



**DEPARTMENT OF ECONOMICS
COLLEGE OF BUSINESS AND ECONOMICS
ADDIS ABABA UNIVERSITY**

**THE EFFECTS OF TAX REFORMS ON REVENUE MOBILIZATION
AND ECONOMIC GROWTH
(THE CASE OF SIERRA LEONE)**

**BY
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**The Effects of Tax Reforms on Revenue Mobilization and Economic Growth
(The case of Sierra Leone)**

By

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**A thesis submitted to the College of Business and Economics, Addis Ababa
University in partial fulfillment of the requirements for the award of Masters
of Science in Economics (Economic Policy Analysis)**

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Certification

This is to certify that the thesis prepared by Ishmail Kamara, titled: *“The Effects of Tax Reforms on Revenue Mobilization and Economic Growth in Sierra Leone”*, and submitted in partial fulfillment of the requirements for the award a degree of Master of Science in Economics (Economic Policy Analysis) complies with the regulations of the University and meets the accepted standards of originality and quality.

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DECLARATION

I, the undersigned, declare that this thesis entitled “*The Effects of Tax Reforms on Revenue Mobilization and Economic Growth in Sierra Leone*” is my original work, prepared under the guidance of Dr. Zerayehu Sime Eshete (Asst. Prof.) All sources of materials used for this thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or full to any other higher learning institution for the purpose of earning any degree.

Name

Signature

Dedication

To the memory of Mr & Mrs Thomas Kamara, Mamusu Kamara, and Ya Haja Nancy Sesay.

May their blessed souls continue to rest in peace!

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Acronyms

AAA	Addis Ababa Action Agenda
AERC	African Economic Research Consortium
ASYCUDA++	Automated System for Customs Data
ATAF	African Tax Administration Forum
CIT	Corporate Income Tax
DTD	Domestic Taxes Department
DTIS	Domestic Taxes Information System
ECOWAS	Economic Community for the West African States
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GST	Goods and Services Tax
IMF	International Monetary Fund
INTrTax	International Trade Taxes
ITAX	Income Taxes
LDCs	Least Developed Countries
LICs	Low-Income Countries
MDGs	Millennium Development Goals
NRA	National Revenue Authority
NRS	National Recovery Strategy
NTR	Non-Tax Revenue
NTRD	Non-Tax Revenue Department
OECD	Organization for Economic Corporation and Development
PIT	Personal Income Tax
RGDP	Real Gross Domestic Product
SDGs	Sustainable Development Goals
TADAT	Tax Administration Diagnostic Assessment Tool
TXR	Tax Revenue
UNCTAD	United Nations Conference for Trade and Development
UNECA	United Nations Economic Commission for Africa
VAT	Value- Added Tax

Table of Contents

Acknowledgments	i
Acronyms	ii
List of Tables	vi
List of Figures	vii
Abstract	viii
CHAPTER ONE	1
1 Introduction	1
1.1 Background of Study	1
1.2 Statement of Problem	4
1.3 Justification of Study	7
1.4 Objective of Study	10
1.5 Research Questions	10
1.6 Scope of Study	10
1.7 Organisation of Study	11
CHAPTER TWO	12
2 Related Literature Review	12
2.1 Theoretical Related Literature Review	12
2.1.1 Theories of Taxation	12
2.1.2 Review of Tax Reforms Literature and Economic Growth Models	18
2.2 Empirical Related Literature Review	20
2.2.1 Review of Studies on Developed Countries	21
2.2.2 Review of Studies on Developing Countries	23
2.2.3 Review of Studies on Sub-Sahara African countries	27
2.2.4 Review of Studies on OECD Countries	30
2.2.5 Review of Studies on Sierra Leone	32
2.3 Conceptual Framework	43
CHAPTER THREE	45
3 Method of the Research	45
3.1 Introduction	45
3.2 Empirical Tests	46

3.2.1. Determination of the stationarity of variables	46
3.3 The ARDL-ECM Bounds Testing Cointegration Approach	48
3.4 Error Correction Model (ECM)	50
3.5 Diagnostic tests conducted	50
3.6 Model Specification	51
3.6.1 Model One: Impact of tax reforms on tax revenue	51
3.6.2 Model Two: Effect of reform induced-tax revenue on the Real GDP	52
3.6.3 Model Three: Effect of tax reform on the different tax handles	54
3.6.3.1 Effect of the tax reform on Income Tax (ITAX)	54
3.6.3.2 Effect of the tax reform on Goods and Services Tax (GST)	55
3.6.3.3 Effect of the tax reform on Non-Tax Revenue (NTR)	56
3.6.3.4 Effect of the tax reform on International Trade Tax (ITrTAX)	58
3.7 Estimation Method	59
3.8 Definition of Variables	60
3.9 Data Source	61
CHAPTER FOUR	62
4. Empirical Results and Analysis	62
4.1 Introduction	62
4.2 Empirical Results	62
4.2.1 Unit Root Tests	62
4.2.2 Lag length criteria determination	66
4.2.3 ARDL/ Bounds Cointegration Tests	68
4.3 Long-run estimates with short-run dynamic coefficients when Tax Revenue is used as a dependent variable based on the ECM	71
4.4 Long-run estimates with short-run dynamic coefficients when real GDP is used as a dependent variable based on the ECM	72
4.5 Long-run estimates with short-run dynamic coefficients when NTR is used as a dependent variable based on the ECM	75
4.6 Short-run estimates when ITAX was used as a dependent variable based on the ARDL...	77
4.7 Short-run estimates when GST was used as a dependent variable based on the ARDL.....	79
4.8 Short-run estimates when LINTrTax was used as a dependent variable based on the ARDL	80

4.5 Analyses/Discussions of findings	83
CHAPTER FIVE	93
5 Summary, Conclusion, and Recommendation	93
5.1 Summary	93
5.2 Conclusion	94
5.3 Recommendation	95
5.4 Limitations of the study	96
5.5 Future direction of research	96
References	97
Appendix	102
Appendix 1: Tax-to-GDP ratio for thirty-three selected Sub-Sahara African Countries	102
Appendix 2: Tax Revenue versus Revised Revenue Targets: 2003-2018	104
Appendix 3: Duty-free concessions/tax exemptions: 2004-2018	105
Appendix 4: Some macroeconomic indicators for Sierra Leone: 1981-2018	106
Appendix 5: Legal and Policy Reforms: 2003-2018	107
Appendix 6: Tax Administration and Systems Reforms: 2003-2018	108
Appendix 7: The employment profile of Sierra Leone: 1991-2018	109
Appendix 8: Tax and Royalty rates in Sierra Leone	110
Appendix 9: The employment profile of Sierra Leone: 1991-2018	111

List of Tables

Table 1: Duty-free exemptions: 2004-2018	38
Table 2: Definition of Variable	60
Table 3: ADF Unit Root Test Result	63
Table 4: Zivot Andrews' Unit Root Test Result	65
Table 5: VAR lag-order selection criteria for Tax Revenue	66
Table 6: VAR lag-order selection criteria for Real GDP	66
Table 7: VAR lag-order selection criteria for ITAX	67
Table 8: VAR lag-order selection criteria for GST	67
Table 9: VAR lag-order selection criteria for NTR	68
Table 10: VAR lag-order selection criteria for INTrTax	68
Table 11: Bounds Test Cointegration Result for Tax Revenue	69
Table 12: Bounds Test Cointegration Result for Real GDP	69
Table 13: Bounds Test Cointegration Result for the respective Tax Handles	70
Table 14: Long-run Estimates with Short-run dynamic coefficients for Tax Revenue	71
Table 15: Long-run Estimates with Short-run dynamic coefficients for Real GDP	73
Table 16: Long-run Estimates with Short-run dynamic coefficients for NTR	76
Table 17: Short-run Estimates for ITAX	78
Table 18: Short-run Estimates for GST	79
Table 19: Short-run Estimates for INTrTax	80
Table 20: Summary of Diagnostic Tests	82
Table 21: Post Estimation Signs	82

List of Figures

Figure 1: The Laffer curve	15
Figure 2: Revenue Mobilisation in Sierra Leone: 1981-2018	35
Figure 3: Total Revenue collected versus Annual Revised Targets:2003-2018	35
Figure 4: Sectoral Contribution to GDP: 2018	39
Figure 5: Sierra Leone's Tax Revenue as a share in GDP: 1981-2018	41
Figure 6: Conceptual framework	44
Figure 7: CUSUM statistic plot for economic growth	75
Figure 8: CUSUM statistic plot for tax handles	81

Abstract

Taxation and tax revenue mobilization in developing countries has attracted global attention and resilience. The fiscal authorities in Sierra Leone introduced series of reforms in the tax system ranging from continual revisions in the tax rates to harmonization and instituting new taxes that are relatively easy to collect. Consequently, tax revenue performance increased significantly by 367 percent but despite this progress, the output of the tax system as measured by the tax-GDP ratio remains very low averaging 11 percent, and has not been able to meet the secondary convergence criteria of the ECOWAS monetary cooperation performance target of 20 percent, thus. With the use of the ARDL-ECM, the study examined the effect of tax reforms on taxation and the impact of the induced-reform tax revenue on the economic growth of Sierra Leone using time series data from 1981 to 2018. Specifically, the results of the study indicate that the tax reforms have indeed in the short-run created some positive effects on the Income Taxes, the Goods and Service Tax, and International Trade Taxes but some negative effects on the non-tax revenue in the long run. Generally, the study concluded that although the tax reforms have not created the much-expected effect on tax revenue in the long run, tax revenue has a significant effect on the economic growth of Sierra Leone. The government intends to mobilize more revenue but tax reforms should be carefully designed with a comprehensive strategy with a periodic review of tax policies ensuring that private-sector investment is given the enabling environment to thrive.

Keywords: Tax Reforms, Tax Revenue, Real GDP

CHAPTER ONE

1 Introduction

1.1 Background of Study

Taxation and tax revenue mobilization in developing countries has attracted global attention and resilience. There is a popular belief that domestic tax revenue must be the basic financing source for government expenditure with foreign aid playing essentially a supporting role, but several developing countries are still grappling with the fundamental need of mobilizing more resources from their tax bases. Eltony (2002), have this to say that budget imbalances and the inefficient use of public expenditures have constrained the critical investments in both human resources and basic infrastructure that are required for sustainable economic growth in some LDCs.

The key reason for tax reforms is to make the tax system simple, neutral, support and promote financial liberalization schemes that will facilitate trade and investment, respond to the global market economy, and enhance the tax revenue - GDP ratio. The United Nations (2005) report indicated that the achievement of the MDGs by low-income countries demands an increased tax revenue of up to 4 percent of GDP. Drummond et al., (2012) opined that mobilizing more revenue is a key for developing countries as they have to finance their development agendas, and weak revenue mobilization is the main cause for fiscal challenges in several developing countries.

Wilford and Wilford (1978) asserted that one of the most critical policies upon which most economists agree is that developing nations must increasingly mobilize their domestic resources to support economic growth. Tanzi and Zee (1997), have also demonstrated that raising domestic revenue is the most feasible way to achieve fiscal sustainability, and the 2010 UNECA report supports the view that the 2008 global financial and economic crisis has shown the need to pay more attention to domestic resource mobilization because the crisis demonstrated the volatility and uncertainty that surround external sources of development finance. As a consequence of these challenges, tax reforms became part of the larger Structural Adjustment Programs (SAPs) instituted by the Bretton Woods Conference which saw many LDCs including Sierra Leone in the last three decades focusing on economic and financial reform programs that included measures to restructure their entire tax system to raise more tax revenues.

The 2005 IMF Report states that tax revenue mobilization has always been a great concern for policymakers in Sierra Leone, and the government has indeed considered the modernization of the tax administration a priority to rebuild the country's economy to make Sierra Leone an emerging economy by 2025. Since then, Sierra Leone's National Revenue Authority has implemented several tax reforms geared towards increasing domestic revenue collection ranging from the frequent upward revisions in the tax rates, harmonization of tariffs, the introduction of new taxes (such as the GST), tax administrative reforms, and autonomous revenue agency among others. As a result of these reforms, revenue collection has grown significantly from 2003 to 2018. In particular, according to the ICTD 2020 figures, net domestic tax revenue collection increased more than threefold, from USD120M in 2003 to approximately USD560M in 2018.

Notwithstanding this progress, revenue performance remains below potential based on tax revenue- GDP ratio. On average, Sierra Leone's tax-to-GDP ratio between 1990 and 2018 is 10.4 percent and has not been able to meet the secondary convergence criteria of the ECOWAS Monetary Cooperation Programme (ECMP) target of 20 percent of GDP. Specifically, however, Sierra Leone's tax to GDP ratio has increased from 11.3 percent in 2003 to 13.7 percent in 2018 despite this, a fiscal imbalance is still increasing because the tax reforms have not been part of a concerted effort to reform the entire tax system but part of the efforts to raise more revenue through budget pronouncements affecting the tax rates or tax brackets as claimed by Kargbo, B.I.B, and Egwaikhide, F.O (2012).

In as much as the government of Sierra Leone wants to catch up with her neighboring partners in enhancing revenue mobilization with a prudent tax system, so also tax authorities should be critically objective when designing and implementing the tax reforms as espoused by N'Yilimon NANTOB (2014) that "although specific tax policy decisions normally are (and should be) effectively discussed and challenged, there is considerable consensus internationally about what are the important tax issues and appropriate tax policy directions for developing countries" (Fjeldstad, 2013). Thus, an effective tax system is considered central for sustainable development because it can mobilize the domestic revenue base as a key mechanism for developing countries to escape from foreign aid or single natural resource dependency. Also, Feldstein (1983,) opined that tax reforms affect economic behavior, and analysis of any change in tax policy should measure the impacts of that change on economic behavior and the economy

as a whole. There is no ultimate tax strategy-mix to stimulate economic growth in developing countries because some countries with high tax burdens have high growth rates and some countries with low tax burdens have low growth rates. To support this assertion, Gordon and Li (2005), opined that “tax policies seen in developing countries are much more puzzling on many dimensions, given the sharp contrast between these policies and both those seen in developed countries and those forecast in the optimal tax literature”.

In general, however, a growth-oriented tax system may need to create as few limitations as possible to the growth of economic activities; but despite the many theoretical and empirical studies as well as policy contestations, no simple and unique answer ever exists concerning the relationship of tax revenue and economic growth nexus. Thus, suggesting difficult and risky tradeoffs will have to be decided when reforming tax systems such that policymakers scale up the different goals the tax system is trying to achieve, and make a balance between the efficiency and objectives of the tax reform with their distributional impact on fairness and equity.

According to Bhartia (2009), “taxation theory may be based on the assumption that there is no relationship between tax paid and benefit recovered from state activities”. However, there is a link between tax liability and tax expenditures because levying taxes to citizens to finance state activities is appropriated evenly in society. Myles (2000) viewed economic growth as being the proximate for increased prosperity but investment in new capital, the implementation of new production techniques, and the introduction of new products are fundamentals of the growth process. Dalibor (2005) argues that past growth literature focused on “Steady- State” growth where output per worker was constant in which Solow (1956) asserted that the “output of a given economy is determined by the size and skills of the workforce and size and productivity of the capital stock”. However, such models were exogenous and allowed for no changes in the long-term growth rates. To assess the effect of factors like taxes on economic growth, therefore, calls for the development of an endogenous model that allows for changes in the growth rates. He furthered that an endogenous model of taxation and economic growth should consider the expenditure side of the government budget if meaningful estimates are to be achieved. Since such exogenous growth could not be affected by taxation, endogenous growth theory was developed and a tool for examining how taxation affects economic growth was formulated. The Harrod-Domar growth theory, for example, stated that advanced capitalist economies attain

steady growth through the accumulation of capital. In this theory, capital investment plays an important role in economic growth because, with the creation of income, the capital stock will be enhanced which will eventually lead to full employment and, in the long run, lead to a productive economy. This assertion can be constrained when government authorities employed contractionary fiscal policies which will hurt private sector investment and lower the availability of capital stock, hence reduces labor demand thereby mitigating economic productivity. In support of this, Ferede and Dahlby (2012) opined that taxes can raise the cost of capital and mitigate incentives to invest to the extent that higher tax rates discourage investment, economic growth will be adversely affected, and the adverse effect of taxes on entrepreneurship reduces the creation of new ideas and lowers total factor productivity. To this end, since the debate on the effectiveness of taxes as a tool for promoting economic growth and development remains inconclusive, it is against this background that this paper focuses to understand the required tax reforms needed to increase domestic revenue mobilization. Specifically, the study investigates the effects of tax reforms on revenue mobilization and the effect of reform-induced tax revenue on the economic growth of Sierra Leone over the period 1981-2018.

1.2 Statement of Problem

A core function of the tax system is to generate sufficient revenue to meet the ever-increasing public expenditures of the state. Nonetheless, most LDCs including Sierra Leone face difficulties in generating revenue. According to Eltony (2002), budget deficits and the unproductive use of public expenditures have constrained the critical investments in both human resources and basic infrastructure that are necessary for sustainable economic growth in some LDCs. The study conducted by Martinez-Vazquez (2001) on tax issues has noted that the level of public expenditure in most developing countries is too low for the physical infrastructure and human capital needs of these countries. In the last three decades, many LDCs have embarked on economic and financial reform programs contained in the larger SAPs that included measures to raise tax revenues and restructure the tax system. LDCs need to rely substantially on domestic revenue mobilization if the MDGs are to be realized within the specified time frame. However, the experience with domestic resource mobilization of developing countries over the last thirty-five years has been mixed. In countries such as Botswana, Israel, Kuwait, and Seychelles, the central government's share of tax revenue in GDP has been more than forty percent, on average,

per annum. Countries such as Argentina, Sierra Leone, Niger, Guatemala, and Burkina Faso have struggled to raise their revenue above eleven percent on annual basis (Gupta, 2007). For macroeconomic stability to be realized, the growth in tax revenue must approximate the growth in public expenditure according to the 1990 World Bank, report. In LDCs, generally, the major taxes tend to have low elasticity and sometimes low buoyancy estimates. This is mainly due to the inherent weakness in the economic structure where a good number of activities remain out of the tax net due to low-income levels and the unorganized nature of most economic activities (Bilquess, 2004).

The government of Sierra Leone's objectives in recent years has been to expand the tax base, increase tax compliance, review exemption lists, strengthen tax administration and procedures, and automate and digitize processes. Various reforms were introduced in the tax system, ranging from frequent upward revisions in the tax rates, harmonization of tariffs, the introduction of new taxes and, a semi-autonomous revenue agency called the National Revenue Authority (NRA). Specifically, since 2003 the NRA had undertaken several tax reforms, despite these reforms, the tax system has faced significant challenges in its efforts to enhance and modernize its financial system and this has led to serious economic and socio-political crises. The economic problem of Sierra Leone started right after the hosting of the OAU Summit in 1980 which saw a downturn in the economy. According to Bangura A., Director, Tax Policy, Ministry of Finance, the economy started experiencing imbalance and a sharp fall in domestic revenue during the 1980s which saw the tax-to-GDP ratio decline drastically by 11 percent from 15 percent in 1980 to 4 percent in 1986.

The problem continues exacerbating between the periods 1997-1999, leading the economy to deteriorate significantly, contracted by 18 percent in 1997, stagnated in 1998, and contracted further by 8.1 percent in 1999. Though nominal revenue increases by 87 percent from Le277 billion to Le2.13 trillion in the first decade of the post-reform era (between 2003 and 2013) but Real GDP growth slowed down to 5.5 percent in 2008 and further decline to 3.2 percent in 2009. The investments in basic infrastructure combined with the recovery in mining and continued expansion of agriculture and services led the economy to recover strongly with real GDP expanding by 5.0 percent but with a lower tax-to-GDP ratio of 9.8 percent relative to the ECOWAS Region of 11.8 percent in 2010 (Ministry of Finance figures).

The 2016 Tax Administration Diagnostic Assessment Tool (TADAT) report claim that the major problems in the tax system can be attributed to the weaknesses in taxpayer registration which is largely due to the lack of risk-based compliance management across registration, filing payment, and audit; and lack of dispute resolution mechanism with non and late filers posing a problem to the tax administration, and these do not only undermine revenue performance but also imposes an undue burden on taxpayers. Besides, the 2017 NRA Taxpayer Perception Survey Report stated that about 90 percent of firms were usually visited by tax officials which do not only disrupt business operations but also pose a corruption risk. Moreover, the highest proportion of these visitations were observed among small taxpayers whose businesses are largely characterized by large informalities, while only around 60 percent of large businesses are visited by tax authorities. To support this assertion, the 2018 World Bank Engagement Note with the government also opined that smaller firms are bearing a disproportionately high burden of compliance with firms operating in Sierra Leone see tax administration and tax rates as more of a problem than firms globally or in Sub-Saharan Africa, and the problems are disproportionately affecting small firms.

2013 Doing Business Report (ranked 88th out of 189 countries) suggests a complex and lengthy compliance procedure of establishing a business, and payment of taxes are some of the key reasons for the weak revenue performance. It requires a large number of payments of about thirty-four (34) mandatory documents to establish and run a business in Sierra Leone, which to a larger extent serves a disincentive to private-sector investment in the country, and hence, exacerbating the challenges of unemployment in the country and by extension revenues collected and economic growth. Coupled with the hegemony being levied by the central governance system in the granting of tax exemptions, Sierra Leone stands out from other countries globally with a high level of informality. To this end, despite the reforms undertaken in the Sierra Leone tax system, it is still faced with significant challenges to improve and simplify its tax administrative operations and modernize its financial system, and this has led to serious economic and socio-political crises.

1.3 Justification of Study

The tax system implies harmony between taxes and the fiscal objectives of the state with tax reform changing the structure of one or more taxes or the entire tax system to improve their functioning for achieving their objectives. Tax reform proposal must have a description of the proposed ideal tax system with clear-cut objectives of economic efficiency, equity, prudent administrative and compliance costs; and transparency, neutrality, simplicity, and stability.

Taxation and economic growth are two major determinants for the development of a country. Even though taxation is the fundamental financing source for the progress of a country; it has negative and positive effects. Most estimates in taxation have a negative effect on the economic growth in LDCs. However, in some cases, it has proven otherwise. It is a truism tax that has a positive effect in advanced economies because of their higher per capita income and GDP than LDCs. On the contrary, the LDCs with a lower living standard with an underdeveloped industrial base, and a low human development index have always shown negative effects on economic growth.

The Sierra Leone economy has raised two critical concerns. One is that is tax reforms the reason for low revenue growth or the reformed induced-tax revenue has contributed to an increase in real GDP. The research approaches these concerns directly or indirectly linked taxes to the economic growth macro data. The growth rates of Sierra Leone are higher during periods when tax revenue increases relative to other factor inputs. In addition, if tax reform policy is used to respond to business-cycle fluctuations, the economic growth could also induce a short-run correlation between tax rates and the growth rate. It tries to avoid any short-run business cycle and focuses on the links between tax rates and average growth rates over the long run.

The researcher tries to find out the effect of tax reforms on tax revenue and the effect of the reformed induced-tax revenue on aggregate economic activity. The general objective is one of the least contested areas in theoretical macroeconomics, neoclassical, and Keynesian theoretical models. For example, studies have been seen the higher taxes reduce economic activity. Even though there is less concession on the exact dynamics of generating this result. However, the issue has not been pursued empirically with anything like the dedication that has characterized the much more vigorously debated effects of taxation policy. The most recent important exception has been studied by Romer and Romer (2007), who construct a novel measure of the

exogenous model consistent with the work of Kenneth Arrow (1962). Because of the negative effect of taxation on GDP growth; LDCs have not given satisfactory results on development. Of course, within a neo-classical framework, in Solow (1970) for example, economic growth simply depends on the accumulation of capital and labor, so that the existing empirical work studying tax effects in investment and labor supply does not factor the relevant effects on growth. In this framework, however, there would be no effects of changes in the development of total factor productivity. The more recent literature on endogenous growth, however, suggests that positive externalities are omitted from the traditional neo-classical framework.

According to Venanzi, over the years, Sierra Leone has depended largely on the revenue coming from the mining and agriculture sectors to the utter neglect of other domestic sources of revenue. Out of these; taxes contribute a significant amount in the public revenues, and the government mobilizes revenues through the budget in development activities for the public welfare and interests, but the per capita income is still low and more than one-third of the people are living below the poverty line. The economic development and prosperity are very low, external dependency and internal leakages have made the government through tax reforms to think of other options which are expected to enhance domestic revenue. Moreover, the fiscal deficit has been increasing due to the ever-increasing expenditure and the low revenue performance. The budget has highly resource gap because the expenditure is higher than revenue and foreign aid combine. The gap is being fulfilled by internal and external loans, which is the main economic problem. The tax and non-tax revenue is the major source of the internal revenue where tax revenue is playing a more vital role than non-tax revenue.

The experiences of the developed countries indicate that income tax may be one of the major sources for the incremental level of internal revenue but in developing countries like Sierra Leone, its contribution has not increased significantly during the long period. As mentioned above, there is a significant resource gap in this area, and the gap between income and expenditure is increasing steadily. Even though the government is trying to tight the taxes, the gap has not been changed. The serious problem is the same in the process of economic development, though it is very necessary to raise its resource revenue but on the other hand, Sierra Leone's tax rate causing low economic growth despite the tax reforms.

To all that said, the researcher considers essentially the simplicity of the tax structure since it is clear that complex tax systems favor evasion and avoidance, and may create uncertainty about the scope of tax rules, raise the costs of control, increase compliance costs and multiply the mechanisms of tax evasion and tax avoidance. Modern technologies, without hesitation, are a great ally for the simplicity of the tax structure, and the researcher believed that technology can simplify taxes by reducing compliance costs for taxpayers and system administration costs. A very important role in simplification is to have broad-based taxes, single quotas, and very few preferential treatments such as tax exemptions or exceptions.

One of the seven actions adopted under the Addis Ababa Action (AAA) Agenda in 2015 calls on African countries to mobilize more revenues domestically to finance their expenditures. The underlying rationale is that these additional resources when supplemented with the limited foreign aid, would help finance the SDGs by 2030. According to Gupta S. et al., 2019, on average, low-income countries (LICs) will require extra resources up to about 15.4 percent of GDP to finance the SDGs in education, health, roads, electricity, and water by 2030 but the required extra financing of about 5 percent of GDP would have to come from domestic taxes. It is against this background that motivated the curiosity of the researcher to do a study on tax reforms.

From the empirical literature in this paper, it was evident that a limited number of studies looked at an appraisal of the major tax reforms undertaken by the government and their effect on economic growth in Sierra Leone and this is the essence of this study. The effect of tax administration and revenue generated on economic growth in Sierra Leone has been investigated in prior research studies. However, different factors have been used to measure the tax administration concerning the tax revenue generated. The few existing literatures examined the effect of individual tax handles on economic growth. For example, Kargbo and Festus (2012), and Bangura Alpha B. (2020) failed to explain the types of tax reforms undertaken by the Sierra Leone government and the effects these tax reforms have on tax revenues and by extension to the economic growth of the country; rather focusing on the buoyance of the respective tax handles to revenue mobilization. Coupled with the reason(s) as to why the Sierra Leone tax revenue share in GDP is below potential, this paper captured the most significant tax reform ever undertaken by the government of Sierra Leone, and its effects on revenue mobilization and economic growth of

the country covering the period 1981 to 2018. Besides, it also urged me to probe into such researches with the view of coming up with useful findings and recommendations that would be of importance to the fiscal policymakers.

