UNIVERSITY OF GHANA

SERVICES SECTOR CONTRIBUTION TO TAX REVENUE GENERATION AND ECONOMIC GROWTH IN GHANA: A CASE OF THE TELECOMMUNICATION SUB-SECTOR

BY

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A THESIS PRESENTED TO THE UNIVERSITY OF GHANA IN PARTIAL FUIFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF PHILOSOPHY IN ECONOMICS

JULY, 2018

DECLARATION

I, Rebecca Ninson, author of this thesis do hereby declare that except for the references cited, which have been duly acknowledged, this work, "**SERVICES SECTOR CONTRIBUTION TO TAX REVENUE GENERATION AND ECONOMIC GROWTH IN GHANA: A CASE OF THE TELECOMMUNICATION SUB-SECTOR"** is the product of my own research and initiative under the supervision of my Supervisors, Dr. Abel Fumey and Prof Edward Nketiah-Amponsah.

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ABSTRACT

This study investigates the contribution of the Services sector to total tax revenue and economic growth in Ghana, with particular focus on the Telecommunication subsector. Quarterly time series data for the period 2008 to 2016 was used for the analysis within the Autoregressive Distributed Lagged (ARDL) framework. Additional qualitative information was elicited from key tax administrators to ascertain the challenges confronting tax mobilization in the telecom subsector to authenticate the empirical findings.

The findings revealed that there exist short run and long run relationship between the Information, Communication and Telecom tax revenue on total tax revenue and economic growth, suggesting that, revenue from the ICT tax positively influences economic growth in both periods, which implies, the services sector significantly contributes to economic growth in Ghana.. In addition, the ICT revenue in the short run positively affects total tax revenue and economic growth. But, the long run results indicates a negative effect on economic growth and exerts positive influence on total tax revenue. This may be due to government subsidization policy on cost of ICT infrastructure to make ICT services accessible to all.

The qualitative aspect of the study showed that some mobile telecoms operators do not honour their corporate tax obligations regularly. Also, given the complexity of the telecom operations, there is a base erosion and profit shifting that makes Telecom companies under estimate taxes

For policy purposes, the study suggests that the government should strengthen the tax administrators in Ghana with the needed training and logistics to effectively assess, audit and collect taxes from the ICT and Telecom sector to maximize revenue mobilization. Additionally, GRA should liaise with NCA to foster and sensitize not only the registered

telecom operators, but the informal ones. This will help widen the tax net and even with marginal tax rates more revenue will be realized for accelerated economic growth.

DEDICATION

I dedicate this project work to Jehovah God, for endowing me with wisdom to pursue Master of Philosophy in Economics programme. I also dedicate this thesis to my beloved husband, Daniel Ninson and my lovely children Bridgette, Ernestina and Timothy.

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ACKNOWLEDGEMENTS

This piece of work would not have been possible without a great deal of guidance from some key personalities and a wide range of books and publications, the sources of which are acknowledged in the text.

First and foremost, I wish to express my utmost gratitude to the Almighty God for giving me the strength to embark on and to complete this thesis. My appreciation also goes to my supervisors; Dr. Abel Fumey and Prof Edward Nketiah-Amponsah for their useful guidance, comments and valuable advice on my thesis. I am indebted to Ghana Revenue Authority, Bank of Ghana, Ghana Investment Promotion Centre, Ministry of Finance, Ghana Statistical Service and National Communication Authority for providing me with data and other relevant materials which has enriched my thesis.

My next thanks go to Ghana Statistical Service for granting me study leave to pursue this relevant programme. I owe all lecturers of the Economics Department, University of Ghana a great deal of gratitude for their resourceful lectures, which has contributed to the success of this project work.

I owe a profound gratitude to all my course mates, especially Danny Turkson and Mary Kafui Nyarkpoh for their assistance and encouragements. Not forgetting, Mr. Yaw Adu-Twum for his support. To my husband Daniel Ninson and children, Bridgette, Ernestina and Timothy, thank you for your wonderful prayers and support. My final but not the least thanks go to all individuals who in diverse ways contributed to the success of this thesis. May Jehovah God reward them and prosper all their endeavours.

