SL (2022)

4. Empirical Literature Review

The literature on domestic/tax revenue generation and its determinants has yielded mixed results due to differences in methodology, period, and country characteristics. Most studies establish a correlation between domestic revenue generation, institutional development, and structural variables. A recent study by Tarawalie & Hemore (2021) looked at the determinants of tax revenue in Sierra Leone between 1990Q1 and 2020Q1. Tax revenue in Sierra Leone is influenced by factors such as real GDP, openness, and official development assistance (ODA). The studies using the ARDL framework show a long-term relationship between these variables and tax revenue. Real GDP positively affects tax revenue, suggesting economic growth expands the tax base. Openness, referring to international trade, also contributes positively, indicating significant trade-related taxes. Tax reforms are crucial for Sierra Leone to improve fiscal structures and revenue mobilization. These reforms aim to enhance revenue collection efficiency, a vital aspect for emerging nations Samuels & Duramany-Lakkoh, (2023).

A well-structured tax system fosters a fiduciary relationship between taxpayers and the government, promoting effective revenue mobilization.

Değirmenci (2024) investigates the impact of tax revenues and public expenditures on Turkey's Sustainable Development Index from 1990 to 2019. Results show that tax revenues positively influence sustainable development, while public expenditures negatively influence it, suggesting that Turkey should balance its tax and expenditure policies to achieve sustainable development goals. Bonzu (2022) investigates the sustainability of Sierra Leone's fiscal policy and its cointegration relationship between government revenue and expenditure. The results show that the fiscal policy is sustainable during the review period, and the cointegration between government spending and revenue is positive but less than one. This suggests that for each percentage point of GDP increase in government expenditure, government revenues increase by less than one percentage point of GDP. Bangura (2020) analysed the impact of tax revenue on Sierra Leone's economic growth from 1987-2017, using an ex-post facto design. Data from various tax components and GDP were collected, and the results showed that tax revenue significantly impacted economic growth, while companies' income tax, customs excise duties, and road taxes did not.

A. K. Kamara & Kamara (2023) in their study on the Impact of tax strategies on revenue mobilization in Sierra Leone, they highlight the need for adjustments to tax strategies in Sierra Leone, including revising zero-rated supply lists and reevaluating tax-exempt institutions. It emphasizes the importance of trade tax reform for developing countries, considering the unique challenges of informal economies. The study also highlights the need for resilience in revenue generation amidst external events like Ebola and COVID-19. According to a study on tax revenue in sub-Saharan Africa by Dhaneshwar Ghura, n.d., economic policies and degrees of corruption have an impact on the tax revenue-to-GDP ratios in 39 sub-Saharan African nations between 1985 and 1996. These ratios rise as structural changes, corruption, human capital, and inflation decline, and income has an impact on tax revenue. In a similar study done by Addison & Levin, n.d. analyse tax revenue determinants in 39 sub-Saharan African countries from 1980-2005, considering factors like tax base, structural factors, foreign aid, and conflict. It finds that the tax-to-GDP ratio is higher in open, less agriculturally dependent, less populous, and peaceful countries. The introduction of VAT positively impacts the total tax-GDP ratio. The agricultural sector and foreign aid negatively affect the direct-tax GDP ratio.

Kitessa & Jewaria (2018) on tax revenue in East African countries using cross-sectional data from 1992 to 2015 found that foreign aid, trade openness, GDP per capita, agriculture, services, and industry positively affect tax revenue, while exchange rate, inflation, and urbanization have a negative impact. Ayenew (2016) used Johannsen's cointegration analysis to analyse tax revenue from 1975 to 2013, finding that GDP per capita, the industrial sector, and foreign aid positively impacted tax revenue, while inflation negatively affected it. Minh Ha et al. (2022) examine tax revenue determinants in Southeast Asia using a balanced dataset of eight countries and employing static (pooled Ordinary Least Squares (OLS), fixed effects (FE) model, random effects (RE) model, and Driscoll-Kraay standard error) as well as dynamic panel data (system-generalized method of moments). Results show that economic openness, foreign direct investment, foreign debt to GDP ratio, industry value added to GDP, and

official development assistance positively impact tax revenue. GÖKPINAR (2023) examines the impact of various factors on tax revenues in Turkey, including the USD/TL exchange rate, M2 money supply, industrial production index, deposit interest rate, unemployment rate, and export variables, on the tax level from 2006M1-2022M11 using ARDL methods. The results show a cointegration relationship between tax revenues and all series, with M2 money supply, industrial production index, and deposit interest rate positively affecting tax levels, while unemployment rate and USD/TL exchange rate affect the tax level negatively.