1.4 Objective of Study

The general objective of the study is to investigate the effect of tax reforms on economic growth in Sierra Leone.

The Specific objectives are to investigate among others:

- a) The effect of tax reforms on tax revenue in Sierra Leone; and
- b) The effect of reform induced-tax revenue on the economic growth of Sierra Leone.

1.5 Research Questions

The following research questions among others are important for consideration:

- a) To what extent have the Sierra Leone tax administrative reform programs affected the revenue growth of the country?
- b) Does reform induce tax revenue performance increases economic growth?

1.6 Scope of Study

The fact that the Sierra Leone tax system has undergone several tax reform programs since independence, total revenues collected after the reforms indicates a boost in revenue mobilization and, indeed, the country has presented an increase in its tax collection mobilization but with a decreasing tax-to-GDP ratio. The paper, therefore, concentrated on the Sierra Leone tax system and its effects on the economy to cover a thirty-eight (38) year period ranging from 1981 to 2018 inclusively. This period makes provision for analysis before and after the formation of the NRA but the study focused only on those tax reform programs implemented since the inception of the National Revenue Authority (NRA) in 2002 because an overhaul of the tax reform measures only took place during and after the consolidation of Revenue Collection Agencies into one Revenue Authority, the NRA.

1.7 Organisation of Study

The rest of the study is organized into four chapters. Following the Introductory Chapter, Chapter Two broadly focuses on the related literature including an overview of the Sierra Leone Tax system, the economy, and the governance mechanism with its impact on revenue mobilization. The method of research is discussed in Chapter Three. The Empirical results, analyses are discussed in Chapter Four. While Chapter Five consists of the conclusion, summary and, policy recommendations where possible.

CHAPTER TWO

2 Related Literature Review

Tax reforms have been seen as a very important determinant in helping governments achieving their goals including economic growth and sustainable development. The various theoretical and empirical literature on taxation have asserted that tax reforms should be efficient and effective, equitable, and fair to all taxpayers and that the fiscal authorities should be transparent and accountable to their taxpayers.

This aspect of the study is devoted to relevant related literature reviews and it is divided into two main sections: the Theoretical Related Literature Review; and the Empirical Related Literature Review. While the former presents relevant theoretical work, the latter provides a brief empirical review based on similar researches relating to tax administrative reforms as observed by other previous researchers.

2.1 Theoretical Related Literature Review

2.1.1 Theories of Taxation

The quest for an optimal tax rate where tax revenues are maximized for social welfare and economic growth has been the very essence of the various several theories underpinning the concept of taxation. Most Economists have postulated many theories at different eras to guide governments on how equity can be achieved in taxation. However, there is a common phenomenon amongst these theorists that taxation as a means of sustaining government fiscal space should not seem to compromise the factors of production (land and capital) in funding government activities because if a tax affects the price of an accumulated factor of production then this tax is distortionary. Below is a list of some theories of taxation:

2.1.1.1 The ‘Ability to Pay’ Theory

The ‘Ability to pay’ theory can be attributed to several sources, but scholars tend to point to Adam Smith, who said that individuals “ought to contribute towards the support of the government, as nearly as possible, in proportion to their respective abilities”. The ability to pay is compelling because it encapsulates numerous theories of equity, including the utilitarian notion of “equal sacrifice”. This principle requires that the total tax burden will be distributed among

individuals according to their capacity to bear it, taking into account all of the relevant personal characteristics. Pigou (1920) suggested that every citizen should pay taxes according to his ability to pay, to meet the cost of Government expenditure. The Ability to pay theory of taxation is similar to the “*principle of equity or justice*” in taxation which believes that people with higher incomes should pay more taxes than people with lower incomes, thus ‘no quid pro quo’ subsist.

This theory satisfies two branches of equity: horizontal and vertical. Horizontal equity holds that like persons should be treated alike, implying that two people with the same ability to pay should not contribute different amounts simply because the respective sources of their ability to pay are different. Vertical equity holds that non-like persons should be taxed appropriately differently. In other words, a person with few resources should be required to contribute less, even on a proportional basis, than a person with many resources at her disposal.

However, the major drawback inherent in this theory is the definition of one’s ability to pay, and there have been some controversial views against this theory. John Locke and Thomas Hobbes, for example, believed that equity should be measured by what is spent rather than by what is earned; modern advocates of consumption-based taxation emphasize the neutrality of consumption-based taxes toward saving, the simplicity of consumption-based taxes, and the superiority of consumption as a measure of an individual’s ability to pay over a lifetime. Some theorists believe that wealth provides a good measure of the ability to pay because assets imply some degree of satisfaction and tax capacity, even if they generate no tangible income. Also, horizontal equity would be violated if a set amount of earnings from wages attracted a higher tax than the same amount of earnings from trust fund investments.

2.1.1.2 The Benefits Theory

The Benefits theory posits that people should contribute to the government according to the benefits they receive from it. According to Cooper (1994), taxes are to be imposed on individuals according to the benefit conferred on them. Also, John Locke asserted that governments cannot be supported without great charge, and it is fit everyone who enjoys his share of the protection should pay out of his estate his proportion for the maintenance of it. In effect, the more benefits a person derives from the activities of the State, the more he should pay to the government, thus a “quid pro quo” is expected to subsist. This is a compelling idea, grounded in the belief that

societies form to engage in shared projects, and governments' main role, perhaps especially in a democratic state, should be that of aggregator of preferences

However, there are some apparent shortcomings associated with the Benefit theory. Firstly, it is impossible to be implemented precisely due to the difficulty of determining the number of government benefits, including diffuse benefits such as military protection received by each resident and non-resident taxpayer. Secondly, it is difficult or almost impossible to accurately measure the value of non-cash transfers to individuals, especially when they are intangible or difficult to disaggregate, such as clean air or a corruption-free legislature. Thirdly, it can be socially or economically difficult to collect payment or to exclude certain benefits from people without the means to pay, for example, the poor, the young, the old, etc... Finally, when as a matter of policy to reduce economic inequality, for example, the government intentionally seeks to transfer wealth from one person or group of persons to another or to subsidize a particular activity, "taxation according to benefit is a sheer contradiction".

2.1.1.3 The 'Cost of Service' Theory

The contra theory to the Benefit theory is the 'Cost of service' theory of taxation which suggests that the government should tax the citizens according to the cost of service rendered by it. The tax an individual should bear must be equal to the cost of benefit receives that is, cost-benefit analysis.

2.1.1.4 The Sacrifice Theory

This theory was championed by Makinya (2000), according to the Sacrifice theory, payment of tax is a sacrifice that an individual makes towards the support of the government. This theory attempts to determine the burden that rests upon an individual in virtue of his or her payment of taxes and how much of his or her income remains for purpose of his subsistence

2.1.1.5 The Laffer curve Theory

In his book titled "Government exactions and revenue deficiencies", Arthur Laffer (1981) opined that for every type of tax, there is a threshold rate above which the incentive to produce more diminishes, thereby reducing the amount of revenue the government receives. If this effect is large enough, it means that at some tax rate, and a further increase in the rate will lead to a decrease in total tax revenue.

Arthur Laffer claims that tax revenue is zero if the tax rate is either zero or 100 percent, but as tax rates increase from low levels, tax revenue collected by the government also increases. Eventually, if tax rates reached 100 percent, all people would decide not to work because everything they earned would go to the government. Therefore it is necessarily true that at some point in the range where tax revenue is positive, it must reach a maximum point T^* as shown on the Laffer curve below. To the left of T^* , an increase in tax rate raises more revenue than is lost to offsetting worker and investor behavior. Increasing rates beyond T^* however, would cause people not to work as much or not at all, thereby reducing total tax revenue.

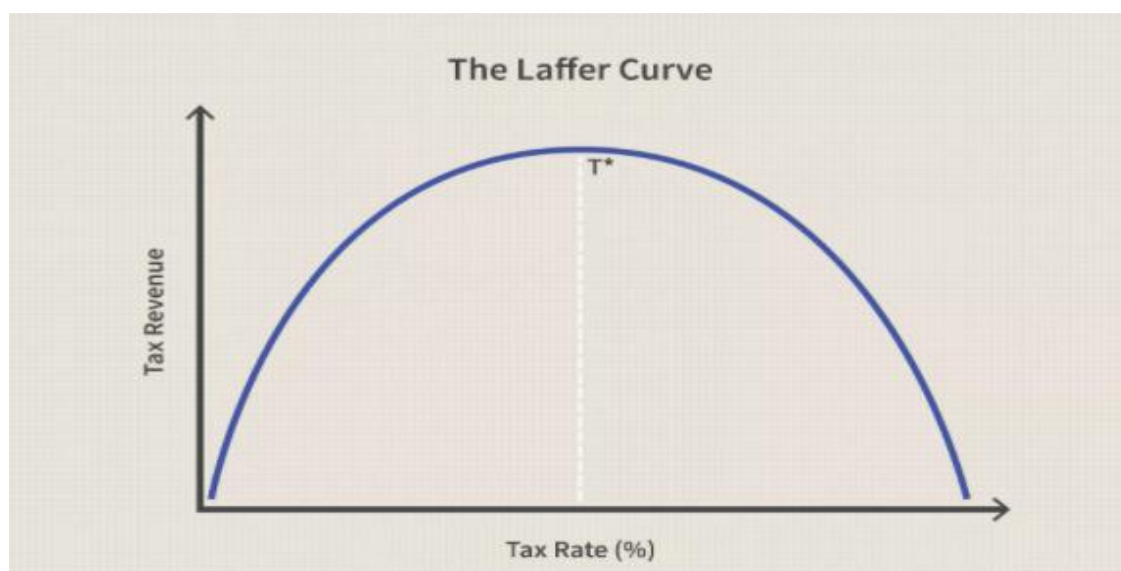


Figure 1: The Laffer curve

At any tax rate to the right of T^* , a reduction in tax rate will increase total revenue. Hence, governments would like to be at point T^* because it is the point at which the government collects the maximum amount of tax revenue while people continue to work hard. If the current tax rate is to the right of T^* , then lowering the tax rate will both stimulate economic growth by increasing incentives to work and invest, and increase government revenue because more work and investment means a larger tax base.

Some fundamental problem associated with the Laffer curve is that it is far too simplistic in its assumptions. First, the optimal tax revenue-maximizing tax rate T^* is unique and static, or at least stable. Second that the shape of the Laffer curve, at least in the vicinity of the current tax

rate and T^* is known or even knowable to policymakers. Lastly, that maximizing or even increasing tax revenue is a desirable policy goal.

Also, some supply-siders contend Arthur Laffer's position and opined that for his proposition to be correct, compensated elasticities of substitution would have to be sufficiently high because many of the tax rates currently in force in many countries are very high. Besides, in the real world, workers may be tied to contracts, if tax rates go up, many workers may not have the luxury of deciding to work less. As a recommendation, Fullerton and Don (2008) suggest a marginal income tax rate of 70 percent to be considered an optimal level at which the Laffer curve effect may start to occur. In other words, if income tax rates are 80 percent and they are cut to 70 percent, the incentive effect may increase total tax revenue. However, having a higher rate of income tax of 50 percent, then cutting tax rates will not of themselves lead to an increase in working hours and tax revenue.

2.1.1.6 The “Trickle-down” Theory

The “trickle-down theory,” asserts that tax breaks and benefits for corporations and the wealthy will trickle down to everyone else. It argues for income and capital gains tax breaks or other financial benefits to large businesses, investors, and entrepreneurs to stimulate economic growth. With the Trickle-down theory of taxation, supply-siders believe that less regulation, tax cuts for corporations, and high-income earners would incentivize companies and the wealthy to raise output and create better jobs, whilst the demand-siders believe in subsidies and tariffs, whereby the wealthy need protections to keep paying their employees or to raise spending.

2.1.1.7 Tobin's q Investment theory and Taxation

Tobin's q theory illustrates cases in which tax changes can have opposite effects on the stock market and investment and demonstrate the importance of taking tax reforms into account in estimating relations between market valuation and investment. The essential insight underlying Tobin's theory is that, in a taxless world, firms invest as long as each dollar spent in purchasing capital raises the market value of the firm by more than one dollar. According to Tobin's approximation, the market value of an additional unit of capital equals the average market value of the existing capital stock that is, average q .

Therefore, introducing the tax component on Tobin's q theory on the effective purchase price of new capital goods directly reduces the real acquisition cost of new capital goods. An increase in the corporate tax rate, for example, has an ambiguous effect on long-run capital accumulation which will reduce the dividend, and capital stock will be negatively affected because of the expensing of adjustment costs and the increased value of the tax deduction for depreciation. Hence, in the tax reform agenda, policymakers should develop efficient and effective tax rates that will incentives potential private-sector investment into the country.

2.1.1.8 The Classical versus the Keynesian schools of thought on taxation

The Classical school of thought saw the economy as free-flowing, with prices and wages freely adjusting to the fluctuations of the economy over time. Classicalists believed in the non-intervention of government and the economic independence of the individual. They believed in economic flexibility and portrayed the economy as self-correcting, self-adjusting, and ensuring full employment. However, the Keynesians questioned the validity of the self-adjusting and self-correcting economy as portrayed by classical theory. They believed that the only way out for the survival of the economy was for the government to have the power to tax, borrows, and put money into private-sector and get demand for goods and services that stimulate economic growth and stability.

2.1.1.9 The Arithmetic and Economic Effect Theory

This theory was propagated by Ibn Khaldun (1332 to 1406) as espoused by Islahi (2006), and it seeks to stipulate a given rate of the tax at which a given amount of government revenue can be raised, with minimum distortion in the economy. According to Khaldun, the two effects have unmatched results on revenue when tax rates are either increased or decreased. With the arithmetic effect, if tax rates are lowered, tax revenues will be lowered by the amount of the decrease in the rate and vice versa. The economic effect, however, proposed that a lower tax rate positively impacts work, output, and employment. However, Ibn Khaldun's proposition is validated by the optimum tax theory propounded by Mirrlees (1971).

2.1.1.10 The Optimal Theory of Taxation

Much of the literature on this theory is credited to James Mirrlees (1971), this theory suggests that the social planner's goal is to choose the tax system that maximizes consumers' welfare,

knowing that consumers will respond to whatever incentives the tax system provides. Mirrlees' approach formalizes the classic tradeoff between equality and efficiency that real governments face, and it allows the social planner to consider all feasible tax systems. In the most basic version of his model, individuals differ in their innate ability to earn income. The planner can observe income, which depends on both ability and effort, but can neither observe ability nor effort directly. If the planner taxes income in an attempt to tax those of high ability, individuals will be discouraged from exerting as much effort to earn that income.

According to James Mirrlees, the optimal tax problem is a game of imperfect information that often relies on the "revelation principle" between taxpayers and the social planner. The social planner has to make sure the tax system provides sufficient incentive for high-ability taxpayers to keep producing at the high levels that correspond to their ability, even though the social planner would like to target this group with higher taxes. However, the weakness in the Mirrleesian approach is its high level of complexity because keeping track of the incentive-compatibility constraints required so that individuals do not produce as if they had lower levels of ability makes the optimal tax problem much harder.

2.1.2 Review of Tax Reforms Literature and Economic Growth Models

Tax reforms in developing countries are strongly influenced by their economic structure, and most of the discussion on the relationship between reforms in the tax structure and economic performance focuses on the effects on GDP levels. In practice, however, it may be difficult to distinguish between effects on tax reforms and growth rates. Indeed, any policy that raises the level of GDP will increase the growth rate of GDP. Also, transitional growth may be long-lasting, and so it has not proved possible to distinguish effects on long-run growth from transitional growth effects, although some elements of the tax system are likely to have a bearing on long-run growth.

According to Bhartia (2009), "taxation theory may be based on the assumption that there is no relationship between tax paid and benefit recovered from state activities". However, there is a link between tax liability and tax expenditures because levying taxes to citizens to finance state activities is appropriated evenly in society. Myles (2000) in his work "taxation and economic growth" viewed economic growth as being the proximate for increased prosperity but investment

in new capital, the implementation of new production techniques, and the introduction of new products are fundamentals of the growth process.

Dalibor (2005) argues that past growth literature focused on “Steady- State” growth where output per worker was constant in which Solow (1956) for example, asserted that the “output of a given economy is determined by the size and skills of the workforce and size and productivity of the capital stock”. However, such models were exogenous and allowed for no changes in the long-term growth rates. To assess the effect of factors like taxes on economic growth, therefore, calls for the development of an endogenous model that allows for changes in the growth rates.

Dalibor (2005) furthered that an endogenous model of taxation and economic growth should consider the expenditure side of the government budget if meaningful estimates are to be achieved. Since such exogenous growth could not be affected by taxation, endogenous growth theory was developed and a tool for examining how taxation affects economic growth was formulated. The Harrod-Domar growth theory, for example, stated that advanced capitalist economies attain steady growth through the accumulation of capital. In this theory, capital investment plays an important role in economic growth because, with the creation of income, the capital stock will be enhanced which will eventually lead to full employment and, in the long run, lead to a productive economy.

This assertion can be constrained when government authorities employed contractionary fiscal policies which will hurt private sector investment and lower the availability of capital stock, hence reduces labor demand thereby mitigating economic productivity. In support of this, Ferede and Dahlby (2012) opined that taxes can raise the cost of capital and mitigate incentives to invest to the extent that higher tax rates discourage investment, economic growth will be adversely affected, and the adverse effect of taxes on entrepreneurship reduces the creation of new ideas and lowers total factor productivity. Recognizing this, over the past decades many LDCs countries including Sierra Leone have undertaken several structural reforms in their tax systems aiming to reduce tax rates and base broadening to enhance efficiency, while simultaneously maintain tax revenues.

The theoretical tax burden literature argues that if a tax affects the price of an accumulated factor of production then this tax is distortionary. According to Mureşan et al., (2014), an increase in

distortionary taxation discourages the economic activities and consequently lowers the growth rate of economic output, and, simultaneously a high VAT rate constraints the possibility of consumption and investment, generates negative effects on the supply and the demand of commodities. According to Bumpei, (2011), a change in the VAT rate has a substitution effect, implying that a decrease in the income tax rate to offset the reduction in consumers' income due to the increase of the VAT rate will lead to a change in aggregate consumption. However, Owolabi and Okwu (2011) held a contrary view claiming that VAT revenue contributed positively to the development of the respective sectors, but Adereti et al. (2011) was suggestive that though a positive correlation exists between VAT revenue and domestic investment, there is no evidence of causality between the two variables.

Generally, revenue growth slows during economic recessions and accelerates during expansions so also revenue elasticity tends to increase in expansions and reduces in recessions, thus exacerbating the volatility of revenue flows. The elasticity of the corporate income tax, for example, is particularly volatile because, in a recession, corporate profits fall much more precipitously than overall economic growth. Countries like Sierra Leone for example that depend heavily on natural resources taxation are especially vulnerable to cyclical swings, with wide swings in commodity prices changing the level of tax revenues as experienced in the twin shock of the Ebola and the fall in commodity prices globally in 2014. However, a country that relies on a balanced set of tax instruments rather than a single revenue source will have lower tax revenue volatility, just as an individual investor can reduce the volatility of her investment portfolio by adopting a diversified investment strategy.

2.2 Empirical Related Literature Review

Empirical studies on the tax revenue and economic growth relationship have arrived at different outcomes. While a fraction agrees that an inverse relationship exists between tax revenue and economic growth, others found a direct relationship to exist between tax revenue and economic growth. Some contend that tax revenue has mixed relationships with economic growth.

The conflicting nature of these findings may be as a result of the different definitions of state in different countries and periods, the problems in measuring tax variables, the difficulties in sorting out the impact of individual tax components on growth, because of the complex interactions of fiscal variables only, and, the lack of empirical data enabling acceptance or

rejection of some theoretical theses. Below are lists of some empirical reviews consistent with this paper:

2.2.1 Review of Studies on Developed Countries

Even though the tax is good for the growth of the economy, the short-term reduction in economic growth reduces the size of the economy permanently. In support of this, Tomljanovich (2004) opined that higher taxes in the United States reduce short-term growth rates but do not affect growth rates in the long term. The breakdown of the total tax burden reveals that income tax, property tax, and sales taxes have no significant effects on economic growth, while corporate taxes have significant effects on growth. Comparing the growth in 48 neighboring countries in the United States and controlling for the average state tax rate, the highest State marginal income tax rate, and other factors, Holcombe and Lacombe (2004) findings reveals that the States that raised their income tax rates more than their neighbors had slower income growth. The results show that an increase of 13.3 percent in marginal tax rate will reduce per capita income by about \$377 after thirty 30 years. Interpolating the result linearly, an increase in the tax rate would ultimately reduce the growth rate by 0.01 percent annually.

Goff, et al (2012), match adjacent pairs of States-based either on location or, for States in the middle two quartiles of the respective distributions, based on population or land size ratio, scrutinize the effects of tax revenues on per capita Gross State Product (GSP) growth to show that higher tax burden reduces cumulative nominal GSP per capita growth by about 2 percent. When Income Tax and Corporate Tax revenues were employed as separate variables, it was discovered that the relationship between corporate taxes and Economic Growth is not statistically significant and that the marginal impact of higher individual Income Tax burdens is only about 20 percent of the impact of overall revenues.

Engen and Jonathan (1996) re-examined the relationship between economic growth and taxation in light of the accumulated economic evidence in the United States and other countries and concluded that there is no enough evidence to significantly say that high taxes are bad for economic growth, theoretically and empirically. The evidence is however align with lower taxes having modest positive effects on economic growth.

Padovano and Galli (2001) also constructed similar tax measures and included a dummy to allow for modification in tax rates over time. It was found that the relationship between tax and the growth of the economy is statistically significant, which confirms that marginal tax rates and economic growth have a negative relationship. Gwartney and Lawson (2006) indicated that high marginal tax rates, particularly rates of 50 percent or more, exert an adverse impact on long-term growth. It was estimated that a reduction in a country's top marginal tax rate by 10 percent increases long-term annual growth by approximately 0.3 percent.

Bania et al. (2007), concluded that the relationship between economic growth and taxes should be quadratic and depend on spending. They uncover a positive linear effect and a negative quadratic effect of tax revenue on growth, with the growth effect hitting zero when revenues reach about 29 percent of personal income. Besides, Stockey and Rebelo (1995) found out that tax reforms have very minor implications for economic outcomes. Ojede and Yamarik (2012) did not find any kind of impact of income taxes on growth in these States. Their findings indicate that Property and Sales Tax has detrimental consequences on development. Barro and Redlick (2009) find that average marginal income taxes were halting economic growth. Ljungqvist and Smolyansky (2016) came up with the main conclusion that a rise in corporate tax is not good for employment and income and has very little impact on economic activity.

Using univariate income tax revenue time-series analysis to evaluate the Kennedy tax cuts in 1981, Canto, Joines, and Laffer, researched the US Income Tax system, they found out that their time-series estimates showed smaller revenue losses than those predicted at the time by the U.S. Treasury. Taking an alternative approach to the evaluation of the Kennedy tax cuts, Fullerton (1982) used an empirical U.S. general equilibrium model to plot the Laffer curve for various elasticity values of factor supply in the United States. He concluded that, although Laffer's effects were conceivable in the context of the U.S. income tax system, they were unlikely given the conventional wisdom concerning the relevant elasticities of labor supply.

Mackenzie modeled the effects of a tax reduction on aggregate supply within the context of a simple macroeconomic model and found the aggregate demand effects to be more pronounced than the aggregate supply effects. Grierson and others (1977) reported a more positive result. They found the possibility of an inverse relationship between tax rates and tax revenue for local government in New York. This finding lends support to the hypothesis that Laffer effects are

likely to be most pronounced where the tax base is narrowly defined, and substitution possibilities are thus increased. Stuart (1981) used a two-sector model with parameter values to fit Sweden, he found that the peak of the Laffer curve occurs at a marginal tax rate of approximately 70 percent. This result can be contrasted with actual marginal tax rates in force in Sweden as rates as high as 80 percent, and he concluded that tax rate reductions were in order.

It is a truism that where all other factors are equal, a company would want to avoid paying unnecessary taxes. According to Klemm & Van Parys, (2009), tax rates, together with other tax incentives are often used as an advantageous strategy for creating competitive tax policies. Bolnick (2004) supported this view that the use of lower tax rates as an incentive is also fairly simple from an administrative view. Several studies have confirmed a negative relationship do exists between corporate income tax rates and FDI inflow. For example, to assess the impact of changes in tax rates on FDIs in Australia and the USA years, Wijeweera and Mounter (2007) found out that a reduction in tax rates leads to an increased level of FDI in Australia and a one percent increase in corporate tax rates leads to a one percent decline in FDI inflow for the United States. Hines (2010) also established that on average, FDI increased by two percent for every one percent reduction in the corporate tax rate.

One may assert that investors naturally take into consideration corporate tax rates in planning where to establish an investment with a more comprehensive assessment of what is factored in the term “corporate tax rate” as espoused by Bolnick (2004) in which he claims that “the main negative impact related to decreasing the corporate tax rate to attract new investments, is that the benefit of reduced tax rates is enjoyed by all parties even in the absence of additional investment”. This therefore may lead to a decrease in tax revenues should it not be combined with the implementation of other measures to increase the tax base that generates revenues.

2.2.2 Review of Studies on Developing Countries

Simplified laws modernize and streamline processes and procedures for the various functions of tax administration consistent with one of the findings stressed in Bird’s (2004) detailed review on developing economies. According to Bird (2004), tax administration is more effective if the tax laws are simplified, and the underlying goal of modern processes and procedures should be to collect the right amount of taxes, as specified by the law, with the minimum amount of taxpayer compliance cost. As documented by Kahn, Thornton, and Frazier (2000), the second finding in

the literature on tax reforms is to develop carefully a comprehensive strategy before undertaking the tax reforms. It is crucial to phase in the reforms sequentially from obtaining an incremental change, consolidate that change, and using the momentum from that success to produce future changes. The third and most essential lesson in the literature is that all levels of government of developing economies must exhibit a strong political will to modernize the tax administration. If the political will is not present the probability of successful tax reform drops dramatically, even if the tax structure has been simplified and a comprehensive strategy has been designed.

Taliercio (2003), employed a regression model based on survey data from randomly selected large corporate taxpayers in four Latin American countries. Measuring credibility as the respondents' perception of organizational performance the results supported his hypothesis that politicians must create a credible commitment to taxpayers that the reformed tax administration will be more professional and fair in its dealing with taxpayers. The argument is that politicians are tempted to be inconsistent over time with certain policies.

Base on a regression model with data from 86 developing countries, Fauvelle Aymar's (1999) studies reveal that credibility significantly affects the level of tax collection. Her measure of government credibility was the volatility of inflation. She concluded that if taxpayers increase their compliance because they perceive a rise in the probability of detecting evasion, then the policy objective is achieved. But politicians, having achieved the policy objective in the short run, now have incentives to allocate resources elsewhere, and this reallocation could likely include giving tax holidays to supporters, thus reducing tax revenues; or eroding the budget of the tax agency, which is particularly problematic if inflation reduces the salaries of tax officials. The basic problem is that sustaining as well introducing tax reform creates costs from the politicians' perspective.