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LISTS OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributed-Lag
BEPS	Base Erosion and Profit Shifting
BoG	Bank of Ghana
CEPS	Customs, Excise and Preventive Service
CIT	Corporate Income Tax
CST	Communication Services Tax
DF	Dickey -Fuller
DTRD	Domestic Tax Revenue Division
ECM	Error Correction Model
ERP	Economic Recovery Program
FDI	Foreign Direct Investment
FDI	Foreign Direct Investment
GCMS	Ghana Community Management Systems
GC-NET	Ghana Community Management Systems
GDP	Gross Domestic Product
GSS	Ghana Statistical Service
HIC	Hannan-Ouinn Information Criterion
ICT	Information, Communication and Technology
ICTR	Tax Revenue from the ICT/Telecom Sector
IMF	International Monetary Fund
INF	Inflation

IRS	Internal Revenue Service
ISIC	International, Standard Industrial Classification
ISSER	Institute of Statistical Social and Economic Research
LTU	Large Taxpayers Unit
MoF	Ministry of Finance
NCA	National Communication Authority
NFSL	National Fiscal Stabilization Levy
NHIL	National Health Insurance Levy
NPP	New Patriotic Party
OECD	Organisation for Economic Co-operation and Development
PAYE	Pay-As-You- Earn
PIT	Personal Income Tax
PNDC	Provisional Defense council
PP	Phillips-Perron
RER	Real Exchange Rate
RIR	Real Interest Rate
SBIC	Schwartz-Bayesian Information Criterion
SSSS	Single Spine Salary Structure
TIN	Taxpayer Identification Number
TTR	Total Tax Revenue
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
VAT	Value Added Tax
VIT	Vehicle income Tax

WDI	World Development Indicators
WTO	World Trade Organization

CHAPTER ONE

INTRODUCTION

1.1 Background

Domestic revenue generation is very crucial for socio- economic development of a nation. This is because governments depend mainly on revenue generated through taxation to provide social goods and services needed for the populace which is critical for human development. Mobilizing sufficient revenue is key for every government given the ever-increasing public expenditures of governments of both developing and developed countries. Mobilization of adequate resource through taxation is therefore necessary to meet their expenditures in the provision of basic social amenities such as roads, educational infrastructure, health facilities, defense among others needed for the well-being of the citizenry. The services sector in Ghana has been a potential area of taxation in these recent times. It has shown phenomenal growth by leaving traditional sectors like agriculture and industry far behind. This sector has been playing a predominant role in the Ghanaian economy and contributing more than 50 percent to the Gross Domestic Product (GDP) of the country (GSS, 2016). It has proved that service sector is more vibrant sector in the economy and acting as the trigger for the development of the country. Therefore, the government can take advantage of this sector's expansion to boost revenues through taxation in order to meet its expenditure targets and raise additional needed revenue for accelerated growth.

Globally the service sector is gathering pace and has become the prime driver of economic growth since the early 2000s. For instance, the service sector has become the main

contributor to national and states incomes, trade flows, FDI inflows, and employment not only in developed economies like USA, Japan and U.K, but also in developing economies like China, Indonesia, Pakistan, India and Ghana. In terms of growth, the services sector contributed US$ 70.2 trillion in 2011 with the share of services sector accounting for 67.5 per cent, over the same period. Moreover U.S, China, Germany, France, Brazil, UK, and Italy have contributed more than 65% of share of services. India, for instance is ranked 9th in overall GDP and 10th in services GDP. India's very high current aggregate growth rate of 9.2per cent which was second highest was also accompanied by the highest change in services sector share (Balachandran and Malini, 2013). The services sector has taken over the industrial sector in these recent times. For instance, China and India's growth has been driven mainly by the service sector. The World Trade Organization (WTO) data indicates that, the services sector is the fastest growing sector of the global economy and contributes 70 per cent of global output and accounts for a quarter of total global trade and employs one third of the workforce (ISSER, 2015).

The trend of the service sector performance has not been different for Africa in terms of growth. For instance, Hassan and Abudullah, (2015), showed that services sector accounted for more than half of the total GDP in developing countries, while Sub-Saharan Africa recorded an average of 47 percent during 2000 to 2005. Industry accounted for 37 percent while Agriculture sector recorded only 16 percent during the same period. The remarkable growth performance in these countries, according to the authors was due to demand of services, in the primary (agriculture) and secondary (construction and manufacturing)

sectors. This implies that economic growth in Africa in recent times depends heavily on the services sector and hence points to its relevance to growth.