Leone et al., (2023) examine the low tax revenue in Sierra Leone from 1988 to 2018, using the ARDL bound testing co-integration estimation technique. A log level multiple regression model was used, focusing on the buoyancy of total tax revenue and the percentage share of service value added, import, industry, money supply, and the agricultural sector. The results show that the agricultural sector, industry, and service value added positively affect the buoyancy of total tax revenue. Imports and money supply were found to be insignificant in the long run. While Saibu (1970) study, the macroeconomic determinants of Nigeria's tax revenue from 1970 to 2011, found that inflation negatively impacts tax revenue, while exchange rate and income positively affect it. The empirical literature has shown that domestic revenue is determined by various factors, including structural, economic, and institutional factors, with varying outcomes.

Furthermore, despite the abundant literature on the determinants of domestic/tax revenue, there are only a few mentions of Sierra Leone. Thus, this study contributes to the existing literature to identify the main determinants of domestic revenue generation in Sierra Leone, a country epitomized by a large budget deficit, on account of huge government expenditure, low revenue mobilization, high dependence on external funding, modest growth rate, and high inflationary pressure.

5. Research Methodology

The study used a quantitative research approach to investigate the causal relationship between domestic revenue mobilization and its determinants in Sierra Leone. It uses the ARDL bound testing technique for the estimation of variables in the Sierra Leone economy, influenced by the structure and data availability. The dynamic heterogeneous model provides a framework for lagged and difference variables, making it suitable for situations with I (0) and I (1) variables. The technique also establishes cointegration among variables, providing realistic and efficient estimates. This approach is preferred for situations where variables are of I (0) and I (1). The empirical model for this study is given as follows.

$$DR = \alpha + \beta_1 GE_t + \beta_2 DD_t + \beta_3 CPI_t + \beta_4 RGDP_t + \beta_5 POG_t + \beta_6 TT_t + \varepsilon \dots\dots (1)$$

Where: DR=Domestic revenue mobilization as a % of GDP, GE =Total government expenditure as % of GDP, DD=Total domestic debt as % of GDP, RGDP=Real gross domestic product, POG=Population growth, TT=Total taxes as % of GDP. Note: α is the constant term, β_{1-6} are the relevant coefficients for the appropriate variable, and ε represents the random error term. The study employs various criteria, such as Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), Hannan-Quinn Information Criterion (HQ), and Final

Prediction Error (FPE), to determine the optimal lag length for the ARDL Bounds test. Equation (1) can be transformed and specified in an ARDL form as.

$$\Delta DR_t = \delta_0 + \sum_{i=1}^p \alpha_{1ti} \Delta DR_{t-1} + \sum_{i=0}^q \alpha_{2ti} \Delta GE_{t-1} + \sum_{i=0}^q \alpha_{3ti} \Delta DD_{t-1} + \sum_{i=0}^q \alpha_{4ti} \Delta CPI_{t-1} + \sum_{i=0}^q \alpha_{5ti} \Delta RGDP_{t-1} + \sum_{i=0}^q \alpha_{6ti} \Delta POG_{t-1} + \sum_{i=0}^q \alpha_{7ti} \Delta TT_{t-1} + \vartheta DR_{t-1} + \gamma_1 GE_{t-1} + \gamma_2 DD_{t-1} + \gamma_3 CPI_{t-1} + \gamma_4 RGDP_{t-1} + \gamma_5 POG_{t-1} + \gamma_6 TT_{t-1} + \varepsilon_t \dots (2)$$