Recent studies by Skinner, 1988; Easterly and Robelo, 1993; Padda and Akram, 2009; Worlu and Emeka, 2012; Bujang et al., 2013; Canavire-Bacarreza et al., 2013 analyzed the empirical effects of taxes on economic growth in developing countries and they obtained nonconsensual clear results as the theory suggests. According to N'Yilimon Nantob (2014), Skinner (1988) used data from African countries to conclude that income, corporate, and import taxation led to greater reductions in output growth than average export and sales taxation. Easterly and Robelo (1993) use a growth model and sample that includes thirty-two developing countries to

experiment with a method of obtaining average marginal income tax rates that combines information on statutory rates with the amount of tax revenue collected and with data on income distribution. As expected, there is a positive correlation between their income weighted average marginal tax rates and the level of real per capita income. This simply reflects the fact that developed economies tend to rely more on income taxes than developing countries.

Padda and Akram (2009) test whether tax policies conducted by Pakistan, India, and Sri Lanka have a transitory or permanent effect on their economic growth over the period 1973– 2008 and they find that the impact of tax rate changes is transitory and negative for short-term in Pakistan and India but Sri Lanka is positive for the first year and thereafter it has also a negative effect on economic growth.

To examine the impact of tax revenue on the economic growth of Nigeria looking at its impact on infrastructural development from 1980 to 2007, Worlu and Emeka (2012) find that tax revenue stimulates economic growth through infrastructural development. Using the Error Correction Model, Mdanat et al. (2018) find for Jordan that income tax, corporation tax, and personal tax negatively impact growth. They suggest that irrespective of tax collection, the prime focus of the government should be the social justice of the people. Dladla and Khobai (2018) also find similar results for South Africa where income taxes are coming out to be negative. For the case of Italy, Federici and Parisi (2015) used the 880 firms' data and results show that corporation tax is bad for investments with the consideration of both effective average and marginal tax rates.

However, with the use of the VAR technique estimation, Canavire-Bacarreza et al. (2013) came up with a contrary view in evaluating the impact of the most important tax instruments of Latin American countries. Their results suggest that, for the most part, personal income tax does not have the expected negative effect on economic growth in Latin America. They also find small negative effects of corporate income tax on growth for individual countries, specifically Argentina, Mexico, and Chile. Finally, their results suggest that greater reliance on consumption taxes has significant positive effects on growth in Latin American in general.

The adoption of a progressive system of taxation by developing countries has resulted in a major source of disincentives and tax evasion. This, therefore, calls for developing countries to effectively reduce their tax rates to attract investment that will stimulate economic growth.

Wanniski (1983) utilizes the income tax information and in his discussion of the effects of tax policy changes in India and ascribed the “extraordinary quiescence” that descended on India, after a period of political turmoil, to the tax changes introduced in 1975. These tax changes according to Wanniski (1973) were very much in the supply-side model in that they involved reductions in the highest marginal income tax rates 85 percent to 77 percent, corporate tax rates, and wealth tax rates. Further rate reductions and bracket changes were made in April 1976 as a result of unexpected revenue buoyancy. These, in turn, it is argued, stimulated even more dramatic economic growth. As implied, the trouble with this type of reasoning is that it is suggestive but perhaps overly simplistic. Kwon (1984) examined the case of Korea working at an aggregate level, he concluded that the behavior of tax revenues over time as tax rates were increased is not inconsistent with the existence of a Laffer curve. However, he also concluded that Korean income tax rates do not appear to be such as to have placed Korea over the Laffer “hill.”

Utilizing an unrestricted Error Correction Model proposed by Pesaran and Shin (1977) to examine the tax policy and its effects on macroeconomic activities in Barbados, Greenidge, and Drakes (2009) study suggests that total and indirect taxation has a contractionary effect on the economy in the short-run with no long-run impact, while direct taxation harmed growth in both the short-run and long-run. These findings were consistent with the study conducted by Koester and Kormendi (1989) who observed that tax rates seem to harm economic growth, with marginal tax rates harming the level of activity.

A variety of studies with inconsistent findings have been performed to discuss the nexus between taxation and FDI. Barlow and Wender (1955) for example, found that taxation is not a significant determinant of investment decisions. Their view was further supported by the findings of Morisset & Pirnia, (1999). However, in 1996 Hines (1996) held a contrary view that taxation could significantly affect the actions of transnational corporations and thereby causing increased FDI inflows. Hines' findings were confirmed by a study conducted by Wei (1997). Kransdorff (2010) argued that tax policies do play a role in attracting FDI in certain circumstances in developing countries. Kransdorff's (2010) claim was supported by a study performed by Dethier and Madiès (2010) in determining the tax policy's responsiveness to FDI inflows in developing countries. According to their findings, developing countries' FDI inflows tend to be responsive to tax policies though with varying degrees. They furthered that tax

holidays are critical incentives in inducing FDI in developing countries. Using UNCTAD's FDI Potential Index, Kransdorff (2010) performed a study to compare South Africa's tax policies with Brazil. His findings reveal that South Africa does not offer a large variety of tax inducements which has the potential to discourage foreign investors and thereby perform on a sufficient scale in the world market.

There are various costs associated with collecting taxes, developing countries with scarce resources, therefore, need to adopt tax policies to help ensure that those resources are used as efficiently as possible in collecting taxes. Compliance costs, for example, are generally quite regressively distributed and are typically much higher than taxes collected from smaller firms. Although the measurement of compliance costs is still in its rudimentary stage, there are a few studies that estimate compliance costs. According to Mann (2005), in Guatemala, it is estimated at 2.5 percent of tax revenues. Sanford (1995), suggests that compliance costs are perhaps four to five times larger than the direct administrative costs incurred by governments. A recent study of compliance costs concerning the personal income tax in India by Chattopay and Das Gupta (2002), suggests that compliance costs may be as much or more than ten times higher than in developed countries.

2.2.3 Review of Studies on Sub-Sahara African countries

Motivated by the works of Engen and Skinner (1996), on "taxation and economic growth", Musaga (2007), uses labor, capital, government consumption, and tax revenue as explanatory variables against GDP for 18 years to review the 1990 tax reforms and the effects on the Uganda economy. He said the reforms improve administrative efficiency and ensure better taxpayer compliance but negative growth effects are resulting from taxation and difficulties to measure the potential benefits from taxation. Musaga's result shows that a 1 percent charge of indirect taxes would increase economic growth by 0.9 percent and a percent change in direct taxes would negatively impact economic growth by 0.5 percent. But when indirect and direct taxes are combined, the result showed a percentage change in total tax revenue would reduce economic growth by 0.12 percent.

Using Data Envelope Analysis (DEA) and transcendental logarithm (Translog), Chiuma and Simwaka in 2012 studied the Malawi Tax policy development, donor inflows, and economic growth. Their analysis stated that a one percent decrease in tax burden can raise economic

growth by 0.8 percent in Malawi, while a similar reduction in the collection of taxes through expenditure can raise growth by 0.6 percent. They concluded that a reduction in tax burden has more potential in influencing economic growth than fine-tuning the proportion in which income and consumption taxes are collected in Malawi. The findings of Chiuma and Simwaka (2012) were also supported by Ferede and Dahlby (2012) who found out that a higher provincial statutory corporate income tax rate is associated with lower private investment and lower economic growth. They further stated that a one percent cut in the corporate tax rate is related to a 0.1 percent to 0.2 percent increase in the annual growth rate.

Consistent with the study of Musaga, Bekoe (2012) scholastic study on “tax evasion and economic growth in selected Sub-Sahara African countries”, examines the impact of high tax rates on economic growth and find out that tax evasion stifles economic growth such that for every 10 percent increase in tax evasion mitigates economic growth by about 7.1 percent. These findings also justify the argument that optimal tax rates would increase tax revenues and hence economic growth as opposed to increased tax rates.

Ogbonna and Ebimobowei (2012), undertook a study on the “impact of tax reforms and economic growth of Nigeria” using a time series analysis period of 15 years. Their finding stated that tax reform is positively and significantly related to economic growth and that tax reforms can enhance revenue generation and mobilization to support government fiscal space that will translate to economic growth. They concluded, however, that economic growth cannot be realized if the tax reform processes do not review the tax laws and rate to the modern trend, corrupt-free and efficient and effective tax administration backed by transparent and accountable staff.

Though difficult to tax it is prudent to bring in the informal sector to the tax net when reforming the tax system of any country particularly so when developing countries like Sierra Leone are overwhelmed by the informal economy. To ascertain this claim, Osoro (1995) used Tanzi’s and Guttmann’s approaches to determine the relationship between buoyancies and the informal economy, he stated that the growth of the underground economy erodes the tax base and consequently mitigates tax receipts which affect the revenue productivity. Using 23 years to estimate the size of the underground economy and the magnitude of tax evaded, Osoro’s result shows that the underground economy grew from 10 percent in 1967 to 31 percent in 1990 of

GDP, while tax evasion in 1990 equal to more than one-third of the total tax. In 1990 there is a lower tax rate and higher buoyancies and in 1970, a higher tax rate and lower buoyancies, in effect, this appeals to the Laffer curve effect.

With the emergence of the WTO and then the introduction of trade liberalization, most of the developing countries including those in Sub-Saharan Africa were attracted to it, to see their dream come true to be an industrialized nation. However, other than benefits, some costs are also associated with trade liberalization. According to B. Yasmin, et al (2003), the reduction of trade barriers in the wake of trade liberalization has resulted in a loss in tariff that accounts for approximately 20 percent for developing countries. If tariffs are reduced or eliminated, these countries will have to impose large increases in other taxes to keep their budgets in line, causing some economic distortions.

The relationship between trade tax revenue and trade liberalization is ambiguous because economists have different views about the impact of trade liberalization on the productivity of trade tax revenue. Prithett and Sethi (1994), for example, believed that higher tariff stimulates importers for seeking exemptions so it may affect the productivity of the tax system, and the lower tariff in some areas becomes a cause to increase in the tax base by lowering the marginal benefit to avoid taxation, hence liberalization leads to a rise in revenue. So this is not always the case that the reduction of tariff due to liberalization leads to the reduction in revenue. Tanzi (1989), also observes often an inverse relationship between a country's tax revenue and the real level of its exchange rate, he is of the view that overvaluation has a direct effect by suppressing import and export bases measured in domestic currency terms. This in turn reduces the collection of international trade taxes, and sales and excise taxes. In conclusion, Tanzi (1989) stressed that the tax collection method is different in different countries, and it is therefore not possible to generalize about the effect of changes in trade liberalization and the surrounding macroeconomic environment on tax revenues without examining the structure of the different components of revenues.

In studying the implications of trade liberalization on international trade taxes of the South African economy, A. Matlanyane and Harmse (2002), estimation results show that customs revenue is highly productive. Also, trade liberalization has a significant influence on customs revenue, and that an increase in imports may lead to a reduction in trade tax revenue. On the

other hand, the results suggest that supportive macroeconomic policies are critical and that the South African government should marry the liberalization policies with exchange rate liberalization policies. In support of this assertion, a 2006 IMF working paper on *“Fiscal Implications of Multilateral Tariff Cuts”* for fifty-eight low-and middle-income countries, opined that while only a small number of countries face a significant impact, results point toward the need for complementary fiscal measures in the countries most affected by revenue loss.

In her paper, *Janine Terhoeven* opined that many Sub-Saharan African countries give tax holidays to attract FDIs which allow for the exemption of companies from tax for a specified period on the achievement of certain conditions. Tax holidays were identified as the form of tax incentive that matters the most in attracting FDI to Sub-Saharan African countries. (Cleeve, 2008), However, this fiscal policy is associated with various challenges, and it has been criticized by some tax specialists as a recipe for a significant loss in tax revenue. Bolnick (2004) claims that in cases where the significant potential is derived by the investor from the use of such fiscal policies, the nature of the project being undertaken is such that it would have occurred even in the absence of such tax incentives. He furthered that the use of tax holidays also serves as a recipe for tax avoidance because there is the probability for companies to abuse this incentive and remove themselves from a country once the period allowed by the tax holiday elapsed. Though it is a good measure to attract FDIs through tax holidays there is the need for prudent monitoring on the effective and efficient use of this policy by Sub-Saharan African countries.

2.2.4 Review of Studies on OECD Countries

Some empirical studies prove that tax has a negative relation with growth, which indicates raising the marginal tax rate, for example, is associated with compromises with growth performance, but some empirical evidence proves otherwise. To investigate the long-run relationship between tax structure and economic growth in high-income OECD countries, Bujang et al. (2013) used a panel unit root test and panel cointegration analysis. Their findings reveal that there is no long-run cointegrating relationship between tax structure and both GDP and gross saving in developing countries.

In determining the impact of taxation on the growth rate of some OECD countries, Plosser (1992) compared the growth rate of per capita GDP of twenty-four OECD countries between

1960 and 1989. His findings reveal the calculated correlation between taxation and economic growth is minus 0.52. Easterly and Rebelo (1993) extended the analysis by using the marginal rate of tax on different measures in regressions model which involves other determinants of expansion such as initial income, school enrolments, assassinations, revolutions, and war casualties, and concluded that tax matters for economic growth is disturbingly fragile, as the two variables are inversely correlated. Besides, Padovano and Galli (2001), opined that the study conducted by Dackehag and Hansson (2012) revealed a negative relation of income and corporation tax with growth performance. Vartia et al. (2008) also find the negative impact of corporation tax for OECD countries.

Based on the extended neoclassical growth model of Mankiw et al. (1992), Macek (2014) evaluated the impact of individual types of taxes on the economic growth of 21 OECD countries for the period, 2000-2011. It was found that corporate taxation followed by personal income taxes and social security contributions are the most harmful to growth. Tosun and Abizadeh (2005) documented a decline in shares of payroll, goods, and services and positive growth from personal and property taxes. A study on economic growth and tax charges in OECD countries reveals that economic growth has a significant effect on the tax mix of GDP per capita.

Using a cross-countries regression analysis with an economic model that amalgamates channels of transmission that affect economic growth, Lelb Fritz, et al (2000) analyze the “taxation and economic performance” in OECD countries. Their result showed that the increase in the average tax rate of about 10 percent over 35 years may have reduced annual growth rates by about 0.5 percent but a cut in tax to GDP ratio by 10 percent of GDP may increase annual growth by 0.5 percent to one percent, while Tanzi and Schuknecht in 1996 view that total public expenditure could be reduced to less than 30 percent of GDP without sacrificing much in terms of social or economic objections. They concluded that some economists are with the view that a lower rate of economic growth and a higher level of unemployment in OCED countries is due partly to the general increase in the tax burden and system that interfere with incentives to save, invest and work. These analyses further support the idea that high tax rates may negatively influence tax revenues which in turn will also impede economic growth.

Given the potential benefits of FDIs, policy-makers continuously re-examine fiscal rules to make them attractive for investors but a majority of the studies on the effects of fiscal reforms on FDI

ignore the strategies post-tax used by investors to reduce the tax burden. However, recent works of the OECD countries encourage analysts to take into consideration the effects of such activities when studying the impact of taxes on FDI. According to Gordon and Hines (2002), “fiscal policies are capable, in an evident way, to affect the volume and location of FDIs; since higher tax rates decrease income after tax, therefore discouraging reinvesting initiative”. This view according to which FDI should react to taxes on profit is widely accepted in the academic field, as well as operational, even though empiric and theoretic studies show that the real impact is insignificant, maybe even inexistent.

According to Bénassy-Quéré et al., (2004), the practice of transfer pricing and credits between companies allows enterprises to transfer profits where taxes are the lowest, thus breaking the link between the location of the profit and where production is located. Despite these arguments, Hines (1999) and Gordon and Hines (2002), opined that empirical evidence shows that MNCs respond to tax incentives, whether they are contained in tax laws (to avoid international double taxation) or in tax rates. As a double taxation regime would strongly discourage international business activity, most countries avoid it by using the bilateral tax treaties based on the OECD Model Tax Convention. In the EU for example, the Parent-Subsidiary Directive ensures that countries either adopt a credit system or an exemption system to avoid international double taxation within the Union. Greece, Italy, and the UK for example, adopt the credit system while the other EU countries adopt the tax exemption system.

2.2.5 Review of Studies on Sierra Leone

2.2.5.1 Evolution of the Sierra Leone Tax System

The efficient and effective tax administration system in Sierra Leone has ever been a daunting challenge as evident in the “Hut Tax War” of 1898 by the colonial masters which saw stiff resistance to tax compliance. The first legislated tax was in 1932 called the Customs Tariff Ordinance with subsequent amendments in 1972, other tax laws including Income Tax Ordinance 1943, Payroll Tax Act 1972; Foreign Travel (Ticket) Tax Act 1975, Entertainment Tax Act 1975; Excise Act 1982; Restaurant Food Tax Act 1989; Sales Tax Act 1995; ECOWAS Common External Tariff (CET) and amendment Income Tax Act 2000; Goods and Services Tax Act 2009, the Extractive Industry Revenue Act 2018, the Revenue Administration Act 2018 and series of Finance Acts.

Sierra Leone's tax administration system has undergone fundamental tax administrative reforms since the mid-1980s in response to the need for socio-economic development. During this period, the Sales Tax was introduced, the Income Tax Act redrafted, and the scope of the excise duties scaled back and simplified. The 1991 Constitution of Sierra Leone legally mandated tax authorities to levy and collect taxes partly or solely on Capital gains Tax, Corporate Tax, Personal Income tax, Stamp Duties, GST (Domestic and Import GST), PAYE, Payroll Tax, Withholding Tax (10% and 5%), Customs Duties (Import Duties, Withholding 3% Income Tax, and other charges), Royalties, Licenses, Legal Registration & Survey Fees and Gift Tax, etc.

Though tax reforms in Sierra Leone can be traced during the colonial era, major tax reforms started in 2002 when the Sierra Leone National Revenue Authority bill was enacted which saw the merger of the Income Tax Department and the Customs Department. According to the 2004 NRA Annual Report, the daunting reconstruction, developmental and social needs of the country after over a decade of brutal civil conflict, saw the passing of the National Revenue Authority Act, 2002 by Parliament to consolidate and strengthen national revenue administration.

Despite these reforms, the then Revenue Agencies of the government failed to generate sufficient tax revenue to finance the increasing budgetary deficits of the central government. According to the 1998 IMF report, the poor performance of the then Revenue Administration was characterized by a lack of clearly defined processes and procedures, the manual handling of tax operations, low remuneration for revenue officials, lack of trained and motivated personnel, ineffective ICT systems, the existence of a large informal sector, lack of transparency and accountability in revenue collection (corruption), poor record-keeping by some businesses which make auditing of such businesses difficult and in some cases impossible, low tax base coupled with poor training, and high operating costs in a fragmented administration system; especially from the income tax front. Kargbo and Egwaikhide (2012) also opined that “the reforms have not been part of a concerted effort to reform the entire tax system but part of the efforts to raise more revenue through budget pronouncements affecting the tax rates or tax brackets”.

The PAYE tax bracket for example was 25% to 40% in 2000 to 2010 but was later reduced to 15% to 30% between 2011 and 2015, and increased to 35% between 2016 and 2018. The Corporate Income tax rate which was around 35% from 2001 to 2001 was reduced to 30% to induce investments. However, Withholding Income tax on resident contractors and non-residents

contractors increased from 5% to 5.5% and 10% to 10.5% respectively between the periods 2000 to 2018. The tax reforms also introduced the GST/VAT with a flat rate of 15% for both Domestic and Import GST in 2010. And in 2013, we saw the introduction of Turnover Tax with bracket rates between 2% to 6%, and Capital Gains Tax with a rate of 30%. Despite this, the enactment of the EIRA saw an increment of royalty payments on the mines and minerals sector. Minerals obtained from artisanal mining license, for example, is now 3%, Precious stones other than special stones is 7%, Special stones are 8%, Precious metals is 5%, royalties on Crude Oil and natural gas is 10% and 5% respectively, while royalties of bulk minerals such as Iron Ore, Rutile, and Bauxite is 3%.

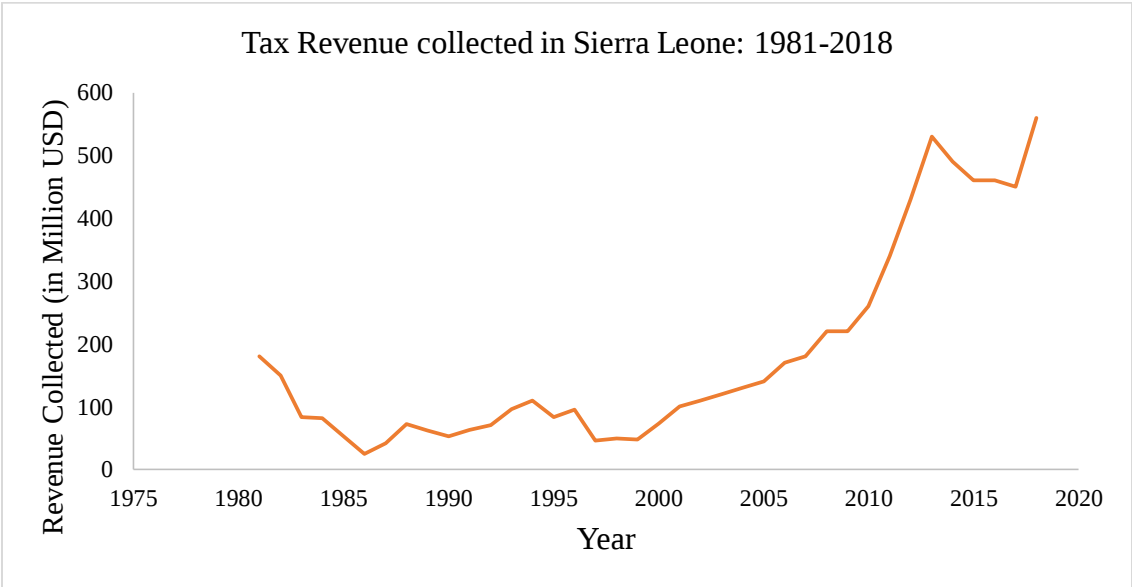
Under the current Sierra Leone tax law, Government's fiscal policy is designed and enforced by the two-tiered tax structure i.e. the State, and Local Governments with each has its tax jurisdictions and mandate. The tax system is structured among others to achieve the following fiscal objectives: "to pursue fairness, equity, and promote fiscal discipline and accountability; to facilitate trade and investment that will stimulate economic growth and development; to provide the government with stable resources for the provision of public goods and services, and to address inequalities in income distribution and provide economic stabilization".

According to Venanzi, over the years, Sierra Leone has depended largely on the revenue coming from the mining and agriculture sectors to the utter neglect of other domestic sources of revenue. Ruharah, et al, claims that the insufficiencies of tax revenue in Sierra Leone can be traced to various factors but not limited to the following: lack of real-time statistical data; poor tax administration; the inability to prioritize tax effort; the complexity of taxes; high incidence of corruption in the country coupled with the inability of the tax administrators to harness the tax resources in the huge informal sector of the economy. The uncertainties of the revenue inflow from the mining and agricultural sectors coupled with the other factors as espoused by Ruharah et al make it imperative for the development of the tax administration system to produce greater tax yield thus, making it difficult for the government to meet her ever-increasing demand for public goods and services.

Irrespective of the fact that the reforms were not comprehensively done the formation of the Authority has ushered in some major tax administrative reforms and recorded an impressive actual revenue performance as against its annual targets in the first two years of its actual

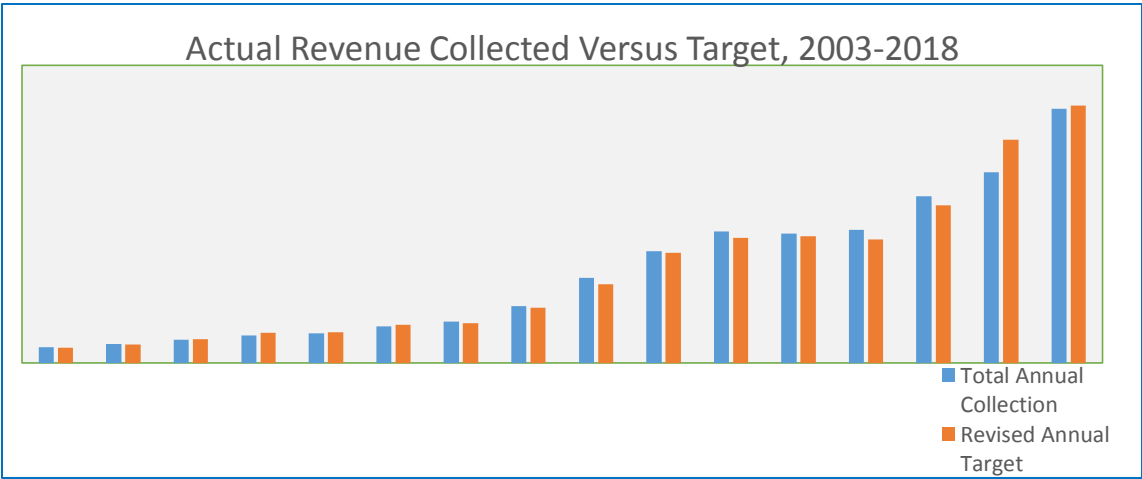
existence (2003 -2004). Though it consistently fell below target from 2005 –2008 but maintained a surplus collection in the recent years of 2009 to 2016 and 2018 even in the course of Ebola as shown in Figures 2 and 3.

Figure 2: Revenue Mobilisation in Sierra Leone: 1981-2018



Source: Source: Author's computation from the World economic indicators of the World Bank, IMF, ICTD, and Sierra Leone’s National Revenue Authority databases, 2020

Figure 3: Total Revenue collected versus Annual Revised Targets:2003-2018



Source: Author's computation from Sierra Leone’s National Revenue Authority databases, 2020

2.2.5.2 Taxation and Governance in Sierra Leone

The NRA as a semi-autonomous government institution is charged with the responsibility of collecting and accounting for all domestic revenues including the Non-Tax revenues as enshrined in the NRA Act of 2002. It is headed by a Commissioner-General (CG) and deputized by a Deputy Commissioner-General. The activities of the Authority are overseen and supervised by the Board of Directors and the Ministry of Finance respectively. The Board Chairman and Board of Directors including the CG and DCG are appointed by the Presidency subject to the approval of the parliament.

The Board of Directors is constituted by seven members: the Chairman, the Financial Secretary, the Sierra Leone Bank Governor, a Tax Specialist, an Economist, a Legal Practitioner, and the Commissioner-General who served as the secretary to the board. The NRA Senior Management comprises the CG, DCG, and followed by Commissioners and Directors of the Operational and Support departments respectively.