Balachandran and Malini (2013) showed the dominance of the services sector to India's GDP and evaluated the performance of service tax in India in terms of revenue generation and its share in the total tax productivity of India. Evidence from their study indicated the tertiary sector (i.e. service sector) is progressing faster in terms of growth in GDP and capacity to raise much revenue for the government. They assert that tax experts perceive that service tax has abundant potential for revenue generation.

Ghana's services sector, in recent times has also shown phenomenal growth by outstripping the traditional economic sectors (agriculture and industry). This sector has been playing a predominant role in the Ghanaian economy and contributing more than 50 percent to the GDP of the country. World Bank data show that the services sector has dominated the other sectors; namely mining and quarrying, manufacturing, agriculture and industry in terms of its contribution to Ghana's Gross Domestic Product (GDP) since 2011. For instance, the services sector contributed 49.3 percent of GDP in 2012, recording the highest growth rate in the year under review, which exceeded the 2012 target of 7.7 percent by 1.1 percentage points to register a growth of 8.8 percent (MoF, 2013). The services sector indicated an increase in its share of GDP for Ghana from 53.3 percent in 2015 to 54.3 percent in 2016 (MoF, 2017) compared with agricultural and industrial sectors that decreased from 20.3 percent to 18.1 percent in 2015 and 25.1 percent to 24.3 percent in 2016 respectively. In terms of growth rate, service sector of the country is seen to perform remarkably than the other main sectors (agriculture and industry) with an average growth rate of 8.4 percent

between 2010 to 2016, compared to agriculture and industry which recorded an average of 3.5 percent and 5.4 percent respectively, over the same period (see Table 1.1). The services sector share to total revenue dominates the traditional sectors, though the trend oscillates between 2010 and 2014, however in 2015, it increased marginally from 61.4 percent to 62.4 percent in 2016. This points to the relevance of the services sector to the growth of the economy.

Evidence show that the main driving force for services sector growth is the information and communication sector (NCA, 2017: ISSER, 2016). Balachandran and Malini (2013) show that the ICT sector has both forward and backward linkages to the traditional (agriculture and manufacturing) sectors. The expansion of the ICT sector will not only improve the fiscal revenue, but also contribute to the growth of other sectors, leading to robust and sustainable growth and development.

Currently, the growth of the ICT sector is seen to be powered by telecommunication services which drives firm related services in both manufacturing and businesses, considered as an indicator of Ghana's economic growth progress. For instance, the boom in the Telecommunication services in Ghana over the past decade is seen by as a clear indication of how growth in the services sector can spur growth in other sectors of the economy (ISSER, 2015).

Table 1.1a: GDP Growth Rate at Constant Prices

GDP Growth Rate (in Percentages)								
Sector	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016***	**Average**
Agriculture	5.3	0.8	2.3	5.7	4.6	2.8	3.0	3.5
Industry	5.6	16.0	8.5	3.6	-0.3	-0.7	4.9	5.4
Services	9.8	9.4	12.1	10.0	5.6	6.3	5.7	8.4

Source: GSS (2017)

* indicate revised estimate

Table 1.1b: Percentage Share in Total

	Percentage Share in Total tax Revenue							
Sector	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Average**
Agriculture	0.6	0.5	0.6	12.1	3.4	1.3	0.5	2.7
Industry	34.5	41.9	40.0	33.2	47.3	37.4	37.1	38.8
Services	64.9	57.5	59.4	54.7	49.3	61.4	62.4	58.5
Total	100	100	100	100	100	100	100	100

Source: Authors computation from GRA tax collection

* indicate revised estimate

In spite of the structural and technological changes within the services sector which has enhanced its contribution to the economic growth of the country, very little empirical work has been done to ascertain its impact on tax revenue productivity in Ghana, particularly the Telecom sub-sector of country specific level. The question, is how has the services sector contributed to revenue generation following its expansion in these recent times? Is its productivity matched by

tax revenue capacity of the sector? As the best performing sector in terms of economic growth, how can the government maximize its revenue target by boosting revenues through taxation from that sector? Given that the services sector is driven by the ICT sector with the telecommunication subsector as its dominant component (70 percent) of ICT services (ISSER, 2015), what policies can the government put in place to further expand the Services sector and its sub-sector to produce at its utmost capacity? It must be noted that the growing increase in interest in Telecommunication Industry which is creating related business outlets, the study is motivated by the dearth of research on the services sector. The study attempts to explore the contribution of service sector to domestic tax revenue mobilization and growth using the ICT subsector and to find out challenges tax administrators face in the collection of taxes from the ICT sub-sector