The study uses equation (2) to test for cointegration, where p and q represent the maximum lag for dependent and independent variables, Δ and represent the difference operator, and δ₀ represents the drift component. The long-run coefficients are represented by γ_i's (i=1, 2, ..., 6) while the dynamic components with α's reflect the short-run. The study tests cointegration using bound tests, comparing the null hypothesis of no cointegration against the alternative hypothesis of cointegration, based on equation (2).

$$h_0: \alpha_1 = \alpha_2 = \dots = \alpha_7 = 0 \text{ (No cointegration)}$$

$$h_1: \alpha_1 \neq \alpha_2 \neq \dots \neq \alpha_7 \neq 0 \text{ (cointegration)}$$

This model examines critical values against the F-statistic of cointegration, determining if the F-statistic is larger than the upper bound limits critical value at a given significance level. If larger, the null of no cointegration is rejected, confirming the existence of a long-run relationship. If larger, equation (2) is reparametrized to reflect an error correction model. A reparametrized ARDL model is presented as thus.

$$\Delta DR_t = \delta_0 + \sum_{i=1}^p \alpha_{1ti} \Delta DR_{t-1} + \sum_{i=0}^q \alpha_{2ti} \Delta GE_{t-1} + \sum_{i=0}^q \alpha_{3ti} \Delta DD_{t-1} + \sum_{i=0}^q \alpha_{4ti} \Delta CPI_{t-1} + \sum_{i=0}^q \alpha_{5ti} \Delta RGDP_{t-1} + \sum_{i=0}^q \alpha_{6ti} \Delta POG_{t-1} + \sum_{i=0}^q \alpha_{7ti} \Delta TT_{t-1} + \rho ECT_{t-1} + \varepsilon_t \dots (3)$$

Equation (3) displays a model in first difference with an error correction term (ECT), indicating the model's speed of adjustment for short-run disequilibrium to the long-run. The study utilized annual secondary data from 2001 to 2024, sourced from the Sierra Leone National Revenue Authority (NRA), Statistics Sierra Leone (Stats. SL), and the Sierra Leone Ministry of Finance (MoF).

6. Results and Discussion

6.1. Correlation Matrix

Table 2 presents correlation results, revealing a negative correlation between DR and GE, with the highest score observed for DR and TT. All other variables, except GE, DD, and CPI, negatively affect DR, while RGDP, POG, and TT show a positive correlation with DR.

Table 2: Correlation Matrix

| | DR | GE | DD | CPI | RGDP | POG | TT |
|----|--------|----|----|-----|------|-----|----|
| DR | 1.0000 | | | | | | |

| | | | | | | | |
|------|---------|---------|---------|---------|--------|--------|--------|
| GE | -0.0537 | 1.000 | | | | | |
| DD | -0.2720 | -0.0065 | 1.0000 | | | | |
| CPI | -0.7236 | -0.4367 | -0.0897 | 1.0000 | | | |
| RGDP | 0.0057 | 0.0303 | 0.1921 | -0.1217 | 1.0000 | | |
| POG | 0.4240 | 0.2838 | 0.8266 | -0.4672 | 0.2788 | 1.0000 | |
| TT | 0.8255 | 0.3214 | -0.1977 | 0.4184 | 0.0179 | 0.3206 | 1.0000 |

Source: Researcher's computation using output from EViews 12

The study reveals a negative correlation between domestic revenue, government expenditure, and domestic debt, a positive and strong correlation with population growth and total taxes, but a weak correlation with real gross domestic product growth, and a strong negative correlation between domestic debt and inflation.

6.2. Unit root test results

The study uses a unit root test to determine variable stationarity, the ADF technique for time series stationarity, and the PP test for robustness, both validated at 5% significance levels. The study reveals mixed order integration of variables at the level and after taking the first difference, as shown in Table 3 below.