Despite the reform agenda the central governance system poses several challenges affecting the desired outcomes of the reforms because the role of patronage politics has become prominent particularly so in the first two decades after independence as political power relies on the ability of those in state governance to dispense privileges to their most powerful supporters, this saw a gradual process of political and economic decline to grew into a full-blown crisis beginning at the end of the 1980s, as the basic functions of the state began to be eroded following the economic shocks of the late 1970s. To support this assertion, Samuel Jibao (2011) opined that the extent of economic growth decline during the 1980s is starkly reflected in the level of government revenue.

According to Jibao (2011), “until 1981, tax revenue hovered consistently around 15 percent of GDP, which was entirely comparable to levels elsewhere in the region. However, the years that followed witnessed a dramatic decline in revenue to 10 percent of GDP in 1982, 7.5 percent in 1983, and less than 5 percent by 1986”. He furthered that “such low levels of revenue were not nearly sufficient to operate a modern state, and by the late 1980s, the government found itself unable even to meet the salaries of civil servants and the military. Whilst economic crisis played an important role in precipitating this fall in revenue, such a dramatic decline can only be fully explained by the increasing politicization of tax collection, as exemptions were granted to

political allies, corruption expanded and the state lost its ability to monitor and regulate activities within its borders”.

However, the key objective of tax exemptions/duty-free is to enhance the economy by the implementation of a variety of tax incentives for investment and employment that will increase exports, and promote economic growth. Often, such incentives are redundant and ineffective, giving up revenue and complicating the fiscal system without achieving its desired objectives. Even to the extent that the incentives may be effective in inducing investors to behave differently than they would have done in response to market signals, the result is often distorting and inefficient, diverting scarce resources into fewer optimal use. When tax revenue declines significantly, and without a clear economic explanation, this is likely to reflect broader political developments, and particularly the spread of politically motivated exemptions and corruption.

Since 2010 to date, the administration and granting of duty-free/tax exemption is under the authority of the Ministry of Finance, and the role of the NRA has been relegated to review and processing duty exemption applications, and in most cases proffer advice on duty exemption to the state. According to the NRA statistics bulletin, between 2004 and 2018, a total of Le2.6 trillion was waived by the government which represents 19 percent of total revenues collected and 2 percent of GDP cumulatively. Specifically, in 2011, total exemptions amounted to Le586 billion representing about 41 percent of total revenue collected and 5 percent of GDP in the same year (see Table 1). This situation revealed that amidst the tax reforms revenue collection is still compromised by the deliberate actions of state authorities, thus, posing a risk to the very essence of the tax reforms-revenue mobilization efforts.

Table 1: Duty-free/tax exemptions: 2004-2018**(Amount in Million Leones)**

Year	Duty-free	Others	Total Exemptions	Tax Revenue	GDP	Total Exemptions as % of Tax Revenue	Total Exemption as % of GDP
2004	53.7	5.82	60	319.2	3,913	19%	2%
2005	46.7	8.5	55.23	393	4,769	14%	1%
2006	37.8	8.3	46.2	463.9	5,584	10%	1%
2007	25.1	15.1	40.1	501.9	6,443	8%	1%
2008	38.9	20.1	58.4	615.6	7,470	9%	1%
2009	35.8	24.3	60.1	700.4	8,308	9%	1%
2010	163.5	105.1	268.6	956.1	10,256	28%	3%
2011	431.1	155.1	586.1	1,428.8	12,798	41%	5%
2012	365.3	223.8	589.1	1,874.8	16,515	31%	4%
2013	259.1	195.1	453.44	2,212.5	21,317	20%	2%
2014	199.1	173	372.3	2,174.4	22,689	17%	2%
2015	136.4	239.5	375.9	2,235.4	21,434	17%	2%
2016	199.1	138.1	336.3	2,799.7	22,369	12%	2%
2017	227	176.1	403.1	3,204.6	27,877	13%	1%
2018	395.4	101	496.1	4,272.1	32,401	12%	2%
Total	2,613	1,587	4,200	24,152	224,143	19%	2%

Source: Own computation from Monitoring, Research, and Planning Department, NRA

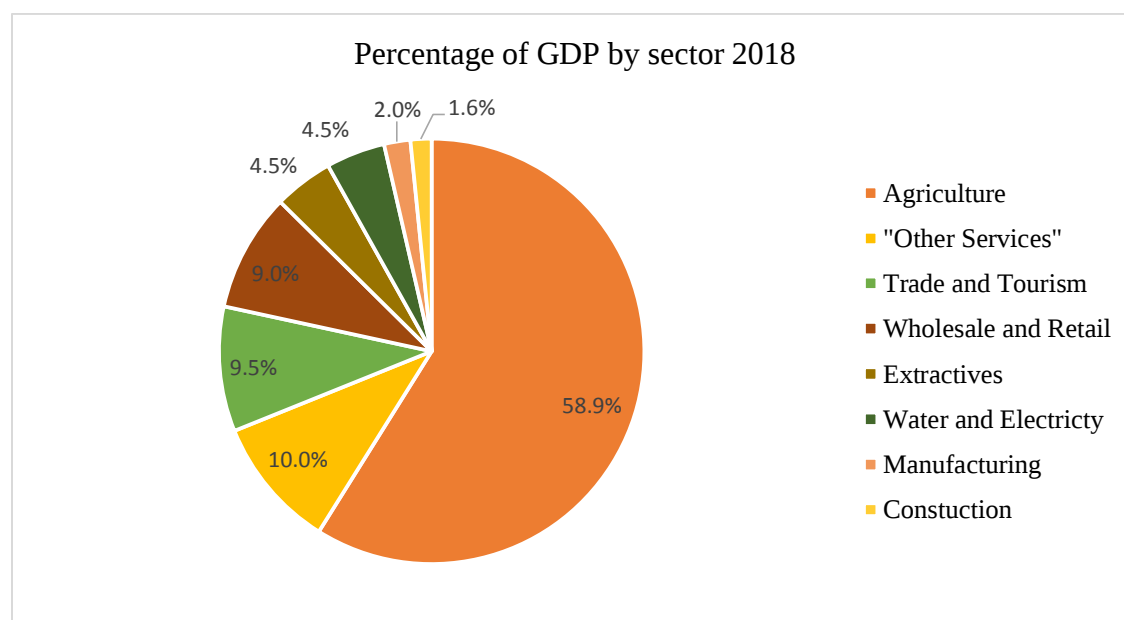
2.2.5.3 Overview of the Sierra Leone Economy

Sierra Leone is a small open, and non-oil producing country with an estimated population of 7.8 million people (2015), with a nominal GDP of US\$4.1billion and per Capita income of about US\$534, a tax-to-GDP ratio of 13.7 percent and, human development index of 0.28 percent in 2018. The country is endowed with mineral deposits including but not limited to diamond, bauxite, iron ore, rutile, and gold, etc. Earnings from mineral exports account for the remaining 60 percent of the country's foreign exchange earnings and the economic development has always been hampered by an overdependence on mineral exploitation. Therefore, the economy could thus be described as one which is "exploitative" in nature with primary products.

However, the agricultural sector constituted the largest sector of the economy contributing approximately 58.9 percent of GDP in 2018 and providing about 67 percent of employment from 1991 to 2018. The agricultural sector is a significant source of foreign exchange, in 2018 for

example, it accounts for approximately US\$1.7 billion from exports (representing 17 percent of trade openness). In comparison, the manufacturing sector is rather small, constituting mainly import-substituting industries whose production accounted for about 2 percent of GDP in 2018 (See Figure 4).

Figure 4: Sectoral Contribution to GDP: 2018



Source: Author's computation from the World Bank Development Indicators, 2020

Sierra Leone's economy has undergone series of fluctuations with instability, during the first decade after independence in 1961 for example, the economy grew by an average of 3.8 percent which was mainly driven by strong mining and agriculture production. The GDP per capita grew 32 percent in the 1960s, reaching a peak growth of 152 percent in the 1970s but shrank by 66 percent in the 1980s and a further 11 percent in the 1990s. From 1960 to 1969, inflation was on average low at 2.1 percent and strong export growth of about 5 percent with appreciable local currency and the stable exchange rate at on average of Le0.74 to US\$1, thus, causing the foreign reserves position to be comfortable.

Despite the first oil price shock, strong economic fundamentals continued in the first half of the 1970s causing the economy to grow by an average of 2.7 percent during this period, and inflationary pressures started with an average rate of about 11 percent with a depreciating but manageable exchange rate of 3 percent and a comfortable foreign reserves position. Economic

growth slowed down to an average of 1.6 percent in the second half of the decade mainly due to the fall in output in the mining sector following the closure of the Marampa Iron Ore mines.

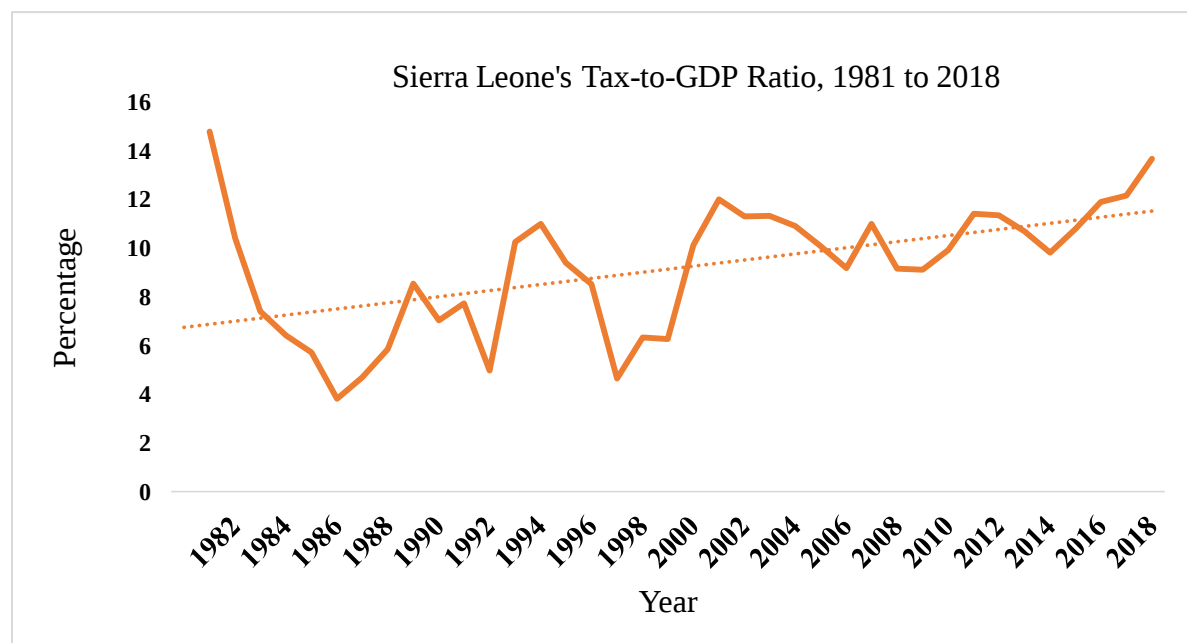
However, after the hosting of the OAU in 1980, the Sierra Leone economy experienced a sharp decline in the mid-1980s characterized by severe macroeconomic instability, thus, seeing a decline in per capita incomes with low domestic revenue of 5 percent of GDP in 1986 with a high inflation rate of about 179 percent in 1987, weak fiscal and current account positions causing about 80 percent of the population to live below the poverty line, thus, leading to an eleven-year-old civil war that destroyed the social and physical infrastructure, resulting in a significant deterioration of economic activities, aggravating the unemployment and poverty situation between 1991 and 1999. In 1997 in particular, the economy contracted by 18 percent, stagnated in 1998, and contracted further by 8.1 percent in 1999.

As a consequence, between 2000 and 2010, several economic reform programs including tax reforms were implemented causing the economy to recover strongly in the immediate post-conflict era with a GDP growth rate between 4 and 7 percent, and real GDP growth averaged 6.7 percent. Inflation fell sharply with an average of 3 percent from 2001 to 2003 but reemerged in 2004 reaching 13 percent before declining to 7.2 percent in 2010. During the global financial crisis of 2008-09, the real GDP growth rate slows down to 5.4 percent in 2008 and further reduce to 3.2 percent in 2009. Though the exchange rate depreciated remarkably in 2009 by Le 1,294 to one USD in 2009, the recovery in the mining and continued expansion of the agriculture and services sectors led the economy to recover strongly in 2010 with real GDP expanding by 5.4 percent.

The period between 2011 and 2018 saw the economy in a stable growth trajectory due to an increased level in the mining sector activities specifically as a result of the reopening of the Iron Ore mines in the country by the African Minerals and London Mining. This saw the nominal GDP expanding by an average of 15.4 percent from 5.4 percent in 2010 to 21 percent (largest in the world) in 2013. Between the periods 2014 and 2015, this growth trajectory was adversely affected by the twin shocks of the Ebola and the global fall in commodity prices causing the exchange rate to depreciate to Le6, 290.3 in 2016 and stood at Le7, 931.6 to the USD in 2018, with real GDP growth rate slowed down to 4.2 percent in 2017, further down to 3.4 percent and, the external debt stock increase by 17.1 percent of GNI in 2018. Foreign direct investments

reduced by US\$ 222 million which resulted in a decline in trade openness by -31 percent of GDP and, inflation rose to 18.2 percent in 2017 but declined to 16 percent in 2018. Despite this downward trend in the economy, tax revenue continues to increase but the share of tax revenue in GDP still fell below the average Sub-regional ECOWAS target (20 percent) by 6.3 percent as shown in Figure 5.

Figure 5: Sierra Leone's Tax Revenue as a share in GDP: 1981-2018



Source: Author's computation from the World economic indicators of the World Bank, IMF, ICTD, and Sierra Leone's National Revenue Authority databases, 2020.

2.2.6 Summary and Evaluation of the pieces of Literature

Taxation is an interesting fiscal instrument in its own right only when the expenditure decision rules indicate the need for specific government expenditures without simultaneously specifying how those expenditures are to be financed. When this occurs, the same criteria that guide public expenditure analysis also apply to the collection of tax revenues.

One critical but important issue for empirical research on taxation and growth in developing countries is to include efforts to mobilize new empirical evidence on the impacts of different tax policies, but looking at the literature, the empirical relationship of tax reform with growth performance is still unclear. Analyzing these taxation theories, the researcher believes that all of

them are correct because they describe the economy in different scenarios at some point in time. The Classical school for example does a great job of describing the economy in the long run where resources are fully employed and people are working. The Keynesian on the other hand also does a great job of describing what happens when there is a recession and people are out of work or when the economy is temporarily overheating and a shortage of workers takes place. These theories were generated in a specific socio-economic environment and both have served the intended purpose. However, these theories fail to address the new problems faced by the people in a new set of environments, and consequently, new theories had to be generated from the 1970s onwards.

Arthur Laffer believed that the more money taken from a business out of each additional dollar of income in the form of taxes, the less money it will be willing to invest and that the economic effects of reducing incentives to work and invest by raising tax rates would be damaging in the best of times and even worse amid a stagnant economy. Due to market failure, there is the need for the critical role of government to intervene and regulate the economic activities of the state without worsening the welfare of her citizens where the poor citizens whose ability to pay is low, but at the same time should benefit from those tax receipts received by the government as argued by the Trickle-down theory.

In particular, taxes should promote society's microeconomic goals of allocational efficiency and distributional equity. A natural tension will then arise between tax policy and the goal of allocational efficiency because most taxes generate distortions in the market system by forcing suppliers and demanders to face different prices. These distortions misallocate resources which is not desirable, of course, but it is also an unavoidable cost of having to raise tax revenues. One goal of normative tax theory, then, is to design taxes that minimize these distortions for any given amount of revenue to be collected. Alternatively, if the government must use one of two or three specific kinds of taxes to raise revenue, the optimal tax theory as espoused by James Mirrlees in 1971 should indicate which of these taxes generates the minimum amount of inefficiency.

Despite the much theoretical and empirical inquiry as well as political and policy controversy on taxation and growth, no simple answer exists. Some contend that because growth never occurs across economic sectors evenly, it is inevitable that increased inequality will result. Others

contend that societies in which resources are distributed more equally will do better in the long term. Still, others suggest that, whatever the answer may be, countries can devise policy measures that are fully compatible with achieving both more growth and more equity. While the answer likely depends on a country's specific circumstances, the current situation in many developing countries offers, at least in principle, so many opportunities for improvement that some countries may be able to have their financial growth and redistribution.

In as much as the researcher is oblivious of the fact that the objective of every tax reform is to simplify tax processes and procedures with the ultimate goal of maximizing domestic revenue, so also higher tax rates have the potential to influence the flow of resources to other sectors that may have lower productivity as experienced in most developing countries. In effect, this crowds out private investment, reduces labor demand, and distorts the efficient use of human capital by discouraging workers from employment in sectors with high social productivity. The tax system of any nation, therefore, should reflect on its economic structure because, though taxation might have a distortionary effect on the economy, more generally, not all distortionary taxes may have some adverse effects on economic growth in the long term; the net effect depends on the fact that the considered tax is or no used as an instrument to correct negative externalities or other distortions.

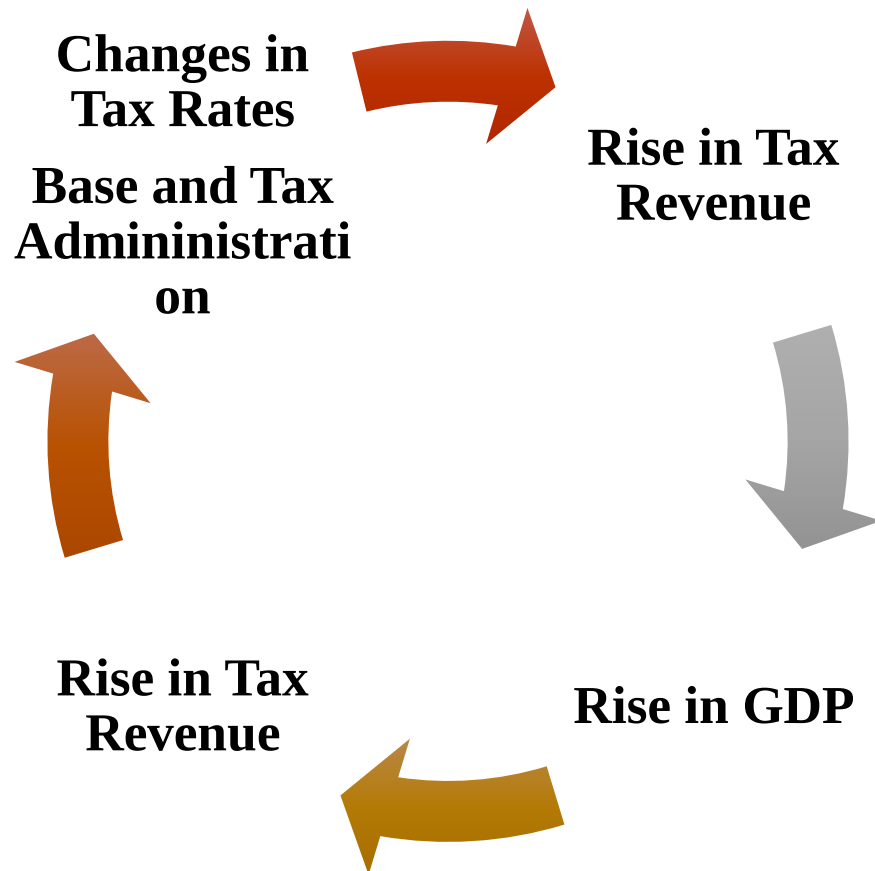
The key message the researcher gained from these theories and empirics, therefore, is how policymakers globally including Sierra Leone, could effectively design tax policy that will protect and promote the welfare of its citizens consistent with the arguments contained in the optimal tax theory. However, the researcher believes that though it has some shortcomings, the Laffer curve theory is preferable for the reason that it juxtaposed the need to have balance in designing tax rates during the tax reforms agenda of any country.

2.3 Conceptual Framework

This section of the proposal seeks to explain the relationships that do exists between the reforms and tax revenues and by implication to the economic growth of Sierra Leone.

Ceteris paribus, change in the tax rates, tax base and tax administration will positively to lead to an increase in government revenue growth which will increase GDP. The rise in GDP can also cause a rise in tax revenue which will suggest more tax reforms for economic growth sustainability.

Figure 6: Conceptual framework



CHAPTER THREE

3 Method of the Research

3.1 Introduction

This chapter highlights the basic econometric issues related to time series data and provides a basic methodological framework for analysis. It includes the process of how the data was collected, the model specifications, the post estimation signs, and, the various estimation procedures used to investigate the effects of tax reforms on revenue performance and the impact of the reform induced- tax revenue on the economic growth of Sierra Leone from 1981 to 2018.

The Augmented Dickey-Fuller and the Zivot Andrews Unit root tests were used to determine the stationarity of the variables. Following that the Johansen cointegration test cannot be applied directly if variables of interest are of mixed order of integration, this study adopts the Bounds test approach to cointegration. The bounds test for cointegration was used because it helps to determine the short-run and long-run relationships amongst the variables of interest, and also guides the researcher to specify the short-run ARDL and the long-run ECM.

The study employed the ARDL-ECM approach proposed by Pesaran et al. (2001) to establish the long-run and short-run relationships among the variables of interest. The ARDL/ECM contains the lagged value(s) of the dependent variable, the current and lagged value(s) of regressors as explanatory variables, and, is relatively more efficient in the case of small and finite sample data sizes with an unbiased long-run estimate as in the case of this study.

However, having established cointegrating relationships among the variables of interest, the researcher then proceeds to estimate the long-run estimates of the short-run dynamic coefficients using the ECM. The F-Statistic information summarized in the P-Probability was used to test for the significance of each variable in the two models, but more importantly the significance of the induced-reformed tax revenue on the real GDP of Sierra Leone.

Three model specifications were used in this paper. The first model explains tax revenue as a function of the Active Labor Force, Gross Fixed Capital Formation, Trade, and a reformed dummy. The second is a model of real GDP specified based on the structure of the model to establish the effect of the induced reformed-tax revenue on growth. Real GDP is adopted as a

proxy for the rate of economic growth, and Tax Revenue is defined as the total tax receipts collected for the period under review. Due to the different types of tax reforms implemented at different periods, this paper used a third model that explains the effect of the reforms undertaken on the different tax handles of the overall revenue productivity.

Model one was estimated and the fitted/predicted value of tax revenue that captures a linear combination of tax revenue and its dependent variables was obtained. To link the two models, the paper uses the fitted/predicted value of tax revenue from Model One as one of the independent variables to estimate Model Two. The study further carried diagnostic tests to check for the robustness and stability of the models. The tests include the Durbin Watson (DW) statistic for serial correlation/non-autocorrelation of residuals; Breusch-Pagan White's test for heteroscedasticity; Shapiro-Wilk W test for Normality; Ramsey RESET test for functional misspecification and, the CUMSUM test.

This study employed the Sierra Leone annual time series data from 1981 to 2018, and the data were obtained from the World Bank and IMF Development Indicators 2020, data for Tax Revenue was extracted from the Sierra Leone National Revenue Authority and the International Center for Tax and Development databases respectively. Other sources of data include but not limited to the following: Bank of Sierra Leone publications, Statistics Sierra Leone, National Mineral Agency, Ministry of Finance, textbooks, etc.

3.2 Empirical Tests

3.2.1. Determination of the stationarity of variables

Empirical work based on time series data is most often than not assumed to be stationary, if a time series is nonstationary, the spurious results are likely to arise. So we can use stationary or first differenced variables to overcome this problem. But, the use of differenced variable sometimes remove the long-run information from the data set and merely provides short-run information. To solve such a problem, it is advisable to test for stationarity and determine whether or not the long-run relationship exists among variables in the model. In support of this assertion, Granger (1974), claims that one cannot run any regression unless all variables are stationary. According to Granger, if $R^2 > DW\text{-statistic}$, it implies to suspect that the estimated regression is spurious and cannot be used for forecasting as well.

Though the Bounds Test approach to cointegration does not need pretesting of variables for unit roots we must conduct this test to ascertain that the variables are not integrated of an order higher than one. The order of integration on the yearly series of RGDP, TREV, ALF, FDI, TRD, EXR, DINV, INF, ITAX, GST, NTR, and INTrTax at level data and as log-transformed series, first difference, and, including both intercept and trend were carried out separately using the ADF and Zivot Andrews unit root tests respectively, and the Akaike Information Criterion (AIC) was used to determine the optimal number of lags included in the test.

3.2.1.1 Augmented Dickey-Fuller (ADF) unit root test

The ADF test is the most common method for testing unit roots. The ADF test constructs a parametric correction for higher-order correlation by thinking that the series follows an AR (k) process and adding lagged difference terms of the dependent variable(s).

With the ADF tests, the null hypothesis of unit root is rejected if the test statistic is more negative than the critical value. If we do not reject the null, the series is non-stationary whereas rejection means the series is stationary. The results of the ADF are analyzed and presented in the next chapter that deals with the findings of this study.

3.2.1.2 Zivot Andrews Unit root test

A problem common with the ADF test is that it does not allow for the possibility of a structural break. Unlike the ADF test for stationarity, the Zivot Andrews Unit root test allows for a single structural break in the intercept and the trend of the series, as determined by a grid search over possible breakpoints.

The Zivot Andrews test consists of three models to test for a unit root in which the first model allows a one-time change in the level of the series; the second model permits for a one-time change in the slope of the trend function, and the third model combines one-time changes in the level and the slope of the trend function of the series. Like the ADF test, the null hypothesis of a unit root in the Zivot Andrews test is rejected if the test statistic is more negative than the critical value, and, the results of the Zivot Andrews unit root test are analyzed and presented in the next chapter that deals with the findings of the study.

3.3 The ARDL-ECM Bounds Testing Cointegration Approach

Since the Johansen Cointegration Test cannot be applied directly if variables of interest are of mixed order of integration, an ARDL-ECM Bounds test to cointegration approach was used in this paper in determining the relationships between the variables with mixed order of integration. Pesaran and Pesaran (1997) claims that the ARDL-ECM Bounds test to cointegration is preferable because the test on the existence of a relationship between variables in level can be applied irrespective of the fact the underlying regressors are purely I(0), purely I(1), or fractionally cointegrated.

Despite this, Banerjee et al (1993), also argues that the ECM can be derived from the ARDL model by a simple linear transformation. In support of this proposition, Pesaran and Shin (1999), also claims that the ECM can integrate short-run adjustments with long-run equilibrium without losing the long-run information. They concluded that the small sample properties of the ARDL-ECM method are more robust and can perform better than that of Johansen and Juselius's cointegration method.

To illustrate the ARDL-ECM modeling approach, let us consider the following simple model:

$$Y_t = \alpha + \beta X_t + e_t \text{-----} (1)$$

Where:

Y_t = dependent value

α , = drift/intercept component

X_t = the independent value

e_t = white noise errors.