1.2 Statement of the Problem

Ghana has experienced mismatch in government expenditure and domestic revenue mobilization over the years. Expenditure is to match revenue collection to ensure accelerated growth, and taxation is a means of raising needed revenue for governments to fund its expenditures. In most developing countries therefore there exist increasing gaps between government expenditures and revenue (Twerefou *et al*, 2010), this is precipitated in the quest to meet the socio economic demands of the people to promote economic growth and development. However, government expenditure does not match the revenue collection efforts which often exert budgetary pressures on the economy leading to chronic budget deficits. The decision of the Ghanaian government to adopt policies that is capable of increasing its revenue collection and thus fill the gap between Ghana's revenue base and government expenditures is very paramount.

The Information and communication sector is estimated to be the best performing subsector in the services sector from 2014 to 2016 as compared to the other sectors (see table 1.2). It is also estimated to grow at 14.4 percent in GDP in 2016, an improvement over the 13.4 percent registered in 2015 (MoF, 2017) as against the other Subsectors which performed as follows: Health and Social Work at 10.8 percent; Public Administration, Defense and Social Security at 8.1 percent; and Education at 7.9 percent

In spite of the contribution of the services sector to GDP, and given that telecommunication drives the ICT sub-sector according to a study by ISSER in 2015), available literature shows that not much work has been done by researchers to explore the telecommunication sector in the area of sourcing domestic revenue to boost the country's resource base and the subsector's potential in raising revenue for the country has not been exploited. Given that there exist a revenue-expenditure gap in the country, the questions that arise are: Has the sub-sector contributed significantly to domestic tax revenue of the country? How has the sector contributed to GDP growth? What are the challenges confronting tax administrators in the collection of Telecom tax, how can these challenges be addressed to improve the sub-sector's performance and harness its capacity in terms of increase in tax revenue generation and its impact on economic growth and sustainable development?

1.3 Objective of the Study

The main objective of this research is to analyze the contribution of the telecommunication subsector to domestic tax revenue generation and its extension on economic growth in Ghana. Specifically, this study attempts to:

i. examine the contribution of the telecommunication sub-sector to domestic revenue mobilization in Ghana for the period 2008 to 2016

ii. ascertain the challenges encountered in mobilizing tax revenue from the subsector

iii. To examine the extent to which tax in the telecom sector has contributed to GDP growth in Ghana from 2000 to 2015.

1.4 Research Questions

To determine the services sector contribution to domestic tax revenue generation, in particular the telecommunication sector, and how it influences economic growth in Ghana, the study seeks to answer the following questions:

i. What is service (telecommunication) sector contribution to domestic tax revenue over the period under study?

ii. What are the challenges confronting tax administrators in the collection of taxes from the telecommunication sub-sector in Ghana?

iii. To what extent has service telecommunication subsector influenced economic growth in Ghana?

1.5 Significance of the Study

Most studies on services sector has focused on what drives its output growth and growth potentials since the past two decades (Enu et *al*, 2015; Gani and Clemes, 2002; Rácz, 1972; Yueh, 2013). The outperformance of the services sector globally, has attracted the interest of many researchers from across the world. The services sector expansion has created many job opportunities in all the sectors of the economy. This has led to increased investment and

employment opportunities for many economies across the globe. Whether the services sector remarkable output growth experience is sustainable is shared among many researchers with mixed feelings. However experts perceive that in future its performance will still outgrow the other sectors (Banga and Golder, 2007; Enu et *al* 2015; Mini, 2015; Yueh 2013).

Ghana services sector is being driven by transport and storage, banking and finance services, and information and communication (Enu *et al.*, 2015) Given the latter out performance, for instance, estimates show that, it grew at 14.4 percent of GDP in 2016, representing an improvement over the 13.4 percent registered in 2015 (MoF, 2017) as against the other sub-sectors which performed as follows: Health and Social Work, 10.8 percent; Public Administration, Defense and Social Security, 8.1 percent; and Education, 7.9 percent (ISSER, 2016) Despite the socio-economic role played by the ICT sub-sector and for that matter services sector in general, studies to validate these contributions, particularly the telecommunication sub-sector in line with tax revenue mobilization can hardly be found in Ghana. Other works on Services sector and tax revenue generation and growth has been done elsewhere in India and the Asian countries (Balanchandra and Malini, 2013, Gani and Clemes, 2002).