Table 3: Stationarity Test

| Variables | ADF- Test | | | PP-Test | | |
|-----------|-----------|----------------|-------|----------|----------------|-------|
| | Level | 1st difference | Order | Level | 1st difference | Order |
| DR | -0.187 | -5.932** | I (1) | 0.125 | -5.919** | I (1) |
| GE | -1.990 | -5.122** | I (1) | -1.990 | -5.130** | I (1) |
| DD | -4.439** | | I (0) | -3.061** | | I (0) |
| CPI | -0.477 | -5.699** | I (1) | -1.518 | -4.218** | I (1) |
| RGDP | -5.328** | | I (0) | -5.328** | | I (0) |

| | | | | | | |
|-----|--------|----------|-------|----------|----------|-------|
| POG | -0.383 | -7.984** | I (1) | -4.654** | | I (0) |
| TT | -1.262 | -5.173** | I (1) | -1.225 | -5.173** | I (1) |

Source: Researcher's computation using output from EViews 12 (** reflects significance at the 5% level)

DD and RGDP are stationary in levels, while DR, GE, CPI, POG, and TT are stationary in the first difference. However, for the PP-test, all variables are stationary after the first difference, except DD, RGDP, and POG, which are stationary in level.

6.3. Lag selection criteria

The study identifies the optimal lag length to avoid misleading estimation results, with the optimal lag of two (2) as shown in Table 4, consistent with the selection criteria, as suggested by the literature. Inaccurate selection can lead to imprecise estimation results.

Table 4. Optimal Lag Selection Criteria

| Lag | FPE | AIC | SC | HQ |
|-----|-----------|-----------|-----------|-----------|
| 0 | 9169,622 | 28,98835 | 29,3355 | 29,07013 |
| 1 | 4,299291 | 21,07952 | 23,85672 | 21,73374 |
| 2 | 0.158139* | 15.91126* | 21.11851* | 17.13793* |

Source: Researcher's computation using output from EViews 12 (*Indicates lag order selected by the criterion)

6.4. Result of the Bounds Cointegration Test

The study employs the ARDL bounds test cointegration approach to determine if a long-run association among variables exists. It tests the null hypothesis of no cointegration against the alternative of cointegration. If the F-statistic exceeds the upper bound at 10%, 5%, and 1% significance levels, the null hypothesis is rejected, confirming no cointegration. The study's F-statistic (19.06) is higher than the upper bound (I (1)) at 1%, 5% and 10% levels of significance, indicating cointegration and a long-term relationship among the variables shown in Table 5.

Table 5: ARDL Bounds Test Result

| Test Statistic | Value | Significant | Bound Critical Values | |
|----------------|-------|-------------|-----------------------|-------|
| | | | I (0) | I (1) |
| | | | | |

| | | | | |
|--------------|-------|-----|------|------|
| | | 10% | 1.99 | 2.94 |
| F-statistics | 19.06 | 5% | 2.27 | 3.28 |
| k | 6 | 1% | 2.88 | 3.99 |

Asymptotic: n=1000

Source: Researcher's computation using output from EViews 12

6.5. Long-Term Results of ARDL Estimation

The long-run ARDL estimation results from Table 6 reveal that government expenditure (GE) and Domestic debt (DD) negatively and significantly affect domestic revenue mobilization in Sierra Leone. A one-percent increase in government expenditure can decrease domestic revenue mobilization by 0.44%, suggesting that an increase in government expenditure will decrease domestic revenue collection. Government spending negatively impacts domestic revenue in the long term, suggesting inefficiency, poor targeting, or non-productivity. If funds are directed towards non-growth-generating uses or lost through corruption, they fail to stimulate economic activity needed to expand the tax base.

The result is statistically significant at the 5% level, aligning with the findings of Omimakinde & Onifade (n.d.). Similarly, rising domestic debt reduces fiscal space due to debt servicing obligations, crowding out vital services, and undermining future tax intake. Therefore, a cautious and strategic borrowing approach is needed. Thus, a one-percent increase in domestic debt will cause domestic revenue in Sierra Leone to decrease by 0.23 %. The literature indicates that government expenditure and domestic debt significantly impact domestic revenue mobilization Roble & Ibrahim (2024), with domestic debt challenges in Sierra Leone primarily due to inadequate GDP and poor debt management, resulting in a domestic-debt-to-GDP ratio of 20.38% Kofi Asravor et al. (2023).