To test long-run relationship existence, Pesaran et al (2001) develop an estimation model called the bounds test, and, to implement the bounds test, equation (1) is used as a conditional ARDL-ECM:

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^p \beta_i \Delta Y_{t-i} + \sum_{i=1}^{q_1} \sigma_i \Delta X_{t-i} + \lambda_1 Y_{t-1} + \lambda_2 X_{t-1} + U_t \text{-----} (2)$$

Where:

Y_t = vector and dependent variable which is explained by its lagged values including the current and lag values of the regressors. (Y_t Being a vector implies that all the variables that make up the model can also be used as dependent variables);

X_t = regressors which are allowed to be purely I (0) and I (1) or cointegrated;

α_0 = Intercept/constant in the model;

ϕ, ψ = coefficients representing the short-run dynamics of the model;

λ = coefficients representing the long-run relationships;

p and q = optimal lag values (where p represents the lag values of the dependent variable, and, q the lag values of the regressors); and

U_t = vector of error terms with unobservable zero-mean white noise vector process (serially uncorrelated).

This approach estimates equation two (2) by an OLS to test for the existence of a long-run relationship among the variables through the conduct of an F-test for the joint significance of the coefficients of the lagged levels of the variables. Since the F- test may be sensitive to the order of lags, the researcher chooses the optimal lag length (with a maximum rank of 4) under the AIC before carrying out the F-test.

With the optimal lag, the calculated F-statistic values were compared with the upper and lower bounds critical values. If the calculated F-statistic is greater than the critical value of the upper-bounds, we reject the null hypothesis of no cointegration irrespective of whether the variable is I(0) or I(1); on the other hand, if the calculated F-statistic is below the critical value of the lower-bounds, we fail to reject the null hypothesis of no cointegration. However, if the F-statistic falls between the upper-bound and lower-bound values, then the test is inconclusive. The results of the ARDL/Bounds cointegration tests were analyzed and presented in the next chapter of this paper.

3.4 Error Correction Model (ECM)

The ECM as a component of the ARDL model is used to obtain the short-run dynamic parameters by estimating errors associated with the long-run estimates. If the variables are I (1) and there exists a cointegration relationship, then the ECM can be derived.

To illustrate the ECM modeling approach, let us consider the following bivariate relationship:

$$Y_t = \mu + \beta_1 X_t + \varepsilon_t \text{-----} (3)$$

From equation three (3), the cointegration between y_t and X_t are now as follows:

$$\varepsilon_t = Y_t - \mu - \beta_1 X_t \text{-----} (4)$$

And the Error Correction Model for y_t is as follows:

$$\Delta y_t = a_{0x} + \sum_{h=1}^l a_{1h} \Delta Y_{t-h} + \sum_{h=1}^l b_{1h} \Delta X_{t-h} + \vartheta ECT_{t-1} + u_{yt} \text{-----} (5)$$

Where

$\vartheta = (1 - \sum_{i=1}^p \delta_i)$, the speed of adjustment parameter with a negative sign which measures the speed of adjustment of y_t towards the long-run equilibrium. It describes how deviations from that long-run relationship affect the changes in them in the next period.

ECT = error correction term is the extracted residuals from the regression of the long-run equation which give the estimated long-run relationship among the variables;

a_{1h} , and b_{1h} are the short-run dynamic coefficients of the model's adjustment long-run equilibrium

u_{yt} = stationary white noise process for some number of lags l.

3.5 Diagnostic tests conducted

To make the estimated model robust and unbiased, the researcher determined the fitness of the model through the following diagnostic tests: The Durbin Watson (DW) statistic for serial correlation/non-autocorrelation of residuals, Breusch-Pagan White's test for heteroscedasticity, Shapiro-Wilk W test for Normality, Ramsey RESET specification test for functional misspecification. Additionally, the researcher used the CUMSUM method to check the stability of long-run and short-run coefficient estimates.

3.6 Model Specification

3.6.1 Model One: Impact of tax reforms on tax revenue

The objective of this model was to investigate the impacts of tax reforms on revenue mobilization in which tax revenue is specified as a function of the Active Labor Force, Gross Fixed Capital Formation, Trade, and the reformed dummy. To reduce the risk of attributing explanatory power to them which was not responsible for the occurrence of variation in the tax revenue, the Active Labor Force, Gross Fixed Capital Formation, and Trade are used as controlled variables.

This association is given in the form of a log-linear empirical model that can be specified as:

$$LTREV = \alpha_0 + \alpha_1 LALF + \alpha_2 LDINV + \alpha_3 LTRD + \alpha_4 RDummy + \mu \text{-----} (6)$$

Where L represents the natural logarithm; TREV denotes the tax revenue; ALF represents the Active Labor Force; DINV represents Gross Fixed Capital Formation; TRD represents Trade; and, RDummy represents Reformed Dummy variable taking 0 before the reforms which started in 2003 and 1 after the reforms, and μ is a standard error term.

Using the Bounds test approach to cointegration, the following ARDL-ECM was estimated to test the cointegration relationship between Tax Revenue, Active Labor Force, Gross Fixed Capital Formation, Trade, and RDummy:

$$\begin{aligned} \Delta LTREV_t = & \alpha_0 + \alpha_1 LTREV_{t-1} + \alpha_2 LALF_{t-1} + \alpha_3 LDINV_{t-1} + \alpha_4 LTRD_{t-1} + \\ & \sum_{i=1}^p \phi_i \Delta LTREV_{t-i} + \sum_{j=0}^{q_1} \phi_j \Delta LALF_{t-j} + \sum_{k=0}^{q_2} \phi_k \Delta LDINV_{t-k} + \sum_{l=0}^{q_3} \phi_l \Delta LTRD_{t-l} + \\ & RdUMMY + \varepsilon_t \text{-----} (7) \end{aligned}$$

Where Δ denotes the difference operator, α_0 represents the intercept, and, $\alpha_1, \dots, \alpha_4$ are the long-run multipliers. Equation seven (7) was estimated by an OLS method to test the existence of a long-run relationship among the variables through the conduct of an F-test for the joint significance of the coefficients of the lagged levels of the variables, that is:

$$H_0: \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0 \text{ against the alternative}$$

$$H_1: \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq 0$$

Since cointegration was established after performing the bounds tests for LTREV, the conditional ARDL (p, q_1, q_2, q_3) long-run model for $LTREV_t$ is estimated by an ECM and the short-run dynamic parameters associated with the long-run estimates were obtained through the following specification:

$$\Delta LTREV_t = \mu + \sum_{i=1}^p \phi_i \Delta LTREV_{t-i} + \sum_{j=0}^{q_1} \lambda_j \Delta LALF_{t-j} + \sum_{k=0}^{q_2} \sigma_k \Delta LDINV_{t-k} + \sum_{l=0}^{q_3} \rho_l \Delta LTRD_{t-l} + \vartheta ecm_{t-1} + Rdummy + \varepsilon_t \text{-----} (8)$$

Where

ϕ, λ, σ are the short-run dynamic coefficients of the model's adjustment long-run equation (convergence to equilibrium);

$\vartheta = (1 - \sum_{i=0}^p \delta_i)$, speed of adjustment parameter; (the statistically significant and negative sign of ecm_{t-1} coefficient ϑ , implies that any long-run disequilibrium among dependent variables and several independent variables will converge back to the long-term equilibrium association.);

$\vartheta ecm_{t-1} = (LTREV_{t-i} - \phi X_t)$, is the error correction term or the extracted residual from the regression of the long-run equation; and,

$\phi_i = (\sum_{i=0}^q \beta_i) / \mu$, long-run parameter

3.6.2 Model Two: Effect of reform induced-tax revenue on the Real GDP

The Real Gross Domestic Product (RGDP) was used as a proxy for the rate of growth of the Sierra Leone economy. The predicted value of Tax Revenue, nominal Exchange Rate, Inflation Rate, and, Foreign Direct Investment are the explanatory variables used in this model. To link the two models, the paper uses the fitted value of tax revenue from model one as one of the independent variables to estimate model two.

Following Engen and Skinner (1996), this association is given in the form of a log-linear empirical model that was specified as:

$$LRGDP = \beta_0 + \beta_1 LTREVF + \beta_2 LEXR + \beta_3 LINF + \beta_4 LFDI + u_i \text{-----} (9)$$

Where L represents the natural logarithm; RGDP represents real gross domestic product; TREVF denotes the fitted value of Tax Revenue; EXR represents nominal Exchange Rate; INF

represents the Inflation Rate (average annual % change consumer price index); FDI represents the Foreign Direct Investment (net inflows), and, u_i represent the error term which is assumed to be identically and independently normally distributed with zero-mean.

Using the Bounds test approach to cointegration, the following ARDL-ECM was estimated to test the cointegration relationship between Real Gross Domestic Product, the fitted value of Tax Revenue, Exchange Rate, Inflationary Rate, and Foreign Direct Investment:

$$\Delta LR GDP_t = \beta_0 + \beta_1 LR GDP_{t-1} + \beta_2 LTREVF_{t-1} + \beta_3 LEXR_{t-1} + \beta_4 LINF_{t-1} + \beta_5 LFDI_{t-1} + \sum_{i=1}^p \gamma_i \Delta LR GDP_{t-i} + \sum_{j=0}^{q_1} \gamma_j \Delta LTREVF_{t-j} + \sum_{k=0}^{q_2} \gamma_k \Delta LEXR_{t-k} + \sum_{l=0}^{q_3} \gamma_l \Delta LINF_{t-l} + \sum_{m=0}^{q_4} \gamma_m \Delta LFDI_{t-m} \text{-----} (10)$$

Where Δ denotes the difference operator, β_0 represents the intercept, and, $\beta_1 \dots \beta_5$ are the long-run multipliers. Equation ten (10) was estimated by an OLS method to test the existence of a long-run relationship among the variables through the conduct of an F-test for the joint significance of the coefficients of the lagged levels of the variables, that is:

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0 \text{ against the alternative}$$

$$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$$

Since cointegration was established after performing the bounds tests for LR GDP, the conditional ARDL (p, q_1, q_2, q_3, q_4) long-run model for $LR GDP_t$ is estimated by an ECM and the short-run dynamic parameters associated with the long-run estimates were obtained through the following specification:

$$\Delta LR GDP_t = \alpha + \sum_{i=1}^p \varphi_i \Delta LR GDP_{t-i} + \sum_{j=0}^{q_1} \omega_j \Delta LTREVF_{t-j} + \sum_{k=0}^{q_2} \lambda_k \Delta LEXR_{t-k} + \sum_{l=0}^{q_3} \sigma_k \Delta LINF_{t-l} + \sum_{m=0}^{q_4} \rho_l \Delta LFDI_{t-m} + \vartheta ec m_{t-1} + \varepsilon_t \text{-----} (11)$$

Where

$\varphi, \omega, \lambda, \sigma, \rho$ = the short-run dynamic coefficients of the model's convergence to equilibrium;

$\vartheta = (1 - \sum_{i=0}^p \delta_i)$, speed of adjustment parameter; (the statistically significant and negative sign of ecm_{t-1} coefficient ϑ , implies that any long-run disequilibrium among dependent variables and several independent variables will converge back to the long-term equilibrium association.);

$\vartheta ecm_{t-1} = (Lrgdp_{t-1} - \phi X_t)$, is the error correction term or the extracted residual from the regression of the long-run equation; and

$\varphi = (\sum_{i=0}^q \beta_i) / \alpha$, long-run parameter

3.6.3 Model Three: Effect of tax reform on the different tax handles

3.6.3.1 Effect of the tax reform on Income Tax (ITAX)

Income Tax was used as a proxy for Corporate Tax, PAYE, GST, CGT, Domestic Excise, W/H Taxes, and Payroll Tax. The Active Labor Force, Gross Fixed Capital Formation, and Trade are used as controlled variables. This association is given in the form of a log-linear empirical model that was specified as:

$$LITAX = \alpha_0 + \alpha_1 LALF + \alpha_2 LDINV + \alpha_3 LTRD + \alpha_4 RDummy + \mu \text{-----} (12)$$

Where L denotes natural logarithm, ITAX represents Income Tax, ALF denotes active labor force, DINV represent Gross Fixed Capital Formation, TRD represent Trade, and RDummy denotes the reform dummy variable taking 0 before the reforms which started in 2003 and 1 after the reforms, and μ is a standard error term.

Using the Bounds test approach to cointegration, the following ARDL-ECM was estimated to test the cointegration relationship between Income Tax, Active Labor Force, Gross Fixed Capital Formation, Trade, and RDummy:

$$\begin{aligned} \Delta LITAX_t = & \alpha_0 + \alpha_1 LITAX_{t-1} + \alpha_2 LALF_{t-1} + \alpha_3 LDINV_{t-1} + \alpha_4 LTRD_{t-1} + \\ & \sum_{i=1}^p \phi_i \Delta LITAX_{t-i} + \sum_{j=0}^{q_1} \phi_j \Delta LALF_{t-j} + \sum_{k=0}^{q_2} \phi_k \Delta LDINV_{t-k} + \sum_{l=0}^{q_3} \phi_l \Delta LTRD_{t-l} + \\ & RdUMMY + \varepsilon_t \text{-----} (13) \end{aligned}$$

Where Δ denotes the difference operator, α_0 represents the intercept, and, $\alpha_1, \dots, \alpha_4$ are the long-run multipliers. Equation thirteen (13) was estimated by an OLS method to test the existence of a long-run relationship among the variables through the conduct of an F-test for the joint significance of the coefficients of the lagged levels of the variables, that is:

$H_0: \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$ against the alternative

$H_1: \alpha_1 \neq \alpha_2 \neq \beta_3 \neq \alpha_4 \neq 0$

Since no long-run cointegration was established after performing the bounds tests for LITAX, the short-run model for $LITAX_t$ is estimated by an ARDL and the parameters were obtained through the following specification:

$$\Delta LITAX_t = \alpha_0 + \alpha_1 LITAX_{t-1} + \alpha_2 LALF_{t-1} + \alpha_3 LDINV_{t-1} + \alpha_4 LTRD_{t-1} + RdUMMY + \varepsilon_t \quad (14)$$

3.6.3.2 Effect of the tax reform on Goods and Services Tax (GST)

The Goods and Services Tax was used as a proxy for import sales tax, domestic sales tax, entertainment tax, restaurant tax, food tax, message tax, hotel accommodation tax, and professional services tax. The Active Labor Force, Gross Fixed Capital Formation, and Trade are used as controlled variables. This association is given in the form of a log-linear empirical model that was specified as:

$$LGST = \alpha_0 + \alpha_1 LALF + \alpha_2 LDINV + \alpha_3 LTRD + \alpha_4 RDummy + \mu \quad (15)$$

Where L denotes natural logarithm, GST represents the Goods and Services Tax, ALF denotes active labor force, DINV represent Gross Fixed Capital Formation, TRD represent Trade, and RDummy denotes the reform dummy variable taking 0 before the reforms which started in 2003 and 1 after the reforms, and μ is a standard error term.

Using the Bounds test approach to cointegration, the following ARDL-ECM was estimated to test the cointegration relationship between the Goods and Services Tax, Active Labor Force, Gross Fixed Capital Formation, Trade, and RDummy:

$$\begin{aligned} \Delta LGST_t = & \alpha_0 + \alpha_1 LGST_{t-1} + \alpha_2 LALF_{t-1} + \alpha_3 LDINV_{t-1} + \alpha_4 LTRD_{t-1} + \sum_{i=1}^p \phi_i \Delta LGST_{t-i} + \\ & \sum_{j=0}^{q_1} \phi_j \Delta LALF_{t-j} + \sum_{k=0}^{q_2} \phi_k \Delta LDINV_{t-k} + \sum_{l=0}^{q_3} \phi_l \Delta LTRD_{t-l} + RdUMMY + \varepsilon_t \quad (16) \end{aligned}$$

Where Δ denotes the difference operator, α_0 represents the intercept, and, $\alpha_1, \dots, \alpha_4$ are the long-run multipliers. Equation sixteen (16) was estimated by an OLS method to test the existence

of a long-run relationship among the variables through the conduct of an F-test for the joint significance of the coefficients of the lagged levels of the variables, that is:

$H_0: \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$ against the alternative

$H_1: \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq 0$

Since no long-run cointegration was established after performing the bounds tests for LGST, the short-run model for $LGST_t$ is estimated by an ARDL and the parameters were obtained through the following specification:

$$\Delta LGST_t = \alpha_0 + \alpha_1 LGST_{t-1} + \alpha_2 LALF_{t-1} + \alpha_3 LDINV_{t-1} + \alpha_4 LTRD_{t-1} + RdUMMY + \varepsilon_t \text{-----} (17)$$

3.6.3.3 Effect of the tax reform on Non-Tax Revenue (NTR)

The Non-Tax Revenue was used as a proxy for Royalty payments in both the mining sector and the agricultural sector, licenses. The Active Labor Force, Gross Fixed Capital Formation, and Trade are used as controlled variables. This association is given in the form of a log-linear empirical model that was specified as:

$$LNTR = \alpha_0 + \alpha_1 LALF + \alpha_2 LDINV + \alpha_3 LTRD + \alpha_4 RDummy + \mu \text{-----} (15)$$

Where L denotes natural logarithm, NTR represents Non-Tax Revenue, ALF denotes Active Labor Force, DINV represent Gross Fixed Capital Formation, TRD represent Trade, and RDummy denotes the reform dummy variable taking 0 before the reforms which started in 2003 and 1 after the reforms, and μ is a standard error term.

Using the Bounds test approach to cointegration, the following ARDL-ECM was estimated to test the cointegration relationship between the Non-Tax Revenue, Active Labor Force, Gross Fixed Capital Formation, Trade, and RDummy:

$$\Delta LNTR_t = \alpha_0 + \alpha_1 LNTR_{t-1} + \alpha_2 LALF_{t-1} + \alpha_3 LDINV_{t-1} + \alpha_4 LTRD_{t-1} + \sum_{i=1}^p \phi_i \Delta LNTR_{t-i} + \sum_{j=0}^{q_1} \phi_j \Delta LALF_{t-j} + \sum_{k=0}^{q_2} \phi_k \Delta LDINV_{t-k} + \sum_{l=0}^{q_3} \phi_l \Delta LTRD_{t-l} + RdUMMY + \varepsilon_t \text{-----} (16)$$

Where Δ denotes the difference operator, α_0 represents the intercept, and, $\alpha_1, \dots, \alpha_4$ are the long-run multipliers. Equation sixteen (16) was estimated by an OLS method to test the existence of a long-run relationship among the variables through the conduct of an F-test for the joint significance of the coefficients of the lagged levels of the variables, that is:

$H_0: \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$ against the alternative

$H_1: \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq 0$

Since cointegration was established after performing the bounds tests for LNTR, the conditional ARDL (p, q_1, q_2, q_3, q_4) long-run model for $LNTR_t$ is estimated by an ECM and the short-run dynamic parameters associated with the long-run estimates were obtained through the following specification:

$$\Delta LNTR_t = \mu + \sum_{i=1}^p \phi_i \Delta LNTR_{t-i} + \sum_{j=0}^{q_1} \lambda_j \Delta LALF_{t-j} + \sum_{k=0}^{q_2} \sigma_k \Delta LDINV_{t-k} + \sum_{l=0}^{q_3} \rho_l \Delta LTRD_{t-l} + \vartheta ecm_{t-1} + Rdummy + \varepsilon_t \text{-----} (17)$$

Where

ϕ, λ, σ are the short-run dynamic coefficients of the model's adjustment long-run equation (convergence to equilibrium);

$\vartheta = (1 - \sum_{i=0}^p \delta_i)$, speed of adjustment parameter; (the statistically significant and negative sign of ecm_{t-1} coefficient ϑ , implies that any long-run disequilibrium among dependent variables and several independent variables will converge back to the long-term equilibrium association.);

$\vartheta ecm_{t-1} = (LNTR_{t-i} - \phi X_t)$, is the error correction term or the extracted residual from the regression of the long-run equation; and,

$\phi_i = (\sum_{i=0}^q \beta_i) / \mu$, long-run parameter

3.6.3.4 Effect of the tax reform on International Trade Tax (ITrTAX)

International trade tax was used as a proxy for Import Duty, Export Charges, and other Customs Charges excluding Road User Charge, ECOWAS Levy, and Withholding 3% Income Tax. The Active Labor Force, Gross Fixed Capital Formation, and Trade are used as controlled variables. This association is given in the form of a log-linear empirical model that was specified as:

$$LITrTAX = \alpha_0 + \alpha_1 LALF + \alpha_2 LDINV + \alpha_3 LTRD + \alpha_4 RDummy + \mu \text{-----} (18)$$

Where L denotes natural logarithm, ITrTAX represent International Trade Tax, ALF denotes active labor force, DINV represent Gross Fixed Capital Formation, TRD represent Trade, and RDummy denotes the reform dummy variable taking 0 before the reforms which started in 2003 and 1 after the reforms, and μ is a standard error term.

Using the Bounds test approach to cointegration, the following ARDL-ECM was estimated to test the cointegration relationship between International Trade Tax, Active Labor Force, Gross Fixed Capital Formation, Trade, and RDummy:

$$\begin{aligned} \Delta LITrTAX_t = & \alpha_0 + \alpha_1 LITrTAX_{t-1} + \alpha_2 LALF_{t-1} + \alpha_3 LDINV_{t-1} + \alpha_4 LTRD_{t-1} + \\ & \sum_{i=1}^p \phi_i \Delta LITrTAX_{t-i} + \sum_{j=0}^{q_1} \phi_j \Delta LALF_{t-j} + \sum_{k=0}^{q_2} \phi_k \Delta LDINV_{t-k} + \sum_{l=0}^{q_3} \phi_l \Delta LTRD_{t-l} + \\ & RdUMMY + \varepsilon_t \text{-----} (19) \end{aligned}$$

Where Δ denotes the difference operator, α_0 represents the intercept, and $\alpha_1, \dots, \alpha_4$ are the long-run multipliers. Equation nineteen (19) was estimated by an OLS method to test the existence of a long-run relationship among the variables through the conduct of an F-test for the joint significance of the coefficients of the lagged levels of the variables, that is:

$H_0: \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$ against the alternative

$H_1: \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq 0$

Since no long-run cointegration was established after performing the bounds tests for LITrTAX, the short-run model for $LITrTAX_t$ is estimated by an ARDL and the parameters were obtained through the following specification:

$$\begin{aligned} \Delta LITrTAX_t = & \alpha_0 + \alpha_1 LITAX_{t-1} + \alpha_2 LALF_{t-1} + \alpha_3 LDINV_{t-1} + \alpha_4 LTRD_{t-1} + RdUMMY + \varepsilon_t \text{-----} \\ & \text{-----} (20) \end{aligned}$$

3.7 Estimation Method

To establish the long-run and short-run relationships among the variables of interest, the study employed the Bounds test approach to cointegration and ARDL-ECM proposed by Pesaran et al. (2001). The F-Statistic, with information summarized in the P-Probability, was used to test for the significance of each variable in the two models, but more importantly the significance of tax revenue on the real GDP of Sierra Leone.

To determine whether our variables of interest are stationary, the Augmented Dickey-Fuller (ADF) and the Zivot Andrews unit root test statistics were employed to analyze the time-series properties of our data set. The study performed diagnostic tests in the case of each model. The diagnostic tests include the Durbin Watson (DW) statistic for serial correlation/non-autocorrelation of residuals; Breusch-Pagan test for heteroscedasticity; Shapiro-Wilk test for Normality; and the Ramsey RESET test for functional misspecification. Finally, the study used the CUMSUM test to check the stability of long-run and short-run coefficient estimates.

Table 2: Definition of Variables

3.8 Definition of Variables

No	Variable		Definition	Measurement	Expected Sign
1	Active Force	Labor	Ages 15-64 including people who are currently employed and people who are unemployed but seeking work as well as first-time job-seekers.	Million	+
2	Trade		The value of all goods and other market services provided to and receive from the rest of the world.	USD	+
3	Real GDP		Nominal GDP at CPI divided by the GDP deflator	USD	+
4	Foreign Investment	Direct Investment	Direct investment equity flows in Sierra Leone.	USD	+
5	Gross Capital Formation	Fixed	Outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.	USD	+
6	Nominal exchange rate		The rate at which the Leone is officially exchanged for the USD	Le	±
7	Inflation rate(CPI)		Annual percentage change in the cost of acquiring a basket of commodities	%	±
8	Tax revenue		Money collected by tax authorities through the imposition of levies and taxes on facilities, incomes, sale of goods and services, transfers of properties, and other domestic/international transactions	USD	+
9.	Tax Reforms		The changes in the structure of one or more taxes or the entire tax system undertaken by the Sierra Leone government		+
10	Income Tax		Taxes on income, profits, and capital gains	USD	+
11	Goods and Services Tax		It Is a value-added tax levied on most goods and services sold for domestic consumption.	USD	+
12	Non-Tax Revenue		This refers to money collected from royalties, licenses, fees, and other revenue related charges	USD	+
13	International Trade Tax		Customs duties and other charges on imports and exports	USD	+

3.9 Data Source

This study employed the Sierra Leone annual time series data from 1981 to 2018. Except for Tax revenue data which was extracted from the Sierra Leone National Revenue Authority database and the International Center for Tax and Development, all the other data were obtained from the World Bank and IMF Development Indicators 2020. Other sources of data include but not limited to the following: Bank of Sierra Leone publications, Statistics Sierra Leone, National Mineral Agency, Ministry of Finance, Theses, and Publications, etc.

CHAPTER FOUR

4. Empirical Results and Analysis

4.1 Introduction

To investigate the effects of tax reforms on tax revenue and the effect of the induce reform tax revenue on economic growth, a model of tax revenue, a model of real GDP, and a model for the respective tax handles were estimated. Following this, we discuss the results of the estimated models.

4.2 Empirical Results

4.2.1 Unit Root Tests

Although the ARDL framework does not require pre-testing of variables, the unit root test could tell the researcher about the order of integration for each variable and, whether the ARDL model should be used or not. As Quattara (2004) argues that in the presence of $I(2)$ variables, the computed F statistics provided by Pesaran et al (2001) are not invalid because the bound test is assumed that the variables are $I(0)$ or $I(1)$. Hence, the implementation of the unit root test in the ARDL-ECM procedure is necessary for ensuring that none of the variables are $I(2)$ or beyond. In this study, the researcher employed the ADF, and, Zivot Andrews' unit root tests to determine the stationarity of the series.

4.2.1.1 Augmented Dickey-Fuller Unit Root Test Analysis

Except otherwise if the variables are cointegrated, the presence of unit root in economic and financial data gives rise to the problem of spurious regression that renders the OLS estimator to be biased, the t-statistic, and the p-value to be unreliable. Thus, implying that the variables are non-stationary.