This work will serve as a valuable source of information to shape governments efforts to promote ICT and telecom services in the country. The work will help government track tax revenue contribution of the ICT sector and contribute largely to tax revenue mobilization in the Country. This work complements that of Enu et al. (2015) because unlike Enu et al. (2015)'s work which focused on what determines Services sector output growth in Ghana,

this work looks at revenue contribution of the services sector in Ghana with ICT subsector as the focus since it is believed by experts that the latter, drives service sector growth in Ghana.

Table 1.2 Services sector components contribution to tax revenue in Ghana

Services subsector/ Year	2010	2011	2012	2013	2014	2015	2016
Wholesale & Retail	206.66	263.11	417.05	339.08	928.93	1,171.88	1,596.51
Hotel & Restaurant	14.05	18.59	20.95	35.62	275.64	624.97	631.25
Transport	26.17	59.40	106.28	136.10	88.13	183.67	180.30
Storage	101.77	98.39	77.69	81.98	371.17	951.70	998.79
Communication	168.13	183.52	277.75	286.16	1,020.18	1,611.64	1,831.67
Financial Intermediation	317.18	532.97	658.58	678.04	82.24	131.78	120.96
Real Estate & Renting Activities	25.09	35.30	40.33	108.64	201.72	392.35	485.44
Computer, Research & Development	16.16	19.94	17.91	25.77	59.01	58.38	55.59
Other Professional & Bus. Activities	79.47	127.59	119.01	171.99	1,218.40	1,372.05	1,443.72
Public Administration & Defence	375.73	505.79	1,191.14	1,058.89	116.45	182.42	217.82
Education	59.59	68.64	104.73	95.77	45.73	68.08	79.36
Health & Social Work	18.80	25.77	30.30	35.07	11.30	10.26	14.86
Other Social & Personal Service Activities	76.52	74.57	81.99	80.95	219.98	420.38	421.50
Private Household Employment	1.52	0.45	0.62	1.81	1.53	9.21	0.24
Extra-Territorial Org. & Bodies	8.50	9.77	9.98	10.15	8.53	15.43	11.75
Total	**1,495.34**	**2,023.79**	**3,154.29**	**3,146.03**	**4,648.91**	**7,204.20**	**8,089.76**

Source: Author's own computation from GRA Total tax collections

1.6 Organization of Research

The study will be organized into Six Chapters, Chapter one gives the main introduction of the study; which will comprise of the background, Statement of the Problem, objectives, research questions, the significance of the study, scope as well as the organization of the study. Chapter two presents the overview of the Services sector and Fiscal Developments in Ghana, with emphasis on the telecommunication subsector. Chapter three outline the theoretical and empirical review of relevant literature of the subject matter. Chapter four gives the model specification and estimation procedures and data for the study. Chapter five reports the empirical results and the discussions while chapter six concludes the study and gives suggested policy implication and recommendations.

1.7 Scope of the Study

For the purpose of this study, the ICT sector is used, since the data is classified according to the International, Standard, Industrial Classification codes (ISIC) and therefore revenue data is not disaggregated to capture only telecommunication revenue from the ICT sector. However, given that the ICT sector is heavily dominated by the Telecommunication sub-sector about 70% of the share in total ICT (NCA, 2017). The study utilized the revenue of the former as a proxy for that of the latter.

It must be noted that, due to insufficient number of observation of annual series in carrying out a rigorous and dynamic interrelationship between revenue productivity and telecommunication subsector, the study will resort to quarterly time series data. Given that, the methodological framework used by the study requires sufficient data points for a

comprehensive and meaningful analysis. Since complete data from the same source is hardly to come by in Ghana, varied sources are resort to, due to unavailability of continuous data points for the period under review. Notwithstanding, findings from the study are very accurate and reliable and may be useful for other research and policy purposes, hence contributing to work on revenue mobilization shared by other researchers.