Table 6. Long-Run ARDL Estimation Result (1,2,1,1,0,2,2)

| Variables | Coefficient | Std. Error | t-stat | Prob |
|-----------|-------------|------------|---------|--------|
| GE | -0.4351 | 0.1051 | -4.1379 | 0.0061 |
| DD | -0.2263 | 0.0330 | -6.8504 | 0.0005 |
| CPI | 0.1073 | 0.1217 | 4.9300 | 0.0026 |
| RGDP | 0.1417 | 0.0603 | 2.3483 | 0.0572 |

| | | | | |
|----------|--------|--------|--------|--------|
| POG | 1.4126 | 0.3713 | 3.8045 | 0.0089 |
| TT | 1.4761 | 0.1956 | 7.5435 | 0.0003 |
| Constant | 3.2206 | 1.2142 | 2.6523 | 0.0379 |

Source: Researcher's computation using output from EViews 12

Furthermore, a moderate price increase can boost nominal tax collections, especially VAT and excise duties, if the tax system is responsive, but high inflation can erode revenue, so stable inflation with indexed taxation systems supports revenue goals. Economic growth boosts employment, business profits, and consumption, contributing to increased domestic revenue, emphasizing the significance of pro-growth policies and private sector development. Fiscal policy, which includes government expenditure, is crucial for economic growth and poverty reduction Roble & Ibrahim (2024). Similarly, the study indicates that an increase in total taxes (TT), at a 5% significance level, can significantly boost domestic revenue mobilization by 1.5%. The literature concludes that tax revenue has a significant effect on domestic revenue mobilization, which will lead to economic growth in Sierra Leone Bangura (2020), while another study, A. K. Kamara (2024b), suggests a positive relationship between value-added tax and increased revenue collection, except during the Ebola and COVID-19 pandemics. At the 5% significance level, a one-percent increase in population growth (POG) leads to a 1.4% increase in domestic revenue. This suggests that POG enhances revenue efforts, thereby increasing a country's revenue-generating potential.

6.6. Short-Term Results of ARDL Estimation

Table 7 presents the short-run ARDL estimation result, which was estimated using an ARDL lag structure of (1,2,1,1,0,2,2) based on the AIC. The critical review reveals that the speed of adjustment term, ECT, is statistically significant at the 5% level. The study reveals that short-run imbalances can be corrected at an annual 76% adjustment speed. Despite the high adjustment speed, the result reaffirms that there is a long-run relationship. Furthermore, results of the short run have seemed consistent with the long run findings, only that the lag value of government expenditure and domestic debt are positively correlated with domestic revenue mobilization.

The positive correlation between government expenditure and domestic debt with domestic revenue mobilization in the short and long run may be due to the belief that higher government expenditure, particularly in productive sectors or infrastructure development, can stimulate economic growth and improve tax compliance. Increased domestic debt may also indicate government efforts to meet fiscal deficits, potentially leading to increased revenue mobilization Bonzu (2022). Higher public investment in developing economies like Africa and Sierra Leone often stimulates economic activities, increasing the taxable base Duramany-Lakkoh et al. (2022)

Table 7. Short-Run ARDL Estimation Result (1,2,1,1,0,2,2)

| Variables | Coefficient | Std. Error | t-stat | Prob |
|--------------------|-------------|------------|-----------|--------|
| D(GE) | -0.0406 | 0.0158 | -2.5681 | 0.0424 |
| D(GE (-1)) | 0.1051 | 0.0197 | 5.3178 | 0.0018 |
| D(DD) | 0.1368 | 0.0305 | 4.4740 | 0.0042 |
| D(CPI) | 0.0472 | 0.0048 | 9.7171 | 0.0001 |
| D(POG) | 0.1633 | 0.1275 | -1.2810 | 0.2475 |
| D(POG (-1)) | -0.5059 | 0.1158 | -4.3662 | 0.0047 |
| D(TT) | 0.7919 | 0.0476 | 16.6204 | 0.0000 |
| D(TT (-1)) | -0.5194 | 0.0523 | -9.9165 | 0.0001 |
| ECT | -0.7629 | 0.0419 | -18.17687 | 0.0000 |
| R-Squared | | 0.9893 | | |
| Adj. R-Squared | | 0.9823 | | |
| Durbin-Watson Stat | | 3.39 | | |