Non-stationary time series data can however be made stationary by differencing. A formal test for unit root was conducted on each variable to determine their stationary properties. The test regressions included both constant and trend for the log-level and first difference of the variables. In the ADF tests, the null hypothesis of unit root is rejected if the test statistic is more negative than the critical value. The results are presented in table three (3) below:

Table3: Augmented Dickey-Fuller Unit Root Test Result

Variable (Log)	At level t-stat	Critical value (5%)	Conclusion	First difference t-stat	Critical value (5%)	Conclusion
RGDP	-3.132	-3.556	Non-Stationary	-4.524	-2.975	Stationary
ALF	-1.974	-3.556	Non-Stationary	-6.380	-2.969	Stationary
FDI	-2.641	-2.969	Non-Stationary	-5.492	-2.972	Stationary
TRD	-2.631	-3.556	Non-Stationary	-6.061	-2.969	Stationary
EXR	-4.553	-3.564	Stationary	-2.904	-2.972	Stationary
TREV	-3.608	-3.556	Stationary	-5.049	-2.969	Stationary
INF	-1.878	-2.972	Non-Stationary	-4.989	-2.972	Stationary
DINV	-2.692	-3.564	Non-Stationary	-5.202	-2.975	Stationary
ITAX	-2.407	-3.556	Non-Stationary	-3.737	-2.972	Stationary
GST	-3.354	-3.560	Non-Stationary	-4.221	-3.564	Stationary
NTR	-3.592	-3.564	Stationary	-4.439	-3.568	Stationary
INTTrTAX	-3.998	-3.556	Stationary	-6.320	-3.560	Stationary

The results presented in Table 3 show that except for Exchange Rate (EXR), Tax Revenue (TREV), Income Tax (ITAX), and Goods and Services Tax (GST), all other variables have a unit root at levels implying that they are non-stationary at levels, but only become stationary at first difference. Suggesting that Exchange Rate (EXR), Tax Revenue (TREV), Income Tax (ITAX), and the Goods and Services (GST) were integrated of order zero (I(0)) while the rest of the variables are integrated of order one (I(1)). Implying that the variables used in this study have a mixed combination of I(0) and I(1).

4.2.1.2 Zivot Andrews Unit Root Test Analysis

A problem common with the ADF test is that it does not allow for the possibility of a structural break. Assuming the time of the break as an exogenous phenomenon, Perron showed that the power to reject a unit root decreases when the stationary alternative is true and a structural break is ignored. Zivot and Andrews propose a variation of Perron's original test in which they assume that the exact time of the break-point is unknown, instead, a data-dependent algorithm is used to proxy Perron's subjective procedure to determine the breakpoints. As explained by Piehl et al., (1999), the idea of a breakpoint is central for an accurate evaluation of any program intended to bring about structural changes; such as tax reforms, banking sector reforms, and regime shifts, etc.

An important aspect of unit root estimation in the presence of structural break is the trend property of the variables. Ben-David and Papell (1997) show that if there is no upward trend in data, the test power to reject the no-break null hypothesis is reduced as the critical values increase with the inclusion of a trend variable. In contrast, if series shows a trend, then estimating the model without a trend may fail to capture some significant characteristics of the data. Besides, the reason for testing for unit root with a structural break is that a variable can be stationary at levels but because of the presence of structural break, the traditional ADF test will indicate that the variable has a unit root at levels when there is no unit root. The results of the Zivot Andrews' unit root test are presented in table four (4) below:

Table 4: Zivot Andrews' Unit Root Test Result

Variable(Log)	Year	Test Statistic (At Level)	Conclusion	Test Statistic (First Difference)	Year	Conclusion
RGDP	2003	-5.400	Stationary	-11.874	2005	Stationary
ALF	1990	-18.960	Stationary	-8.708	1992	Stationary
FDI	1995	-5.962	Stationary	-8.835	1991	Stationary
TRD	1997	-3.821	Non-stationary	-7.256	1989	Stationary
EXR	1989	-5.255	Stationary	-6.651	1993	Stationary
TREV	1997	-3.908	Non-stationary	-6.169	1989	Stationary
INF	2000	-6.289	Stationary	-9.514	2003	Stationary
DINV	1997	-7.315	Stationary	-7.591	1998	Stationary
ITAX	1990	-5.242	Stationary	-7.175	1988	Stationary
GST	1989	-4.717	Non-stationary	-8.475	1998	Stationary
NTR	1987	-7.836	Stationary	-6.960	1999	Stationary
INTRTAX	1996	-4.976	Non-stationary	-8.643	1998	Stationary

Asymptotic critical values at 5%: -5.08

From Table 4, the Zivot Andrews test shows that while the Real Gross Domestic Product (RGDP), the Active Labor Force (ALF), Foreign Direct Investment (FDI), the Exchange Rate (EXR), the rate of Inflation (INF), the Gross Fixed Capital Formation (DINV), Income Tax (ITAX), and Non-Tax Revenue (NTR) are stationary at levels, Trade (TRD), and, Tax Revenue (TREV), Goods and Services Tax (GST), and International Trade Taxes (INTRTAX) are only stationary after first differencing. This result contradicts the findings obtained from the ADF unit root test as TREV and INTRTAX were stationary at levels but nonstationary with a structural break test. At the same time, the test identifies endogenously the point of the single most significant structural break in the Tax Revenue and Trade time series examined in this paper. In the year 1996, despite the civil war which lasted for eleven years, there was a change of political

leadership from the military junta to the first-ever democratically- elected government in the country which have necessitated a policy shift in international trade. In 1997, however, the newly elected government was overthrown leading to political instability.

4.2.2 Lag length criteria determination

Before the use of the ARDL/Bounds test to cointegration approach, it is necessary to choose the appropriate lag length. The choice of lag length was carefully done, as inappropriate lag length can lead to biased results and cannot be accepted for policy analysis. To select the optimal lag length, the researcher used Akaike's Information Criteria (AIC) because the AIC criterion gives robust results and has excellent performance relative to the HQIC and SBIC, and, consequently, the researcher determined that lag 4 fits the sample size.

Table 5: VAR lag-order selection criteria for Tax Revenue

Lag	LL	SR	FPE	AIC	HQIC	SBIC
0	-125.27	n/a	0.001465	7.66312	7.73967	7.88759
1	-24.235	202.08	0.000017	3.19026	3.64956	4.53705*
2	-13.326	21.817	0.000043	4.01919	4.86123	6.4883
3	34.715	96.082	0.000015	2.66383	3.88861	6.25527
4	73.472	77.513*	.000012*	1.85461*	3.46214*	6.56837

Endogenous: Ltrev Lalf Ldinv Ltrd dum_2003

Notes: SR denotes for sequential modified LR test statistic (each test at 5 percent level); FPE denotes the final prediction error. *Denotes the lag order selected by the criterion

Table 6: VAR lag-order selection criteria for Real GDP

Lag	LL	SR	FPE	AIC	HQIC	SBIC
0	-211.52	n/a	0.233851	12.7362	12.8128	12.9607
1	-72.651	277.73	0.000294	6.03829	6.49758	7.38508
2	-58.983	27.336	0.000634	6.70487	7.54691	9.17399
3	7.03997	132.05	0.000075	4.29177	5.51655	7.8832
4	94.7077	175.34*	3.6e-06*	.605428*	2.21295*	5.31919*

Endogenous: Lrgdp LtrevF Lexr Linf Lfdi

Notes: SR denotes for sequential modified LR test statistic (each test at 5 percent level); FPE denotes the final prediction error. *Denotes the lag order selected by the criterion

Table 7: VAR lag-order selection criteria for LITAX

Lag	LL	SR	FPE	AIC	HQIC	SBIC
0	- 168.904		.01907	10.2297	10.3062	10.4541
1	-55.399	227.01	.000107	5.02352	5.48281	6.37031*
2	-37.778	35.244	.000182	5.45753	6.29957	7.92664
3	-13.627	48.302	.000254	5.50747	6.73225	9.0989
4	46.9246	121.1*	.000059*	3.4162*	5.02373*	8.12996

Endogenous: LITAX Lalf Ldinv Ltrd dum_2003, Exogenous: Constant

Notes: SR denotes for sequential modified LR test statistic (each test at 5 percent level); FPE denotes the final prediction error. *Denotes the lag order selected by the criterion

Table 8: VAR lag-order selection criteria for LGST

Lag	LL	SR	FPE	AIC	HQIC	SBIC
0	-222.87		.456165	13.4044	13.4809	13.6289
1	-120.38	204.98	.004871*	8.84618	9.30548*	10.193*
2	-98.263	44.244	.006388	9.01548	9.85751	11.4846
3	-76.929	42.668	.010505	9.23112	10.4559	12.8226
4	-32.845	88.167*	.006439	8.10856*	9.71608	12.8223

Endogenous: LGST Lalf Ldinv Ltrd dum_2003; Exogenous: Constant

Notes: SR denotes for sequential modified LR test statistic (each test at 5 percent level); FPE denotes the final prediction error. *Denotes the lag order selected by the criterion

Table 9: VAR lag-order selection criteria for LNTR

Lag	LL	SR	FPE	AIC	HQIC	SBIC
0	-178.16		.03287	10.7741	10.8507	10.9986
1	-83.456	189.41	.000555	6.67388	7.13318	8.02067*
2	-62.144	42.623	.000763	6.89085	7.73288	9.35996
3	-40.675	42.939	.001245	7.09854	8.32332	10.69
4	26.3011	133.95*	.000199*	4.62935*	6.23688*	9.34311

Endogenous: LNTR Lalf Ldinv Ltrd dum_2003; Exogenous: Constant

Notes: SR denotes for sequential modified LR test statistic (each test at 5 percent level); FPE denotes the final prediction error. *Denotes the lag order selected by the criterion

Table 10: VAR lag-order selection criteria for LINTax

Lag	LL	SR	FPE	AIC	HQIC	SBIC
0	-222.01		.433742	13.354	13.4305	13.5785
1	-118.66	206.7	.004403*	8.74526	9.20455*	10.092*
2	-95.603	46.132	.005463	8.85902	9.70105	11.3281
3	-76.584	38.037	.010294	9.21087	10.4356	12.8023
4	-28.569	96.03*	.005007	7.85705*	9.46457	12.5708

Endogenous: LINTax Lalf Ldinv Ltrd dum_2003; Exogenous: Constant

Notes: SR denotes for sequential modified LR test statistic (each test at 5 percent level); FPE denotes the final prediction error. *Denotes the lag order selected by the criterion

4.2.3 ARDL/ Bounds Cointegration Tests

Following the ADF, and Zivot Andrews unit root tests, we observed that the variables have a mixed combination of both I(0) and I(1) series with a combination of both levels and first difference stationarity. The researcher, therefore, estimated equations 8 and 11 through an OLS procedure to examine for the presence of a long-run relationship between real GDP and Tax revenue and their explanatory variables respectively using the Pesaran et al (2001) Bounds test to cointegration approach. The results are presented in Tables 11 and 12 below respectively:

Table11: Bounds Test Cointegration Result for Tax Revenue

Variable	Ltrev	Lalf	Ldinv	Ltrd
Optimal lag structure	(1,2,0,0,0)	(1,0,0,0,0)	(1,1,1,0,0)	(1,1,1,0,0)
F-statistics	21.479	1.124	10.561	1.894
Critical values	5%	5%	5%	5%
Lower bounds I(0)	2.86	2.86	2.86	2.86
Upper bounds I(1)	4.01	4.01	4.01	4.01
Outcome	F>I(1)	F<I(0)	F>I(1)	F<I(0)
Decision	Cointegration	No cointegration	Cointegration	No cointegration
Remarks	Estimate ECM	Estimate ARDL	Estimate ECM	Estimate ARDL

Note: Asymptotic critical bounds are obtained from the regression table, Case III unrestricted intercept and trend

The computed F-statistics for Tax Revenue is 21.479, which is higher than the upper bound critical value at a 5% significance level of (4.01) using the unrestricted intercept and unrestricted trend. So this implies that the null hypothesis of no cointegration can be rejected at 5%. The outcome of the bounds test established that indeed there is a cointegration on Tax Revenue and its explanatory variables which validate the presence of long-run linkage.

Table 12: Bounds Test Cointegration Result for Real GDP

Variable	Lrgdp	LtrevF	Lexr	Linf	Lfdi
Optimal lag structure	(2,0,0,1,0)	(1,0,2,1,0)	(2,0,2,0,0)	(2,1,0,0,0)	(1,0,0,0,0)
F-statistics	9.492	1.958	0.826	5.683	4.971
Critical values	5%	5%	5%	5%	5%
Lower bounds I(0)	2.86	2.86	2.86	2.86	2.86
Upper bounds I(1)	4.01	4.01	4.01	4.01	4.01
Outcome	F>I(1)	F<I(0)	F<I(0)	F>I(1)	F>I(1)
Decision	Cointegration	No cointegration	No cointegration	Cointegration	Cointegration
Remarks	Estimate ECM	Estimate ARDL	Estimate ARDL	Estimate ECM	Estimate ECM

Note: Asymptotic critical bounds are obtained from the regression table, Case III unrestricted intercept, and trend.

The computed F-statistics for Real GDP is 9.492, which is higher than the upper bound critical value at a 5% significance level of (4.01) using the unrestricted intercept and unrestricted trend. Thus, implies that the null hypothesis of no cointegration can be rejected at 5%. The outcome of the bounds test established that indeed there is a cointegration on Real GDP and its explanatory variables which validate the presence of long-run linkage between real GDP and Tax Revenue.

Table 13: Bounds Test for Cointegration Result for the respective Tax Handles

Variable	LTAX	LGST	LNTR	LITrTAX
Optimal lag structure	(1, 0,0,1, 0)	(1,0,1, 0,0)	(2,0,2,2,2)	(1,0,1,0,0)
F-statistics	2.119	3.338	57.557	3.199
Critical values	5%	5%	5%	5%
Lower bounds I(0)	2.86	2.86	2.86	2.86
Upper bounds I(1)	4.01	4.01	4.01	4.01
Outcome	F<I(1)	F<I(1)	F>I(1)	F<I(1)
Decision	No Cointegration	No Cointegration	Cointegration	No cointegration
Remarks	Estimate ARDL	Estimate ARDL	Estimate ECM	Estimate ARDL

Note: Asymptotic critical bounds are obtained from the regression table, Case III unrestricted intercept, and trend.

Using the unrestricted intercept and unrestricted trend, the finding reveals that except for LNTR whose F-statistic is higher than the critical value of its upper bounds, the computed F-statistics for ITAX, LGST, and LITrTax are lower than their upper bound critical values at a 5% significance level. This suggests that the null hypothesis of no cointegration can be rejected at 5% for LNTR. The outcome of the bounds test established that indeed there is a cointegration LNTR and its explanatory variables which validate the presence of long-run linkage between LNTR and the reforms.

4.3 Long-run estimates with short-run dynamic coefficients when Tax Revenue is used as a dependent variable based on the ECM

Having established a cointegrating relationship among Tax Revenue, Active Labor Force, and Gross Fixed Capital Formation, the study then proceeds to estimate the long-run estimates of the short-run dynamic coefficients. Table 13 presents the long-run estimates of the short-run dynamic coefficients when Tax Revenue was used as the dependent variable using the ECM.

Table 14: Long-run estimates with short-run dynamic coefficients when Tax Revenue is used as a dependent variable

Regressor	Coefficient	Standard Error	t-Stat.	Prob(stat)
Adj. Ltrev L1	-0.6224092	0.0777118	-8.01	0.000
LR				
Lalf	0.411886	0.1475049	2.79	0.009
Ldinv	0.0469195	0.0189267	2.48	0.019
Ltrd	0.7520074	0.0852563	8.82	0.000
RDummy	-0.0207955	0.1636549	-0.13	0.900
SR				
Lalf				
LD	-0.2937447	0.1888932	-1.56	0.131
Constant	0.4061497	1.378295	0.29	0.770
Diagnostic Tests	Statistics			
R-squared	0.9756			
Adj. R-squared	0.9694			
Durbin Watson stat	1.793228			
F-statistic	21.479			
Prob(F-statistic)	0.000			
White's test	35.99 (0.3753)			
Shapiro-Wilk W test	0.114(0.455)			
Ramsey RESET test	1.46(0.2461)			

Dependent variable: LTREV (1, 2, 0, 0, 0)

The core observation from Table 14 is that except for the reform dummy, all the variables have the same expected positive signs and are significant in explaining tax revenue in Sierra Leone. Gross Fixed Capital Formation has a minimal effect while Trade has the largest effect on Tax Revenue in the long run. However, in the short run, the coefficient of the Active Labor Force is negative.

Table 14 reveals that the equilibrium error correction term (ECT) is negative (-0.6224092) and statistically significant at the 5% level as expected with the correct sign. The ECT coefficient suggests that about 62% percent of disequilibria from the previous year's shock converge back to the long-run equilibrium in the current year. Apparently, on average, *ceteris paribus*, a percentage change in tax revenue is associated with a 0.62% decline in tax revenue at the 5% level of significance.

Table 14 further indicate that in the long run, a percentage point change in Trade is associated with a 0.75 percent increase in tax revenue, and, a percentage point change in the Active Labor Force is associated with a 0.41 percent increase in Tax Revenue while a percentage point change in Gross Fixed Capital Formation is associated with a 0.05 percent increase in Tax Revenue. In the short run, however, a percentage point change in the Active Labor Force is associated with a 0.29 percent decline in Tax Revenue.

In terms of diagnostics tests, the Shapiro-Wilk test indicates that the data came from a normally distributed population, the DW-statistic of 1.79 shows no evidence of serial correlation suggesting that there is no autocorrelation problem in this model. From the outcome of the White test-statistic of 0.38, we also observed that there is no heteroscedasticity in the model. Using a p-value of 0.05, the RESET statistic of 0.245 shows that there are no omitted variables in this model and is sufficient to explain the relationship between tax revenue and the dependent variable when tested for functional misspecification.

4.4 Long-run estimates with short-run dynamic coefficients when real GDP is used as a dependent variable based on the ECM

Having established a cointegrating relationship among Real GDP, the predicted value of Tax Revenue, Exchange Rate, Inflation, and Foreign Direct Investment, the study proceeds to estimate the long-run estimates of the short-run dynamic coefficients. Table 10 presents the long-run estimates of the short-run dynamic coefficients when real GDP was used as the dependent variable using ECM.

Table 15: Long-run estimates with short-run dynamic coefficients when Real GDP is used as a dependent variable

Regressor	Coefficient	Standard Error	t-Stat.	Prob(stat.)
ADJ. Lrgdp L1	-0.8274654	0.1555384	-5.32	0.000
LR				
LtrevF	0.2865926	0.0620773	4.62	0.000
Lexr	-0.0316246	0.0258208	-1.22	0.231
Linf	-0.2538081	0.1167481	-2.17	0.038
Lfdi	0.0077017	0.0105892	0.73	0.473
SR				
Lrgdp				
LD.	-0.1647988	0.1086818	-1.52	0.141
Linf				
D1.	0.4722055	0.0730331	6.47	0.000
Constant	3.911391	1.024176	3.82	0.001
Diagnostic Tests	Statistics			
R-squared	0.8361			
Adj. R-squared	0.7951			
Durbin Watson stat	2.0529			
F-statistic	9.492			
Prob(F-statistic)	0.000			
White's test	36 (0.4215)			
Shapiro-Wilk W Test	0.114(0.454)			
Ramsey RESET test	1.14(0.237)			

Dependent Variable: LRGDP (2, 0, 0, 1, 0)

The key observation from Table 15 is that both Tax Revenue and Foreign Direct Investment have positive signs as expected at the 5 percent level of significance, while Inflation and Exchange Rate have negative signs in the long run and are significant at the 5 percent level of significance. However, in the short-run, Real GDP is negative, Inflation is positive, and they are statistically significant at the 5 percent level.

From Table 15, the results reveal that the equilibrium error correction term (ECT) is negative (-0.8274654) and statistically significant at the 5 percent level as expected with the correct sign.

The coefficient of the ECT suggests that about 83 percent of disequilibria from the previous year's shock converge back to the long-run equilibrium in the current year. On average, a percentage point change in real GDP is associated with a 0.83 percent decline in real GDP at the 5 percent level in the long run and a 0.16 percent decline in the short run.

Table 15 further reveals that, in the long run, a percentage point change in tax revenue is associated with a 0.29 percent increase in real GDP, while a percentage point change in foreign direct investment is associated with a 0.01 percent increase in real GDP. On the contrary, a percentage point change in the inflation rate is associated with a 0.25 percent decline in real GDP, and, a percentage point change in the exchange rate is associated with a 0.032 percent reduction in real GDP. However, in the short run, a percentage point change in inflation is associated with a 0.47 percent increase in the real GDP, and a percentage point increase in real GDP is associated with a 0.16 percent decline in real GDP.

In terms of diagnostics tests, the Shapiro-Wilk test indicates that the data came from a normally distributed population, the DW statistic of 2.05 indicates evidence of no serial correlation suggesting that this model is not suffering from problems of autocorrelation. The outcome of the White test of 0.42 shows that there is no heteroscedasticity in the model. Using a p-value of 0.05, the RESET statistic of 0.24 shows there are no omitted variables in this model and that the regression model is sufficient to explain the relationship between real GDP and the dependent variables when tested for functional misspecification.

It is worthy to note that regression analysis of time-series data is usually based on the assumption that the regression relationship is constant over time. But in some applications, particularly in social and economic fields, this validity is open to scrutiny, and it is often desirable to examine it critically, particularly if the model is to be used for forecasting, which in this case is not. However, the CUSUM plot indicates that the model is stable as it lies within the five percent boundary.

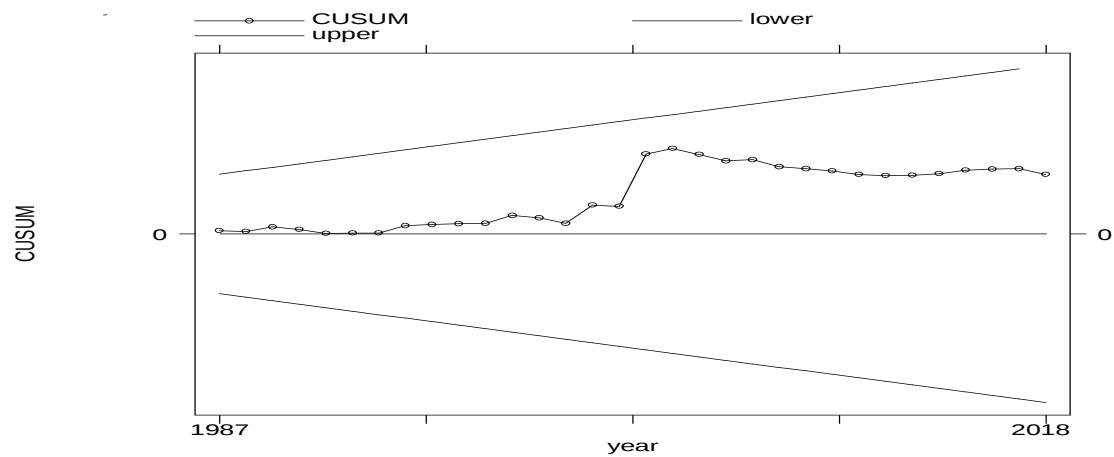


Figure 7: CUSUM statistic plot for economic growth

4.5 Long-run estimates with short-run dynamic coefficients when NTR is used as a dependent variable based on the ECM

Having established a cointegrating relationship among NTR, the Active Labor Force, Gross Fixed Capital Formation, Trade, and the reform dummy, the study proceeds to estimate the long-run estimates of the short-run dynamic coefficients, and the results are presented in Table 16:

Table 16: Long-run estimates with short-run dynamic coefficients when LNTR is used as a dependent variable

Regressor	Coefficient	Standard Error	t-Stat.	Prob(stat.)
Adj. LNTR L1	-0.7084577	0.0526384	-13.46	0.000
Long-Run				
Lalf	3.122731	0.5198299	6.01	0.000
Ldinv	0.8426417	0.0995789	8.46	0.000
Ltrd	0.3553223	0.3357771	1.06	0.301
dum_2003	-0.7127231	0.5469346	-1.3	0.205
Short-Run				
LNTR LD	-0.1230205	0.0374799	-3.280	0.003
Ldinv D1	0.6307225	0.0761641	8.280	0.000
Ltrd LD	-0.7000189	0.3413905	-2.050	0.052
dum_2003 D1	1.485839	0.5940107	2.500	0.020
Constant	-26.32299	5.832736	-4.510	0.000
Diagnostic Tests	Statistics			
R-squared	0.9943			
Adj. R-squared	0.9913			
Durbin Watson stat	1.568198			
F-statistic	57.557			
Prob(F-statistic)	168.32			
White's test	36 (0.4215)			
Shapiro-Wilk W Test				
Ramsey RESET test	2.26 (0.158)			

Dependent Variable: LNTR (2, 0, 2, 2, 2)

The core observation from Table 16 is that except for the reform dummy, all the variables have the same expected positive signs and are significant in explaining Non-Tax Revenue in Sierra Leone in the long run. Trade has a minimal effect while the Active Labor Force has the largest effect on Non-Tax Revenue in the long run. However, in the short run, the coefficient of the Non-Tax Revenue and International Trade were negative.

Table 16 reveals that the ECT is negative (-0.7084577) and statistically significant at the 5% level as expected with the correct sign. The ECT coefficient suggests that about 71 percent of disequilibria from the previous year's shock converge back to the long-run equilibrium in the current year. Apparently, on average, *ceteris paribus*, a percentage change in Non-Tax Revenue is associated with a 0.71 percent decline in Non-Tax Revenue at the 5% level of significance.

Table 16 further indicate that in the long run, a percentage point change in Trade is associated with a 0.36 percent increase in Non-Tax Revenue, and, a percentage point change in the Active Labor Force is associated with a 3.1 percent increase in Non-Tax Revenue while a percentage point change in Gross Fixed Capital Formation is associated with a 0.84 percent increase in Non-Tax Revenue.

In the short run, however, a percentage point change in the Trade is associated with a 0.7 percent decline in Non-Tax Revenue. But a percentage point change in Gross Fixed Capital Formation is with a 0.63 percent increase in Non-Tax Revenue. While a percentage point change in the tax reform is associated with a 1.49 percent increase in the Non-Tax Revenue but a percentage point change in the Non-Tax Revenue is associated with a 0.12 percent decline in the Non-Tax Revenue in the short-run.

4.6 Short-run estimates when ITAX was used as a dependent variable based on the ARDL

Since no long-run cointegrating relationship was established among ITAX, the Active Labor Force, Gross Fixed Capital Formation, Trade, and the reform dummy, the study proceeds to estimate the short-run estimates and the results are presented in Table 17:

Table 17: Short-run estimates for LITAX

Regressor	Coefficient	Standard Error	t-Stat.	Prob(stat.)
LITAX L1	0.8595222	0.0867792	9.900	0.000
Lalf	0.4818275	0.7285976	0.660	0.513
Ldinv	0.0397177	0.0486968	0.820	0.421
Ltrd L1	-0.7999843	0.3866894	-2.070	0.047
dum_2003	0.066604	0.4358068	0.150	0.880
Constant	-5.194748	10.34483	-0.500	0.619
Diagnostic Tests	Statistics			
R-squared	0.9747			
Adj. R-squared	0.9696			
Durbin Watson stat	1.991867			
F-statistic	2.119			
Prob(F-statistic)	192.53			
White's test	34.66 (0.1193)			
Shapiro-Wilk W Test				
Ramsey RESET test	16.29 (0.642)			

Dependent Variable: LITAX (1, 0, 0, 1, 0)

The core observation from Table 17 is that except for the coefficient of international trade, all the variables have the same expected positive signs and are significant in explaining Income Tax in Sierra Leone. Gross Fixed Capital Formation has a minimal effect while the Active Labor Force has the largest effect on Income Taxes.