CHAPTER TWO

OVERVIEW OF THE SERVICES SECTOR AND FISCAL DEVELOPMENTS IN GHANA

Ghana is among a host of countries that highly depends on taxation as its main source of revenue to finance its public expenditures. However, over the past two decades, the government' expenditure exceeds revenue and the gap is often funded with foreign aid which has perpetuated the aid dependency of the country (Osei and Quartey, 2005). With the present NPP agenda to move the economy beyond aid and to reduce the gap between government revenue and expenditure, the option at its disposal is to generate more revenue from vibrant sectors such as services sector to spend on other less performing sectors to boost the economy for accelerated growth.

2.1 Ghana's Tax Reforms

Ghana has undergone major tax reforms since the inception of the economic recovery programme (ERP) in 1983. The objective was to improve among others the efficiency of the tax system in Ghana. Thus, a major aspect of the economic reforms has involved the reform of the tax system. The tax reforms has focused on three main overlapping stages, namely, (i) a restoration of the tax base, (ii) strengthening production incentives for domestic and foreign investors, and (iii) enhancing efficiency in tax administration, which involved strengthening and building capacity of the revenue collection agencies, as well as improve their morals so as to facilitate and monitor taxpayer compliance and prevent noncompliance (Osei and Quartey, 2005).

The first stage was implemented between 1983 and 1984, during that period, the exchange rate was adjusted in order to increase receipts from cocoa export taxes and import duties. In addition, the increased availability of foreign exchange, due to donor inflows stimulated import expansion and consequently, the base of import taxes. Hence, the tax reform measured over this period were designed mainly to restore the tax base, which had declined due to over-valuation of the domestic currency and the large margin between official and market prices (Kusi, 1998). The reforms also aimed to widen the tax net, reduce evasion, and lower the tax burden.

In 1983, a multiple exchange rate system was introduced which imposed surcharges on foreign exchange payments and granted bonuses on foreign exchange receipts. Two exchange rates operated initially but these were eventually unified in 1988. Consequently, there was a revision of the system, in the area of tax assessment for import duties, sales and purchase taxes. These taxes were revised to make the basis for dutiable goods reflect their full face value, in addition to certain surcharges. Also, the basis for tax assessment for corporate income tax was changed from profits of the previous year to actual income earned during the current year (Kusi, 1998) Tax reform is of importance if it results in an improvement in tax revenue (Osei and Quartey, 2005; Terkper, 2016).

In terms of production incentive, the tax reform process in Ghana took another form with the introduction of the investment code (PNDC Law 116, 1985). The code provided a range of incentives for domestic and foreign investors, covering four priority areas, namely, agriculture, manufacturing, construction and buildings, and tourism.

In 1986, a new minerals law (Minerals Commission Law, 1986) was introduced. The minerals law modified eight existing laws, and sought to clarify mining rights as well as provide new incentives for investors. The incentives extend to corporate tax allowances, capital allowances under which it is possible for companies to write-off between 40 per cent and 100 per cent of capital investment against taxes.

In 1987, the corporate tax rate on manufacturing was reduced from 55 per cent to 45 per cent. Also, all excise duties on products other than petroleum, beverages and tobacco were abolished with the revenue loss being compensated with an increase in the general sales tax rate from 10 per cent to 20 per cent and subsequently to 25 per cent.

In 1986, other measures to improve efficiency in tax collection were the conversion of the IRS and CEPS into autonomous bodies with new organizational structures similar to those of state-owned enterprises. In addition, new incentive policies for the staffs of IRS and CEPS were introduced to improve productivity in tax collection. Also, between 1986 and 1992, the IRS operated with ministerial powers alongside the Ministry of Finance but this full autonomy has been partially reversed (Kusi 1998).

The general sales tax was reduced to 22.5 per cent in 1989. Similarly in 1990, the special taxes that had been introduced in 1988 to protect local industries were compressed into a uniform rate of 10 per cent since it has become evident that these various taxes were encouraging inefficiency in local production and rendering local industries internationally uncompetitive. At the same time, the import licensing requirements were gradually removed and duty rates lowered by 5 percentage points, thereby reducing the primary import tariff on

most goods. By 1991, corporate taxes on real estate, manufacturing and construction had been reduced to

35 per cent. Also, corporate taxes (banking) were reduced from 50 per cent in 1991 to 40 per cent in 1992.