Source: Researcher's computation using output from EViews 12

The literature on revenue mobilization in Africa emphasizes the importance of governance quality, economic policies, and expenditure productivity as key factors for efficient revenue mobilization (Tarawalie & Pokawa, 2024). The study reveals that total taxes, domestic debt, and population growth are key determinants of short-term domestic revenue generation. The government expenditure (GE) negatively and significantly impacts the domestic revenue (DR) generation, while it first lags positively, and impacts it, with a percentage increase in lagged government expenditure leading to a 0.1% short-term increase. This suggests that the current government expenditure is positively impacted by the previous annual period's domestic revenue generation. The short-run results indicate that a one-percent increase in domestic debt (DD) leads to a 0.1% increase in domestic revenue generation (DR), while a one-percent increase in inflation (CPI) and population growth (POG) increases DR by 0.04% and 0.16% respectively. Additionally, a one-percent increase in total

taxes (TT) increases DR by 0.79% while it lags value decreases by 0.51%. The study also found that over 98% of the dependent variable's variation is explained by the regressions, as indicated by R-squared.

6.7. Diagnostic Tests

The model was tested for serial correlation, heteroscedasticity, and stability. Results are presented in Table 8 and Figures 3 and 4. The study found that the model is free from serial correlation, as it cannot reject the null of no correlation under the Breusch-Godfrey Serial Correlation LM Test. Additionally, the study cannot reject the null hypothesis of homoscedasticity, indicating constant residual variance.

Table 8. Serial Correlation and Heteroscedasticity Tests

| Statistics | F-Stat | Prob. |
|---|--------|-------|
| Breusch-Godfrey Serial Correlation LM Test | 23.042 | 0.064 |
| Breusch-Pagan-Godfrey Heteroscedasticity Test | 2.39 | 0.154 |

Source: Researcher's computation using output from EViews 12

Finally, the study uses the Cumulative Sum (CUSUM) and the Cumulative Sum of Squares (CUSMSQ) test to assess model stability using time series data. The results indicate that the model coefficients are stable, as the CUSUM is within the critical band of 5% level of significance, indicating their relevance.

Figure 3. Model Stability Test

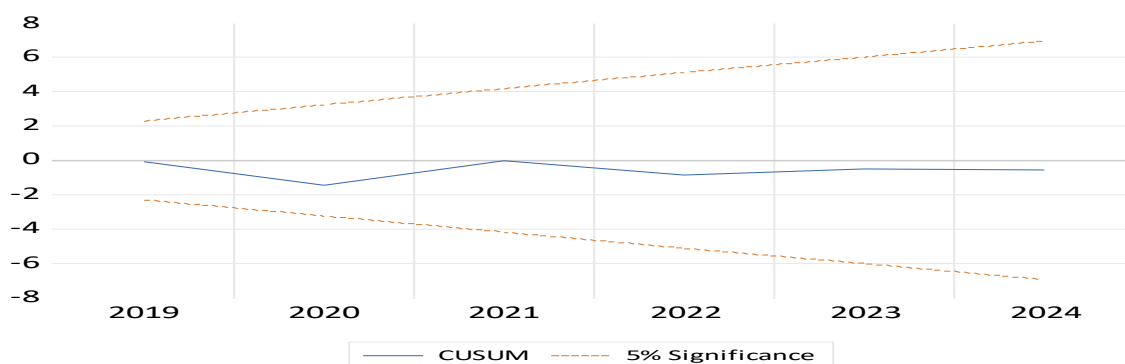
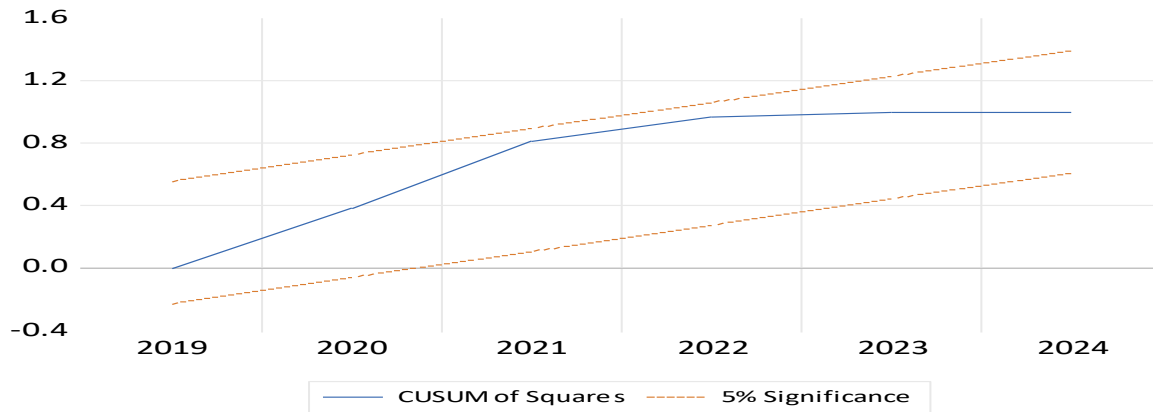