Table 17 reveals that the tax reform was positive in the short-run as a percentage point change in the dummy variable is associated with a 0.07 percent increase in Income Tax at the 5 percent level of significance. Following this, a percentage point change in the active labor force is associated with a 0.48 percent increase in Income Tax, and, a percentage point change in Gross Fixed Capital Formation is associated with a 0.04 percent increase in Income Tax at the 5 percent level of significance, while a percentage point change in international trade is associated with a 0.79 percent decline in Income Tax at the one percent level of significance.

4.7 Short-run estimates when GST was used as a dependent variable based on the ARDL

Since no long-run cointegrating relationship was established among GST, the Active Labor Force, Gross Fixed Capital Formation, Trade, and the reform dummy, the study proceeds to estimate the short-run estimates and the results are presented in Table 18:

Table 18: Short-run estimates for L GST

Regressor	Coefficient	Standard Error	t-Stat.	Prob(stat.)
LGST L1	0.7732861	0.1760668	4.39	0.000
Lalf	-0.9823172	2.919308	-0.34	0.739
Ldinv	0.1295158	0.3246574	0.4	0.693
Ltrd	-0.2097673	1.382525	-0.15	0.88
dum_2003	3.123798	2.456204	1.27	0.213
Constant	26.82937	39.29805	0.68	0.500
Diagnostic Tests	Statistics			
R-squared	0.7166			
Adj. R-squared	0.6599			
Durbin Watson stat	2.019313			
F-statistic	3.338			
Prob(F-statistic)	12.64			
White's test	34.00 (0.1351)			
Shapiro-Wilk W Test				
Ramsey Test	2.06 (0.1261)			
Dependent Variable: LGST (1, 0, 1, 0, 0)				

The core observation from Table 18 is that except for the Active Labor Force and International Trade, Gross Fixed Capital Formation has the expected positive sign and is significant at the 5 percent level in explaining GST in Sierra Leone.

The findings from Table 18 indicate that the tax reform was positive in the short-run as a percentage point change in the dummy variable is associated with a 3.12 percent increase in the GST at the 5 percent level of significance. Following this, a percentage point change in Gross Fixed Capital Formation is associated with a 0.13 percent increase in GST, but a percentage point change in the Active Labor Force is associated with a 0.98 percent decline in the GST at

the 5 percent level of significance, while a percentage point change in International Trade is associated with a 0.21 percent decline in the GST at the five percent level of significance.

4.8 Short-run estimates when LINTTrTax was used as a dependent variable based on the ARDL

Since no long-run cointegrating relationship was established among INTrTax, the Active Labor Force, Gross Fixed Capital Formation, Trade, and the reform dummy, the study proceeds to estimate the short-run estimates and the results are presented in Table 19:

Table 19: Short-run estimates for L INTrTax

Regressor	Coefficient	Standard Error	t-Stat.	Prob(stat.)
LITrTax L1	0.7727042	0.1816408	4.250	0.000
Lalf	-0.9533188	2.8866	-0.330	0.744
Ldinv L1	0.120507	0.3173612	0.380	0.707
Ltrd	-0.0338415	1.332289	-0.030	0.980
dum_2003	3.06589	2.407491	1.270	0.213
Constant	23.40161	40.21392	0.580	0.565
<i>Diagnostic Tests</i>	<i>Statistics</i>			
<i>R-squared</i>	0.7338			
<i>Adj. R-squared</i>	0.6805			
<i>Durbin Watson stat</i>	2.020716			
<i>F-statistic</i>	3.199			
<i>Prob(F-statistic)</i>	13.78			
<i>White's test</i>	32.09 (0.1902)			
<i>Shapiro-Wilk W Test</i>				
<i>Ramsey Test</i>	2.14 (0.1163)			

Dependent Variable: LINTTrTax (1, 0, 1, 0, 0)

The core observation from Table 19 is that except for the Active Labor Force and International Trade, Gross Fixed Capital Formation has the expected positive sign and is significant at the 5 percent level in explaining GST in Sierra Leone.

The findings from Table 19 indicate that the tax reform was positive in the short-run as a percentage point change in the dummy variable is associated with a 3.06 percent increase in the Trade Taxes at the 5 percent level of significance. Following this, a percentage point change in

Gross Fixed Capital Formation is associated with a 0.12 percent increase in Trade Taxes, but a percentage point change in the Active Labor Force is associated with a 0.95 percent decline in the Trade Taxes at the 5 percent level of significance, while a percentage point change in International Trade is associated with a 0.03 percent decline in the Trade Taxes at the five percent level of significance.

In terms of diagnostics tests, the DW-statistics of these models shows no evidence of serial correlation suggesting that there is no autocorrelation problem in this model. From the outcome of the White test statistics, we are also observed that there is no heteroscedasticity in the model. Using a p-value of 0.05, the RESET statistics show that there are no omitted variables in these models and are sufficient to explain the relationship between respective tax handles and their explanatory variables when tested for functional misspecification. And the CUSUM plot confirms that the model is stable as it lies within the 5 percent boundary.

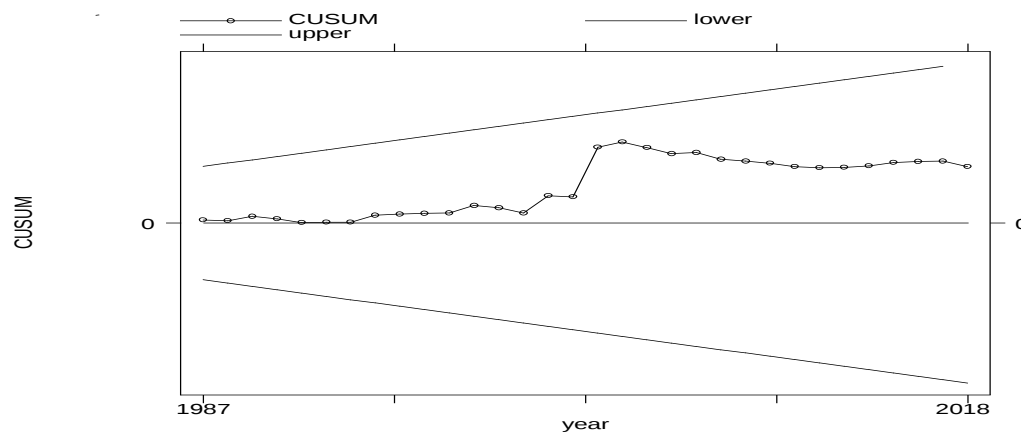


Figure 8: CUSUM statistic plot for tax handles

Table 20: Summary of diagnostic tests conducted

Diagnostic Test	Test	Variable (Log)						Conclusion
		LTREV	LRGDP	LNTR	LITAX	LGST	LINTrTax	
		T-Statistic						
Durbin Watson Test	Serial correlation	1.793228	2.0529	1.568198	1.991867	2.019313	2.020716	No autocorrelation problem
White's Test	Homoscedasticity	0.3753	0.4215	0.4215	0.1193	0.1351	0.1902	No heteroscedasticity
Shapiro-Wilk W Test	Normality	0.455	0.454	0.243	0.246	0.241	0.245	Normally distributed
Ramsey RESET Test	Omission of variables and functional misspecification	0.2461	0.237	0.158	0.642	0.1261	0.1163	Sufficient to explain the relationship between the dependent variable and the explanatory variables

Table 21: Expected signs of the variables

Variable (Log)	Expected Sign	Predicted Sign	
		Short-run	Long-run
LALF	+	-	+
LTRD	+		+
LRGDP	+	-	+
LFDI	+		+
LDINV	+		
LEXR	±		-
LINF	±	+	-
LTREV	+		+
RDummy	+	+	-
LITAX	+	+	
LGST	+	+	
LNTR	+	+	-
LINTrTax	+	+	

4.5 Analyses/Discussions of findings

The focus of this paper is to test whether the tax reforms impacted tax revenue and how these induced- tax revenues have affected the economic growth of Sierra Leone. One interesting finding from this study is that the results show a negative and insignificant relationship between the tax reform dummy and tax revenue, but there exists a positive and significant relationship between tax revenue and real GDP at the 5 percent level of significance.

From Table 14, except for the Reform Dummy, all the other explanatory variables have positive signs with Trade exerting a huge significance in explaining Tax Revenue in Sierra Leone. However, the short-run dynamic coefficient of the Active Labor Force is negative and statistically significant at the 5 percent level. In addition, the estimated coefficient for the ECT reported in Table 9 is negative (-0.6224092) and statistically significant at the 5 percent level with the correct sign by nearly 62 percent of disequilibria from the previous year's shock on tax revenue converge back to the long-run equilibrium in the current year. Apparently, on average, a percentage change in tax revenue is associated with a 0.62 percent decline in tax revenue. In other words, the adjustment process is slow for Sierra Leone. However, the statistical significance of the ECT confirms the presence of a long-run equilibrium relationship between Tax Revenue and tax reforms in Sierra Leone.

From Table 14 also, the coefficient on Trade suggests that long-run changes in Trade have a positive and huge significant effect on Tax Revenue and that a percentage point increase in trade increases tax revenue by 0.75 percent. The result further indicates that the coefficient of long-run changes in the Active Labor Force exerts a positive impact on tax revenue to an extent that a percentage point increase in the Active Labor Force increases Tax Revenue by 0.41 percent, but in the short-run exert a negative impact to the extent that for every one percentage point increase in the Active Labor Force leads to a 0.29 percent decline in tax revenue.

Tax reforms are necessary for developing countries to enhance administrative efficiency and ensuring better taxpayer compliance but the negative sign on the Reform Dummy suggests that the reforms have not created much impact on the revenue mobilization as expected. This result was also evidenced in the report of Kargbo and Egwaikhide (2012) in which they claimed that “the tax reforms have not been part of a concerted effort to reform the entire tax system but part of the efforts to raise more revenue through budget pronouncements affecting the tax rates or tax

brackets.” A typical example to substantiate this assertion is the huge amount of duty exempted by government authorities amidst the reforms. According to the 2019 NRA Annual Report, a total of Le2.6 trillion (representing about 19 percent of total revenues collected and 2 percent of GDP) was waived by the government between the periods 2004 and 2018 just after the reforms. Specifically, in 2011, total exemptions amounted to Le586 billion (representing about 41 percent of total revenue collected and 5 percent of GDP) in the same year (see Table 1). This situation revealed that despite the tax reforms, revenue collection is still compromised by state authorities posing a risk to the very essence of the tax reforms-revenue mobilization. Kahn, et al (2000) suggested that tax reforms must be meticulously developed with a comprehensive strategy before undertaking them. They furthered that tax authorities must think through the pace and sequences of the tax reforms and should be implemented sequentially, and, all levels of government must show a strong political will to modify the tax administration, or else the expected result of the reforms will not produce a dividend.

According to Talierico (2003), even if the tax structure has been simplified and a comprehensive strategy being designed but if the political will is not available then the chance of a successful tax reform drops dramatically. Talierico (2003) continued that state authorities must provide a credible commitment to taxpayers that the reformed tax administration will be more professional and fair in its dealing with taxpayers. If the policy is not seen as credible by taxpayers, then the rationale of the reformed policy cannot be fully realized. This suggests that reforming the tax system should give the tax authority autonomy in assessing and collecting taxes rather than been influenced by state functionaries.

The negative impact of the Active Labor Force on tax revenue in the short-run could be attributed to the level of the labor force participation rate in the country at the material time. It is evident in many growth theories that an increase in the labor force participation rate in economic activities will boost revenue mobilization as all employers will pay direct income taxes to the government for their employees, besides, these employed labor do also pay indirect taxes like VAT/GST.

Consistent with the data from the ILO estimates on the employment rate in Sierra Leone, from 1991 to 2002, total employment was at 62 percent to the total population, in which Agricultural sector employment accounts for almost 71 percent, Industrial employment accounts for about 6.1

percent, the Services sector employed approximately 23.1 percent with Wages and Salaried workers accounts for about 9.3 percent to total employment. However, total employment from 2003 to 2018 reduced to 60 percent, Agricultural sector employment and Industrial employment decline to 63 percent and 6 percent respectively while employment in the services sector, and Wages and Salaried workers increased to 32 percent, and 10.4 percent respectively.

From this analysis, it is safe to provide an explanation why in the short-run the estimated coefficient on the Active Labor Force was negative to Tax Revenue because it is evident from the ILO estimates that the proportion of the employment in the Agricultural sector declined in the long run, while employment in the services sector increased coupled with an increase in the proportion of Wages and Salaried workers in the long run (see appendix).

However, what is clear in all of this inconsistency is that citizens cannot spend or invest what they cannot dispose of or save and, for individuals to consume or invest which will boost revenue mobilization there must be an increased labor force participation rate in the economy. This assertion is supported by the Ability-to-Pay Theory of taxation which posits that the total tax burden should be distributed among individuals according to their capacity to bear it, taking into account all of the relevant economic characteristics with higher incomes earners expected to pay more taxes as opposed to people with lower incomes

The positive and significant impact of Trade on Tax Revenue could be as a consequence that Sierra Leone's trade liberalization scheme is operationalized by the implementation of the ASYCUDA ++ in 2010 to facilitate trade and investment, thus, leading to a high magnitude of import and trade tax revenue. According to Prithett and Sethi (1994), the higher tariff incentives the more importers apply for exemptions thereby affecting the productivity of the tax system but the lower the tariff in some areas become a reason to increase in the tax base by reducing the marginal benefit to avoid taxation, hence liberalization leads to a rise in revenue.

An IMF Working Paper (2006) on *"Fiscal Implications of Multilateral Tariff Cuts"* through trade reforms in multilateral trade negotiations for a group of 58 low- and middle-income countries indicates that while only a small number of countries experienced a significant effect by the tariff cuts but it was also observed that there is the need for those countries who are adversely affected to adopt complementary fiscal policies to compensate for the revenue loss. To support this assertion, in studying the implications of trade liberalization on international trade

taxes of the South African economy, A. Matlanyane and Harmse (2002), estimation results show that customs revenue is highly productive and, that trade liberalization has a significant effect on customs revenue, thus, an upsurge in imports may lead to a reduction in trade tax revenue. However, their findings suggest that exchange rate liberalization policy should be adopted as a supportive macroeconomic monetary instrument to complement the trade liberalization scheme effect in revenue collection in South Africa. Tanzi (1989) also observed that overvaluation has a direct effect by thwarting import and export bases measured in local currency which has the potential to mitigate revenues collected in international trade taxes, sales, and excise taxes, but he concluded that the tax collection strategy is different in different countries and, it is, therefore, one must not hastily generalize about the effect of changes in trade liberalization without examining the structure of the different components of revenues. So this contradicts the case that it is not always true that a reduction of tariff due to trade liberalization leads to the reduction in revenue as evidenced in this study.

The insignificant influence of Gross Fixed Capital Formation on Tax Revenue could be attributed to the increase in the company tax rate which has a crowding-out effect on investors, hence, depriving them of the required capital that will stimulate domestic private investment. This finding is consistent with the work carried out by Talpos and Vancu (2009), and Raza et al. (2011) in examining the effects of Company tax on investment decisions for 27 EU member states for eight years, and the impacts of corporate income tax and firm size on investment in Pakistan for six years for selected manufacturing companies respectively.

The findings of Talpos and Vancu (2009) reveal that corporate income taxation harms some developing former transition countries. They furthered that for average and above-average EU member countries, the result showed a direct relationship between Gross Fixed Capital Formations and corporate income tax but taxation being a less significant determinant of investment. Raza et al.'s (2011) result also show that there is a negative relationship between Corporate Income Tax and Investment in Pakistan, while the firm size and investment reveal a positive relationship with each other. To this end, it is suggestive that an appropriate tax system and effective progressive tax reforms are necessary to ensure that private investors are given the enabling environment to thrive.

The estimated coefficient for the ECT reported in Table 10 is negative (-0.8274654) and statistically significant at the 5 percent level with the correct sign by nearly 82 percent of disequilibria from the previous year's shock on economic growth converge back to the long-run equilibrium in the current year. Apparently, on average, a percentage change in real GDP is associated with a 0.82 percent decline in economic growth. In other words, the adjustment process is slow for Sierra Leone. However, the statistical significance of the ECT confirms the presence of a long-run equilibrium relationship between the reformed induced- Tax Revenue and economic growth in Sierra Leone.

From Table 14, it is evident that the results of the short-run dynamic coefficients of both Tax Revenue and Foreign Direct Investment have the expected signs and are significant at the 5% level in the long run. This suggesting that changes in Tax Revenue have a positive and statistically significant effect on real GDP at the 5% level to the extent that a one percent increase in Tax Revenue increases economic growth by approximately 0.3 percent in the long run. Also, the coefficient of the long-run changes in Foreign Direct Investment exerts a positive but insignificant impact on real GDP in the long run as a one percent increase in Foreign Direct Investment only increases economic growth by 0.01 percent.

There are contending views about the effect of taxation on FDIs, Barlow, and Wender (1955) for example, found out that taxation is not a significant determinant of investment decisions but Hines (1996) held a contrary view that taxation could significantly affect the actions of transnational corporations and thereby causing increased FDI inflows. To support the view, Kransdorff (2010) claims that tax policies do play a role in attracting FDI in certain circumstances in developing countries. In another study to determine the tax policy's responsiveness to FDI inflows in developing countries, Dethier and Madiès (2010) reveal that developing countries' FDI inflows tend to be responsive to tax policies though with varying degrees. They furthered that tax holidays are critical incentives in inducing FDI in developing countries. Using UNCTAD's FDI Potential Index, Kransdorff (2010) performed a study to compare South Africa's tax policies with Brazil. His findings reveal that South Africa does not offer a large variety of tax inducements which has the potential to discourage foreign investors and thereby perform on a sufficient scale in the world market.

The results of this study could have been a consequence of increased tax rates during the tax reform agenda which necessitated an increase in revenue mobilization but discourage foreign direct investment as rational investors might not want to invest in a country with an unfavorable tax regime. A study to assess the impact of changes in tax rates on FDI inflows in both Australia and the USA, Wijeweera, and Mounter (2007) found out that a reduction in tax rates leads to an increased level of FDI in Australia and a one percent increase in corporate tax rates leads to a one percent decline in FDI inflow for the United States. Hines (2010) established that on average, FDI increased by two percent for every one percent reduction in the corporate tax rate in the USA.

As Hines (1997), put it, discussions about company tax reform and tax harmonization rely largely on the opinion that tax rates have significant implications for the behavior of multinational firms. To support this view, Dunning (1981), claimed that the objective of MNCs is to maximize the value of the firm and that FDI could be attracted if the Ownership, Location, and Internalization conditions (otherwise known as the OLI conditions) are met because tax rates can affect all three OLI conditions. The tax rate can influence the tax treatment of a foreign firm, relative to locally-owned firms. The tax rate can also be a factor that determines the attractiveness of a location for undertaking investments amidst other factors such as good infrastructure, the availability of workers with good knowledge, proximity to markets, or the proximity of other businesses due to network and agglomeration benefits.

It is a truism that the higher tax rate in developing countries would have serious economic ramifications especially because rational investors usually consider corporate tax rates when planning where to establish an investment with a more comprehensive assessment of what is factored in the term “corporate tax rate” as espoused by Bolnick (2004) in which he claims that “the main negative impact related to decreasing the corporate tax rate to attract new investments, is that the benefit of reduced tax rates is enjoyed by all parties even in the absence of additional investment”. Halimi (2009, p.237) also claims that a corporate tax system with efficient and effective fees, optimal deductibility rules, and discounts for depreciation is not only an incentive for foreign investors but also stimulates economic growth. To this end, consistent with the findings of this study, the minimal effect of FDI on the economic growth of Sierra Leone could be attributed to higher tax rates coupled with other fundamental factors which have the potential

to mitigate FDI inflows in Sierra Leone because it makes the country less attractive as a location for investment. This therefore may lead to a decrease in tax revenues should it not be combined with the implementation of other measures to increase the tax base that generates revenues.

From Table 15, it was observed that in the short run, the coefficient of real GDP is negative to an extent that a one percentage point change in real GDP is associated with a 0.16 percent decline in real GDP. Thus, suggesting the previous year's growth harms the current year's GDP. The ECT coefficient indicates that about 17 percent of the previous year's shock is unaccounted for in the long-run equilibrium of the current year.

This result on the real GDP being negative in the short-run is consistent with the works of Greenidge and Drakes (2009) when they used an unrestricted ECM to examine tax policy and its effect on macroeconomic activity in Barbados. According to their findings, total and indirect taxation has a shrinking effect on the economy in the short-run with no long-run effect, while direct taxation reduced growth in both the short-run and long-run. Using a general ARDL model and quarterly data from 1990 to 2010, a similar study was done by Scarlett in 2011 to examine the impact of taxation on economic growth in Jamaica. His findings indicate that enhancing revenue from indirect taxes is more favorable to economic growth in the long run but increasing the share of taxes from personal income has the greatest harm on per capita GDP over time.

Another study conducted by Padda and Akram, (2009) on the impact of tax reforms on the economic growth of three Asian countries also supports the findings of this study. Consistent with the findings of Musaga (2007), Padda and Akram, (2009) analyze the empirical effects of taxes on economic growth in Pakistan, India, and Sri Lanka by examining whether the tax policies implemented by these countries have a transitory or permanent effect on their economic growth covering a period of thirty-five years from 1973 to 2008. They found out that the impact of tax rate reforms is transitory and negative in the short-run for Pakistan and India but Sri Lanka is positive for the first year and thereafter also harms economic growth. Besides, Ogbonna, and Ebimobowei (2012), also came out with similar findings in assessing the impact of tax reforms in Nigeria, in which they claimed that tax reforms can improve revenue mobilization to support government expenditure that will translate to economic growth but economic growth cannot be actualized if the tax reform processes do not review the tax laws and rate comprehensively in a

modern trend, corrupt-free, efficient, and effective tax administration backed by transparent and accountable staff.

The findings of Padda and Akram (2009), and Ogbonna and Ebimobowei (2012) further buttress the findings of this study that in the short run, real GDP was negative. This suggests that tax rates are critical in the growth trajectory of the economy, hence, in reforming the tax system, fiscal authorities must design cost-effective tax rates that will not compromise the desired expectation of the reform agenda as espoused by Wagacha's argument in 1999. Wagacha (1999) argues that "tax administrative reform should seek to enhance the efficiency and productivity of taxation; improve tax collection and administration while lowering the rates, and gain tax effectiveness through greater tax elasticity".

Of course, the goal of any tax reform is to enhance administrative efficiency and improve revenue mobilization but tax authorities should also be mindful that with higher tax rates there is the tendency to induce tax evasion which will lead to compromising the very essence of the reforms and adversely affect the economy. Bekoe's (2012) scholastic study on tax evasion and economic growth in selected African countries finds out that tax evasion stifles economic growth such that every 10 percent increase in tax evasion reduces economic growth by about 7.1 percent. This suggests that optimal tax rates tend to increase tax revenues more than marginal tax rates without compromising the benefits of the tax reforms as evident in the findings of Padovano and Galli (2001).

As expected, Table 20 further reveals that in the long run, the coefficients of both the Exchange Rate and Inflation have negative signs with inflation having a significant effect on real GDP at the 5% level. However, the coefficient of inflation in the short run is positive and significant. It thus follows that in the short-run, a one percent increase in inflation increases real GDP by 0.47 percent. Following this, in the long run, a one percent increase in Exchange Rate decreases real GDP by 0.031 percent, and, a one percent increase in Inflation is associated with a 0.25% decline in real GDP.

The positive sign on the coefficient of Inflation Rate in the short-run contradicts the traditional growth theories of Inflation, and, reflects the fact that below a given level of the inflationary rate, inflation is necessary for the economy to grow as explained in the Quantity Theory of Money. According to Milton Friedman (1968), the effective use of monetary policy may increase

employment but cause inflation, but an increase in nominal wage translates into an expected rate of inflation, causing a reduction in the real wages, thus enabling firms to increase labor demand, hence, the need for stable money supply with a minimal government role to correct the market imbalance.

The negative sign of the Exchange Rate, in the long run, is consistent with the theory of macroeconomic stability and growth nexus as depreciation in the local currency will put pressure on the inflationary rate causing the nominal GDP to be deflated when consumer prices increase, thereby strengthening the argument of no positive relationship.

Though the reforms created some positive effects on the NTR in the short run this effect failed to persist into the future. The reason could have been as a result of the legislation creating the NTRD which denied the NRA from “assessing” royalties, and other fees from taxpayers as contained in the (NRA Act 2002). According to the NRA Act 2002, the Authority is mandated to only collect taxes and not assess tax from this tax handles. In addition, royalty payments dropped drastically in 2014 and 2015 during the twin shocks of the Ebola and the fall in commodity prices of the Iron Ore which saw the Non-Tax Revenues reduced by 19 percent from Le352Bn in 2014 to Le286Bn in 2015.

The positive effect of the reform on the Income Taxes as depicted from Table 11 cannot be overemphasized as the reforms brought some automated systems such as the DTIS, which profiled all domestic taxpayers from registration to filing of returns thereby increasing compliance. Despite this, the reforms also brought in a fluctuated review in the income tax rates to increase domestic tax. For almost two decades there have been series of tax rates fluctuations amidst the reforms. The PAYE tax bracket was 25-40% between the periods 2000 to 2010, though it was reviewed downwards to 15%-30% between 2011 and 2015, it was also reviewed upwards to 35% between 2016 and 2018. Despite this, Withholding Tax for both local and foreign contractors was increased from 5% in 2000 to 5.5%, and 10% to 10.5% in 2016 respectively. Though Corporate Income Tax was reduced by 55 to 30% in the last sixteen years, the reforms also introduce new taxes such as the Capital Gains Tax and the Turnover Rate tax in 2013. Kargbo B.I.B and Egwaikhide F.O (2012) claims that the “tax reforms have not been part of a concerted effort to reform the entire tax system but part of the efforts to raise more revenue through budget pronouncements affecting the tax rates or tax brackets”.

Though Mureşan et al., (2014) claim that a high VAT rate may constraint the possibility of consumption and investment, generates negative effects on the supply and the demand of commodities, but the implementation of the GST in 2010 has helped to simplify and streamline the collection of indirect taxes and also reduce the cost of tax administration for both the NRA and GST taxpayers as seen in Table 12. The GST replaced seven existing taxes (import sales tax, domestic sales tax, entertainment tax, restaurant tax, food tax, message tax, hotel accommodation tax, and professional services tax). Before the implementation of the GST, the collection of these seven taxes was very complex and difficult as the collection method was largely manual which most often than not resulted in tax avoidance and evasion. However, the theoretical tax burden literature argues that if a tax affects the price of an accumulated factor of production then this tax is distortionary.

The positive effect of the reform on the Trade taxes reflects the expectations of the reforms implemented at the Customs and Services Department of the NRA. Before 2010, the collection of customs duties and other related charges were manually done and there were serious bottlenecks in the trade facilitation scheme as it takes nearly a week or more to clear goods at the ports. However, the implementation of the ASYCUDA++ in 2010 brought in an online declaration of goods with a reduction of the number of days in clearing goods to twenty-four hours per declaration, thus, increasing revenues from trade taxes, and also facilitate the easy movement of goods in and outside the country.