The focus of tax reforms was broadened after 1986 in order to enhance efficiency in tax administration and to ensure equity within the tax system. Until 1986, the tax administrative system was not adequately monitored nor was tax compliance ensured. Hence, a major element of tax reform was to strengthen the revenue collection agencies to ensure that they increase revenue and also to change the structure of the tax system to make it more efficient and equitable. The year 1985 witnessed the birth of three autonomous institutions, namely, National Revenue Secretariat (NRS), Customs Excise and Preventive Service (CEPS) and the Internal Revenue Service (IRS). The NRS was responsible for supervising the activities of CEPS and IRS as well as recommending revenue policy to the government.

In 1993, a major shift in the Ghanaian tax system that was intended to improve tax efficiency, which led to the introduction of the value-added tax (VAT). The contract for the design and implementation of VAT was signed in 1993. In December 1994, the VAT became operational, similar to the Canadian system, (see Terkper, 1995). A bill was passed into law to become effective in March 1995, when it became operational at a flat rate of 17.5 per cent compared with the earlier sales tax rate of 15 per cent. A few months later in June, VAT was withdrawn after mass demonstrations in almost all the regional capitals within the country and a 15 per cent sales tax was re-introduced in 1998.

In 1999, the VAT offices in all the regional capitals were re-opened. In addition to the re-introduction of VAT, renovation and rehabilitation work on residential houses for the staff of CEPS and the computerization of the Long Room at CEPS (Tema) were completed.

In 2000 an income tax law (Act 592, 2000) was passed and became operational in 2001. The minimum taxable personal income was raised from 0.9 million Cedis to 1.2 million Cedis and the top marginal rate of 35 per cent for incomes in excess of 17.4 million Cedis was applied to incomes exceeding 48.0 million Cedis. In addition, the top marginal rate was reduced from 35 per cent to 30 per cent for the higher-income group and from 25 per cent to 20 per cent for the middle-income groups. There were other tax reliefs such as tax concessions for dependent children, tax allowances for disabled businessmen, tax relief for persons over 60 years of age, and tax reductions for a person sponsoring the education of his or her child was given.

During 2002 the automation of clearing procedures was completed with the installation of the Ghana Customs Management System (GCMS) and the Ghana Community Network (GC-Net) computer-based information systems at Tema and Kotoka International Airport and at the CEPS headquarters. The objective was to reduce leakage in revenue and minimize physical contact between traders and customs officers, so as to ensure greater efficiency in achieving a target clearance period of one or two days. Also, a service charge of 5 per cent was to be levied by CEPS on companies, which processed warehoused and re-exported goods. A large taxpayers' unit (LTU) comprising 350 tax-paying entities was launched in the middle of the year. In support of the LTU and other tax initiatives, a system of taxpayers'

identification numbers (TIN) was set up and all revenue agencies were to ensure its implementation. The Taxpayer Identification Number Law was subsequently passed in accordance with Section 123 of the Internal Revenue Service Act 2000 (592), was amended to incorporate requisite guidelines for companies wishing to submit tax returns in foreign currency. Government proposed legislation action to narrow the scope of VAT exemptions and to bring more tax payers into the tax net.

In order to further improve efficiency in tax collection, CEPS proposed in 2003 to collaborate with destination inspection companies to minimize under-invoicing of poultry products and to ensure the good quality of poultry products being imported into the country. Export duty on lumber was reduced, taxes on insecticide-treated materials were waived and VAT on salt was eliminated. The CEPS bonded warehouse scheme was reviewed. Stamp duty on share capital was reduced from 2 per cent to 0.5 per cent.

2.2 Optimal Taxation

Optimal tax theory still has and continues to have significant influence on academic research in tax reforms. The realization of additional revenue increases the public resources for government that enables the government meets it ever increasing expenditures and channels those resources for developmental activities that improves the lives of its citizen and stimulate economic growth.

Optimal taxation evaluates the effects of tax reforms as well as assumes that the tax administration is good. On the other hand, available literature indicates lack of administrative capacity in recent reform experiences Thus, the need for simpler administrative structures in

virtually all developing countries. Optimal taxation has had little impact on tax reform in developing countries; in addition he argues that under the optimal taxation approach, the analysis of revenue productivity of a tax would be of less significance.