Figure 4. Model Stability Test



Source: output from EViews 12

7. Conclusion and Policy Recommendation

The study aimed to identify the determinants of domestic revenue in Sierra Leone, a country heavily dependent on aid and with low domestic revenue mobilization. Using the ARDL estimation procedure, the study found a long-term relationship among the variables under review. The study found that population growth and total taxes are the main long-term determinants of domestic revenue in Sierra Leone, with all variables having a positive impact, while government expenditure and domestic debt negatively hinder revenue generation. In the short run, domestic debt, inflation, and total taxes also influenced domestic revenue positively, but government expenditure negatively affected it in the short run. While short-term increases in domestic debt and government spending may boost domestic income by boosting economic activity and service delivery, these benefits are short-lived if borrowing and spending are ineffective or poorly managed. Despite growth in real GDP and a rising population, domestic revenue remains limited by narrow tax bases, high informality, and weak compliance. This signals that macroeconomic growth alone is not sufficient and that structural reforms are essential.

Furthermore, the persistent negative impact of government expenditure and domestic debt on revenue in the long run suggests the need for better alignment between fiscal policy objectives, public investment outcomes, and debt sustainability. The tax-to-GDP ratio's positive impact indicates progress in revenue collection, although persistent development is still hampered by regional differences, exemptions, and leakages from the unorganised sector. The study confirmed that short-run disequilibrium to long-run can be corrected at 76% annual speed of adjustment, albeit at a high speed. The diagnostic result showed that 98% of the regressands' variation is explained by the regressors, and the model is free of serial correlation and heteroscedasticity, with stable model coefficients.

One important policy recommendation for the government is to prioritize spending on productive sectors like infrastructure, health, and education to increase public expenditure efficiency and expand the tax base. Strengthen debt management and transparency by limiting domestic borrowing and ensuring funds are directed towards revenue-generating projects. Increase tax compliance and audit effectiveness by investing in real-time monitoring and data matching. Formalize the informal economy by creating simplified tax regimes and

incentives for businesses, offering benefits like microfinance and government services in exchange for registration.

They should also encourage further economic liberalization through signing up to national, regional, and international trade agreements and designing favourable domestic trade policies. The government should formalize the informal sector, expand the tax base, and increase revenue to promote financial inclusion and reduce reliance on specific sectors or commodities, thus enhancing the economy's resilience to external shocks.

Investing in capacity building for tax officials and strengthening public financial management systems is crucial for improving revenue mobilization, increasing transparency and accountability, and increasing citizen trust in tax payment. These strategies can enhance domestic revenue mobilization and promote sustainable economic development. The government should focus on effective expenditure rationalization, robust domestic revenue mobilization, and public financial management. Limiting domestic debt usage is crucial due to its high cost and potential impact on private consumption and investment. Strengthening the reform agenda is necessary to build fiscal buffers and mitigate fiscal risks.

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