To this end, while changes in tax legislation served as the fundamental institution in contributing to enhanced revenue performance, tax administrative reforms are intended in particular to restore buoyance to revenues, strengthen modern taxes, and drastically mitigate the complexity and lack of transparency of the system, making the tax system neutral and compatible with the market economy, promote international trade and regional trade integration, and financial liberalization to increase the revenue share in GDP. However, this goal can be compromised if tax authorities intend only to increase tax revenue to address budget imbalances rather than taking a comprehensive reform in the entire tax administrative system.

CHAPTER FIVE

5 Summary, Conclusion, and Recommendation

5.1 Summary

Having carried out the analysis of the data collected and discussing the results, there was the need to draw a conclusion on this paper and also make recommendations. In this chapter, therefore, the summary, conclusion, and possible recommendations for better fiscal policy formulation are presented.

The study investigated the effects of tax reforms on tax revenue, and, the effect of the reformed-induce tax revenue on the economic growth of Sierra Leone over the period, 1981 to 2018. But more importantly, the goal of this study is to examine the effects of the reformed-induce tax revenue on the economic growth of Sierra Leone in the period under review.

The study was done by specifying three models. The first model explains tax revenue as a function of some theoretical variables given the structure of the economy. The second is a model of real GDP, specified based on the structure of the model to establish the effect of induced-tax revenue on growth. The third model explains the effects of the reform on the different tax handles in the overall tax revenue productivity using the ARDL/ECM approach.

The study was able to reveal that the post estimation signs for Tax Revenue, Trade, Foreign Direct Investment, Gross Fixed Capital Formation, Income Tax, the Goods and Services Tax and International Trade Tax conform to their apriori expectations, while Active Labor Force, Real GDP, Inflation, and Non-Tax Revenue prove otherwise. In the short-run, both Active Labor Force and Real GDP were negative, while Inflation is positive indicating a contravention to their expected signs. However, in the long run, the Active Labor Force and Real GDP were all positive while Inflation is negative, thus conforming to their expected signs. Non-Tax Revenue was also negative in the long run indicating a contravention to its expected signs. Following this, series of a diagnostic tests were carried out, including normality of residuals, serial correlation of residuals, heteroscedasticity, functional misspecification, and stability of the models.

5.2 Conclusion

Though economic growth is a wide concept, so many issues had to be established to come up with the most viable conclusion but it is worthy to note that, the study has empirically examined the relationship among Tax Revenue, Active Labor Force, Gross Fixed Capital Formation, Trade, and, the relationship between Real GDP, Tax Revenue, Exchange Rate, Inflation, and Foreign Direct Investment, Income Tax, Goods and Services Tax, Non-Tax Revenue, and International Trade Taxes in Sierra Leonean data set for the period 1981 to 2018.

The study found out that the tax reform created a positive effect on the three tax handles (ITAX, GST, and INTrTax) for a short period but a negative effect on the NTR in the long run. Despite the fact tax revenue fosters economic growth, it was generally observed in the long run that the reform does not create the much-expected effect on the overall tax revenue productivity. Thus, not all tax reforms could be productive. The empirical evidence revealed the following findings:

First, in the long run, the Active Labor Force, Gross Fixed Capital Formation, and Trade exerted a positive and significant effect on Tax Revenue, thus, conforming to apriori expectations. The Reform Dummy exerts a negative but insignificant impact on Tax Revenue. Trade exerts the highest impact on Tax Revenue followed by the Active Labor Force with Gross Fixed Capital Formation having a minimal impact on Tax Revenue. In the short-run, however, the Active Labor Force exerts a negative and significant influence on Tax Revenue.

Second, the results found a statistically significant and positive relationship between Real GDP and Tax Revenue. In the long run, Tax Revenue and Foreign Direct Investment exerted positive effects on Real GDP with Tax Revenue having a significant impact in explaining Real GDP in Sierra Leone, thus, indicating that tax revenue is critical to the economic growth of Sierra Leone. As expected, in the long run, both Exchange Rate and Inflation have a negative (depreciating) effect on growth. In the short-run, the coefficient of real GDP is negative indicating that about 17 percent of the previous year's shock on growth was unaccounted for in the long-run equilibrium of the current year as evident in the coefficient of the ECT for real GDP. In the short run, it was also observed that the estimated coefficient on Inflation was positive and contradicting the traditional growth theories of inflation, and, reflects the fact that below a given level of the inflationary rate, inflation is necessary for the economy to grow.

Thirdly, the results found a positive effect of the reforms on Income Taxes, Goods and Services Tax, and International Trade Taxes but a negative effect on the Non-Tax Revenue.

Conclusively, what has become of concern of this study is the relationship between Tax Revenue and Economic Growth, the direction of the relationship if any exist, and what type of tax reforms must be implemented to raise more revenue and enhance the economic growth of Sierra Leone.

5.3 Recommendation

The undermentioned recommendations are in no way to validate previously recommended suggestions, however, from the findings of this study, the following policy recommendations are suggested when reforming the tax system to increase tax revenue mobilization that will ultimately have a positive effect on the economic growth of Sierra Leone:

1. Tax reforms must be carefully developed with a comprehensive strategy before undertaking them; and, tax authorities must think through the pace and sequences of the tax reforms, with all levels of government exhibit a strong political will to modernize the tax administration;
2. In ensuring that private investments are allowed to thrive, fiscal policy should aim at channeling resources towards the private sector, production, while providing tax incentives to attract foreign direct investment;
3. To increase the tax base and escape from a single source of domestic revenue, the government should adopt policies that would diversify the economy to create more employment that will enhance domestic production, stimulate exports that will mitigate the negative relationship effects of exchange rate on the economy;
4. Since it might be possible for foreign direct investment to be contributing to growth without necessarily improving the welfare of citizens, the government should be cautious, and such investment should be directed to specific sectors of the economy where they are needed most; and
5. To increase more taxes from the NTRD, the government should review the 2002 NRA Act to give NRA the mandate of assessing and collecting taxes from royalties payments, licenses, fees, and other charges being currently assessed by the respective MDAs in the country.

5.4 Limitations of the study

Taxation and economic growth are a wide concept, so many issues had to be established to come up with the most viable conclusion. Data unavailability was the prime constraint in this study and is common in Sub-Saharan African countries. The sample space was not wide enough to cover more periods especially periods before the hosting of the OAU (in the 1970s) in Sierra Leone. Besides, other relevant variables such as domestic private investment, urbanization rate, compliance statistics, etc. should have been included in the models to know their full impacts on the relationship between real GDP and tax revenue but there was not enough data on these variables to cover the study period.

Moreover, the bounds tests approach adopted in this study also showcased some flaws. Pesaran et al (as cited in Erbaykal & Okuyan, 2010) argued that the existence of a cointegrating relationship can be examined between the series regardless of whether they are I (0) or I (1) on the proviso that the dependent variable is I (1) and the independent variables are either I (0) or I (1). This means the bounds tests approach may not produce a robust result in situations where the dependent variable is I (0). This was evident in the current study. The bounds test procedure in this study failed to produce a long-run cointegrating relationship among some independent variables as against their dependent variables.

5.5 Future direction of research

Due to time, financial, and data constraints, not all essential issues were analyzed in this study, hence, the study failed to unravel the comprehensive nature of the relationship that should exist among the variables especially the tax reform policies that will induce tax revenue to leverage macroeconomic performance and economic growth.

Hence, the future direction of research on this topic should consider the possibility of exploring the nature of the relationship amongst these variables that will foster revenue performance on one hand and economic growth on another. Also, to explore the impact of non-economic variables that have served as key performance indicators in revenue administration, and, other estimation techniques should be explored.

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Appendix

Appendix 1: Tax-to-GDP ratio for thirty-three selected Sub-Sahara African Countries

Tax-to-GDP Ratios for Thirty-Three Selected Countries in Sub-Sahara Africa (1990-2018)										
Country	Year									
	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008
Benin	-	-	-	-	-	-	-	-	-	-
Bostwana	-	-	-	-	-	15.5	15.2	15.2	13.7	17.1
Burkina Faso	-	8.6	8.7	9.2	9.8	10.7	10.2	10.7	11.2	10.5
Cabo Verde	10.5	14.8	16.5	18.9	17.2	18.2	18.9	20.4	20.7	21.2
Cameroon	-	10.4	11.6	10.8	11.3	10.3	11.1	11.6	12.0	11.7
Chad	-	-	-	-	-	-	-	-	-	-
Congo	-	4.3	6.0	7.2	8.7	8.2	6.4	5.8	7.0	6.9
Congo, Dem. Rep.	-	0.6	2.3	3.0	3.4	4.7	5.2	5.8	6.9	8.5
Côte d'Ivoire	14.6	10.1	10.3	10.5	9.7	10.5	10.4	10.8	11.4	11.3
Equatorial Guinea	-	-	-	-	-	-	8.2	9.7	7.5	7.8
Eswatini	-	9.5	9.3	9.6	10.6	10.1	10.2	10.2	10.2	11.4
Gambia	18.2	-	4.2	4.9	5.6	4.7	4.4	5.0	8.1	9.1
Ghana	-	7.1	7.5	7.6	8.8	9.8	10.3	9.3	9.7	9.6
Guinea	12.1	-	-	-	-	-	-	-	-	-
Guinea Bissau	-	-	-	-	-	-	-	-	-	-
Kenya	-	-	16.4	15.9	16.5	16.9	18.1	17.2	17.9	18.7
Lesotho	-	-	-	-	-	17.4	15.9	15.0	15.7	16.9
Liberia	-	-	-	-	-	-	7.6	7.2	10.2	9.8
Madagascar	-	9.6	8.3	6.5	8.8	9.6	8.9	9.4	10.0	11.4
Malawi	-	-	-	-	-	-	12.6	12.6	13.6	14.6
Mali	-	10.5	10.5	11.3	12.8	13.6	13.1	12.7	12.8	11.9
Mauritania	-	-	-	-	-	-	-	-	9.4	9.5
Mauritius	21.4	17.5	15.5	15.2	16.6	16.7	17.2	17.2	16.4	18.1
Namibia	-	-	-	-	-	-	-	16.2	17.2	17.7
Niger	-	6.9	7.4	7.8	7.8	8.4	7.9	8.3	8.7	8.6
Nigeria	-	-	-	-	-	-	-	-	-	-
Rwanda	-	9.7	10.7	11.9	11.6	11.2	11.3	11.1	11.3	12.2
Senegal	-	12.7	12.7	13.4	13.4	13.7	14.6	14.9	15.2	14.3
Seychelles	-	-	-	-	-	-	-	-	-	22.6
Sierra Leone	5.6	11.4	9.6	9.1	8.8	9.1	8.6	8.9	8.3	8.9
South Africa	23.9	22.4	23.7	22.9	22.3	23.3	25.2	26.4	27.7	27.4
Togo	-	9.4	10.9	9.6	11.9	13.2	13.3	14.5	15.2	14.4
Uganda	-	9.4	9.3	9.6	10.0	10.2	10.5	10.7	10.8	10.6

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Benin	0	0	0	0	0	0	0	0	0	0
Botswana	15.8	15.6	15.7	13.8	14.7	15.2	12.7	14.0	12.3	12.1
Burkina Faso	11.2	12.6	12.4	14.0	14.9	13.8	13.6	14.3	15.2	15.2
Cabo Verde	18.4	18.4	19.5	17.7	17.7	16.9	18.7	18.7	20.1	21.2
Cameroon	12.2	11.1	12.0	12.5	13.1	13.5	13.8	13.1	13.4	13.6
Chad	-	14.7	17.9	14.6	15.3	11.0	5.7	4.1	5.9	7.1
Congo	8.3	7.5	7.9	8.9	11.1	12.3	17.8	17.3	13.6	8.5
Congo, Dem. Rep.	7.9	8.3	8.8	10.2	9.5	8.9	9.2	8.0	6.4	7.1
Côte d'Ivoire	11.2	11.0	10.3	11.6	11.3	10.8	11.2	11.6	11.8	11.6
Equatorial Guinea	12.8	7.6	7.0	8.8	8.4	9.2	11.3	6.3	5.9	5.7
Eswatini	11.1	12.0	12.2	11.3	12.2	13.1	13.0	14.0	14.6	14.8
Gambia	9.4	-	-	-	-	-	-	-	-	-
Ghana	9.2	9.9	10.8	11.1	10.4	11.0	11.9	12.5	12.8	13.3
Guinea	-	-	-	-	-	-	-	-	-	-
Guinea Bissau	-	-	-	-	-	-	-	-	-	10.3
Kenya	18.0	17.7	18.4	17.7	17.8	19.0	18.3	18.0	18.0	16.8
Lesotho	17.8	18.4	18.9	18.1	17.5	18.1	18.9	18.7	18.4	20.2
Liberia	-	11.2	11.1	13.3	12.9	-	-	-	-	-
Madagascar	9.5	9.5	9.6	8.9	8.9	8.6	9.1	9.7	10.5	10.8
Malawi	15.3	15.9	16.3	14.5	16.2	17.9	16.8	16.9	18.7	18.3
Mali	12.9	12.8	12.3	12.5	12.8	12.4	13.7	14.6	15.0	12.4
Mauritania	9.8	9.1	10.0	12.8	12.7	14.2	13.6	13.4	13.8	15.2
Mauritius	18.6	18.3	18.3	18.8	18.5	18.6	18.5	18.7	19.0	19.6
Namibia	17.6	18.3	21.1	19.6	19.8	20.9	21.2	20.9	20.3	19.4
Niger	9.9	9.2	9.7	10.2	12.2	11.8	12.0	10.0	8.9	10.6
Nigeria	-	6.7	9.0	8.7	7.6	6.9	5.5	4.7	5.1	5.8
Rwanda	11.8	12.1	12.6	13.2	14.3	14.8	15.7	15.6	15.4	16.1
Senegal	14.1	14.9	15.3	14.9	14.3	15.2	15.3	15.9	15.1	15.3
Seychelles	23.9	27.5	32.0	30.6	28.5	29.5	28.7	31.0	31.1	31.4
Sierra Leone	9.0	9.8	11.4	11.3	10.7	9.8	10.0	13.0	11.0	13.0
South Africa	25.4	25.3	26.0	26.3	26.7	27.2	28.5	28.1	28.0	28.7
Togo	14.6	14.8	16.2	16.8	19.5	20.9	21.6	22.1	21.0	19.4
Uganda	9.7	9.1	9.3	9.5	9.9	10.0	10.9	11.2	11.4	11.8

Source: Revenue Statistics in Africa 1990-2018, OECD/ATAF/AUC, 2020

Appendix 2: Tax Revenue versus Revised Revenue Targets: 2003-2018

Year	Annual Target (In Million Leones)	Actual Revenue (In Million Leones)	Difference (In Million Leones)
2003	258,209	277,811	19,602
2004	314,896	319,231	4,335
2005	405, 223	392,903	(12,320)
2006	510,352	463,920	(46,432)
2007	514, 042	501,922	(12,120)
2008	638,868	615,645	(23,223)
2009	668.343	700,327	31,984
2010	930,495	955,662	25, 167
2011	1,321,371	1,428,781	107,410
2012	1,853,761	1,874,810	21,049
2013	2, 103,356	2,127,397	24,041
2014	2,132,483	2,174,379	41,896
2015	2,077,000	2,235,373	158,373
2016	2,647,906	2,799,704	151,798
2017	3,754,058	3,204,610	(549,448)
2018	4,326,732	4,205,243	(121,488)

Source: Own computation from Sierra Leone's National Revenue Authority, 2020

Appendix 3: Duty-free concessions/tax exemptions: 2004-2018

Value of Duty/Tax Exemptions 2004 – 2018							
(Amount in Million Leones)							
Period	Duty-free Concession	Others	Total Exemptions	Total Revenue	GDP	Total Exemptions as % of Total Revenue	Total Exemption as % of GDP
2004	53,734	5,816	59,550	319,231	3,912,928	19%	2%
2005	46,728	8,498	55,226	392,903	4,769,249	14%	1%
2006	37,806	8,340	46,146	463,920	5,583,531	10%	1%
2007	25,058	14,925	39,983	501,922	6,443,515	8%	1%
2008	38,868	19,535	58,403	615,645	7,470,063	9%	1%
2009	35,714	24,265	59,979	700,328	8,308,046	9%	1%
2010	163,532	105,047	268,578	955,663	10,255,613	28%	3%
2011	430,989	154,998	585,987	1,428,781	12,797,613	41%	5%
2012	365,268	223,811	589,079	1,874,810	16,515,432	31%	4%
2013	258,663	194,774	453,437	2,212,546	21,317,392	20%	2%
2014	198,984	173,304	372,288	2,174,379	22,689,371	17%	2%
2015	136,363	239,542	375,905	2,235,373	21,434,273	17%	2%
2016	198,506	137,794	336,301	2,799,704	22,368,526	12%	2%
2017	227,038	176,085	403,123	3,204,610	27,876,580	13%	1%
2018	395,376	100,613	495,989	4,272,070	32,400,717	12%	2%
Total	2,612,627	1,587,346	4,199,973	24,151,885	224,142,847	19%	2%

Source: Sierra Leone's National Revenue Authority, 2020 (Own Computation)

Appendix 4: Some macroeconomic indicators for Sierra Leone: 1981-2018

Year	Real GDP (In Million USD)	Tax Revenue (In Million USD)	Active Labor Force (In Thousands)	Gross Capital Formation (In Million USD)	Foreign Direct Investment (In Million USD)	Trade (In Million USD)	Nominal Exchange Rate (In Leones)	Inflate Rate (Annual % change in CPI)
1981	2,489,220,710	180,000,000	634,157	105,665,512	75,058	7,000,000	1	23
1982	1,489,112,595	150,000,000	634,610	108,529,855	46,825	5,400,000	1	27
1983	2,534,001,670	83,000,000	638,223	94,968,266	16,973	3,300,000	2	69
1984	1,057,308,409	82,000,000	646,209	74,575,993	58,567	2,500,000	3	67
1985	985,552,736	53,000,000	656,347	63,364,682	(309,570)	2,700,000	5	77
1986	517,698,170	25,000,000	669,920	66,650,915	(1,400,000)	1,300,000	16	81
1987	1,549,118,276	42,000,000	680,005	62,785,857	394,095	3,900,000	34	179
1988	202,514,714	72,000,000	677,036	65,116,451	(230,885)	4,500,000	33	34
1989	1,653,785,546	62,000,000	656,356	101,524,067	223,564	3,900,000	60	61
1990	1,184,960,712	53,000,000	1,600,000	180,113,400	324,347	4,500,000	151	111
1991	722,309,250	63,000,000	1,600,000	168,866,869	75,045	4,700,000	295	103
1992	433,689,083	71,000,000	1,600,000	107,243,200	(55,991)	4,400,000	499	66
1993	260,574,562	96,000,000	1,600,000	108,439,640	(74,629)	4,100,000	567	22
1994	994,070,563	110,000,000	1,500,000	126,597,368	(28,742)	5,000,000	587	24
1995	935,525,918	83,000,000	1,500,000	73,405,078	72,871	3,900,000	755	26
1996	836,701,682	95,000,000	1,500,000	184,223,521	6,639	4,700,000	921	23
1997	537,367,242	46,000,000	1,600,000	(37,371,138)	18,000	2,400,000	981	15
1998	1,657,913,246	49,000,000	1,600,000	72,560,533	1,049	2,400,000	1,564	36
1999	634,056,128	48,000,000	1,600,000	3,758,227	5,332	2,300,000	1,804	34
2000	(16,782,598)	73,000,000	1,600,000	92,365,124	390,008	3,700,000	2,092	(1)
2001	(3,150,240,058)	100,000,000	1,700,000	124,725,292	98,357	3,900,000	1,986	3
2002	48,205,405	110,000,000	1,800,000	158,145,642	104,134	4,800,000	2,099	0
2003	55,432,402,888	120,000,000	1,900,000	178,946,003	86,151	6,400,000	2,348	4
2004	4,671,530,635	130,000,000	2,000,000	180,225,658	611,533	6,600,000	2,701	13
2005	1,752,850,607	140,000,000	2,000,000	221,617,825	907,317	7,700,000	2,890	14
2006	1,444,794,023	170,000,000	2,100,000	213,153,862	588,691	7,900,000	2,962	11
2007	3,494,709,223	180,000,000	2,100,000	213,941,370	954,702	8,700,000	2,985	17
2008	1,208,515,375	220,000,000	2,200,000	216,788,683	530,951	9,800,000	2,982	8
2009	2,244,420,592	220,000,000	2,200,000	233,017,367	1,100,000	10,000,000	3,386	8
2010	2,474,905,245	260,000,000	2,200,000	791,862,924	2,400,000	13,000,000	3,978	7
2011	2,779,071,960	340,000,000	2,200,000	1,125,720,231	9,500,000	24,000,000	4,349	7
2012	3,690,043,123	430,000,000	2,300,000	833,410,593	7,200,000	35,000,000	4,344	7
2013	4,100,285,996	530,000,000	2,300,000	702,075,059	4,300,000	43,000,000	4,333	6
2014	4,194,495,628	490,000,000	2,300,000	664,840,422	3,800,000	42,000,000	4,524	5
2015	6,144,663,036	460,000,000	2,400,000	563,718,826	2,500,000	28,000,000	5,081	7
2016	5,978,397,072	460,000,000	2,500,000	611,164,907	1,400,000	29,000,000	6,290	11
2017	6,244,065,974	450,000,000	2,500,000	637,792,407	2,000,000	28,000,000	7,384	18
2018	3,591,309,709	560,000,000	2,600,000	493,711,193	2,200,000	23,000,000	7,932	16

Source: World Bank, IMF, ICTD, NRA, 2020 (Own computation)

Appendix 5: Legal and Policy Reforms: 2003-2018

National Revenue Authority (NRA)			
Legal and Tax Policy Reforms			
No	Reform	Year	Status
1	The development and implementation of the Excise Act of 1982	2016	Completed
2	The development and implementation of the Customs Tariff Act of 1978	2014	Completed
3	The drafting and implementation of the Income Tax Act regulation	2018	Completed
4	The drafting and implementation of the GST Act regulation	2018	Ongoing
5	The enactment of the Extractive Industry Revenue Act	2015	Completed
6	The Consolidation of Customs' Regulations	2016	Completed
7	The Legislation of a royalty charge of 0.5% on turnover for telecoms service providers	2018	Completed
8	The revision of license fee for alluvial and small scale mining fisheries operators	2018	Completed

Source: MRP Department, NRA, 2020

Appendix 6: Tax Administration and Systems Reforms: 2003-2018

National Revenue Authority (NRA)			
The Tax Administration and System Reforms			
No	Reform	Year	Status
1	The establishment of the Non-Tax Revenue Department	2004	Completed
2	Introduction of Taxpayer Identification Number (TIN)	2009	Completed
3	Implementation of a Finance and Admin Management Information System (MIS) called GREAT PLAINS dynamics	2011	Completed
4	The establishment of the Domestic Taxes Department	2011	Completed
5	Establishment of the Revenue Intelligence and Investigation Unit	2012	Completed
6	Introduction of Value Added Tax Information Processing System (VIPS)	2012	Completed
7	Development and Implementation of the Domestic Tax Information System	2012	Completed
8	Establishment of the Extractive Industry Revenue Unit (EIRU)	2014	Completed
9	Implementation of enhanced banking module for capturing payment of domestic tax	2014	Completed
10	Implementation of a Revenue Accounting and Reconciliation System	2015	Completed
11	Implementation of a Non-Tax Revenue System (NTRS) for mining, fishery and forestry royalties and licenses	2016	Completed
12	Development and Implementation of a Customer Call Center	2016	Completed
13	Introduction of Electronic Document Management System (EDMS)	2016	Completed

14	Creation of Advanced Database for Duty and Tax Exemptions Monitoring and Reporting	2016	Completed
15	The formation of the Customs Services Excise Department	2016	Completed
16	Introduction of Compliance and Enterprise Risk Management	2016	Completed
17	Development of a Price Reference Database for Customs valuation and interfacing of same with Pricing Data of Cargo Tracking Company	2016	Completed
18	The full use of mobile scanners for non-intrusive methods of import examination	2017	Completed
19	Migration from ASYCUDA++ to ASYCUDA World and Customs Single Window	2018	Completed
20	Introduction of Integrated Tax Administration System (ITAS) for domestic tax administration	2014	Ongoing
21	Introduction of the electronic cash register for GST administration	2014	Ongoing

Source: MRP Department, NRA, 2020

Appendix 7: The employment profile of Sierra Leone: 1991-2018

Year	Total Employment (% of the total population)	Agriculture (% of total employment)	Industry (% of total employment)	Services (% of total employment)	Wage and salaried workers (% of total employment)
1991-2002	62	70.8	6.1	23.1	9.3
2003-2018	59.9	62.6	5.9	31.5	10.4

Source: ILO estimates, 2020 (Own computation)

Appendix 8: Tax and Royalty rates in Sierra Leone

Tax Rates in Sierra Leone: 2000-2018												
Year	Direct Income Taxes o/w:											
	PAYE	CIT	Turnover Tax Rate	Rent Income Tax	Capital Gains Tax	W/H Tax on Resident Contractors	W/H Tax to Non-Resident Contractors	W/H Tax on Imports	Pensions and Annuities	Payroll Tax	Tax on Dividend	Tax on Interest payment
2000-2010	25%-40%	-	-	-	-	-	-	-	-	-	-	-
2011-2015	15%-30%	-	-	-	-	-	-	-	-	-	-	-
2016-2018	15%-35%	-	-	-	-	-	-	-	-	-	-	-
2000-2001	-	35%	-	-	-	-	-	-	-	-	-	-
2002-2018	-	30%	-	-	-	-	-	-	-	-	-	-
2013-2018	-	-	2%-6%	-	30%	-	-	-	-	-	-	-
2000-2018	-	-	-	10%	-	-	-	3%	15%	25%	10%	15%
2000-2015	-	-	-	-	-	5%	10%	-	-	-	-	-
2016-2018	-	-	-	-	-	5.5%	10.5%	-	-	-	-	-
Indirect Taxes o/w:												
Year	Domestic GST	Import GST	Import Duty on Petroleum	Export Taxes for most products	Export Taxes on Diamond							
2010-2018	15%	15%	5%	0%	3%							
Royalty Rates												
Natural Resource	Rate											
Minerals obtained from artisanal mining licence	3%											
Precious stones other than special stones	7%											
Special stones	8%											
Precious metals	5%											
Iron Ore, Rutile, and Bauxite etc.	3%											
Crude Oil	10%											
Natural Gas	5%											

Source: Sierra Leone National Revenue Authority and the Extractive Industry Revenue Act, 2018

Appendix 9: The employment profile of Sierra Leone: 1991-2018

Year	Total Employment (% of the total population)	Agriculture (% of total employment)	Industry (% of total employment)	Services (% of total employment)	Wage and salaried workers (% of total employment)
1991- 2002	62	70.8	6.1	23.1	9.3
2003- 2018	59.9	62.6	5.9	31.5	10.4

Source: Own computation from the 2020 ILO estimates