Ramsey (1927) begun with optimal taxation theories that are similar to the principles of taxation, however, the topic was much considered in the 1970s following the Diamond-Mirrelees papers of 1971.

The principles of optimal taxation can generally be summarized as follows:

i. Tax revenue is to be generated in an effective way by taxing goods or factors with inelastic demand and supply and
ii. Taxation is concerned with distribution and externalities (both positive and negative) or market failures should address the problem as much as possible.

In the case of distribution, taxation should be geared toward areas where there exists resource inequality, whilst in the case of externalities, one should attempt to tax the good or activities of negative externality or subsidize those that exert positive externality. Newberry (1988) argues that where equity and efficiency must balance, as in the design of direct and indirect taxes on consumers, the tax rates will depend on the exact form of the social welfare function.

Optimal taxation as viewed by reform, are based on rigorous economic theory as stipulated by Thirsk (1997) that emphasized putting them into operation lead to inherently large number of rates, which would be difficult to calculate and infeasible in administer effectively.

However, Slemrod (1990) has argued that the optimal tax theory can serve as a guide in designing an 'optimal tax system' only if; one considers the technology of the tax collection; which is the feasibility of the tax instrument, the cost of administration and compliance.

Thirsk (1997) argues that despite flirtation with the undeniable logic of optimal tax theory, many tax reforms have focused on achieving broader based taxation at more uniform rates unlike the earlier designed ones for broader based taxation. Musgrave also postulates that tax reforms in developing countries involve broad issues of economic policy as well as problems of tax structure design and administration.

Firstly, he pointed out that the main problem of revenue requirement is how to fit the revenue structure into a development policy. This has been an area of concern which includes the impact of alternative taxes on savings and investments and its implications for macro-economic stability of the economy.

Another aspect is securing a fair distribution of the tax burden. Attention needs to be directed to a more specific tax issues such as the composition of the tax structure and that of the design of its major tax components. The aim is not simply to determine what one would consider to be desirable but also to assess administratively and politically feasible. The tax structure in most developing countries is viewed to be characterized by complexity in terms of difficulty in administering and complying with, inelastic (non-responsive to growth and

discretionary policy measures) inefficient (raising little revenues and introducing serious economic distortions), inequitable (treating individuals and businesses in similar groups differently) and unfair (tax administration and enforcements are selective and biased in favour with those of more resources that defeats the tax system (Kusi, 1998).

There is a heavy reliance on international trade that undermines long term international competiveness. User taxes as well as taxes on income and property contributes small proportion to total revenues. Fringe benefits , wealth bequests, land and property income exist in theory but have rendered ineffective by its design problems and lack of administration, both personal and corporate income taxes levied on narrow bases as well as high tax rates. Sales taxes are also levied in an in-orderly manner, thereby skewing to one income group or in some cases full forward shifting (Shalizi and Squire, 1988). Twerefou et al. (2010) embarked on restructuring their system of taxation to seek higher revenue or improve the revenue elasticity and buoyancy of the tax system. Not only to realize larger revenue but also to ensure that the reform processes will eliminate the disincentive effects of the level of taxation: to reduce the economic inefficiencies that may be induced by the discretionary. Although tax progressivity remains high on political agenda in theory, more often political will is geared towards income tax compliance enforcement, cash flow taxes philosophical ideologies and transitional issues continue to dominate current discussions.

Total government revenue in Ghana is derived from two sources, which can be classified as tax revenue, and non-tax revenue. Tax revenue collection is solely the responsibly the GRA board itself, and Customs and Excise Preventive Service (CEPS). The responsibility for the

collection of non-tax revenue is based on the type of income. Direct tax revenue consists of income tax from individuals, companies, and other persons as well as petroleum, stamp duty, estate duty and real property gains. Indirect taxes are collected by the Customs and Excise Department consists of tax revenue, and is not imposed directly on the taxpayer. Since the 1960's, indirect tax has become the major contribution to government revenue. Indirect taxes consist of import duties, export duties, excise duties, sales tax and service tax. Non-tax revenues consist of fees for issue of licenses and permits, fees for specific services, proceeds from the sale of government assets, rental of government property, bank interest, returns from government investments fines and forfeitures.

Spending increases every year in Ghanaian as well as throughout most of the world. However, the question here is whether sufficient resources are available to fund these expenditures. Careful budgeting is critical and, a good fiscal policy is vital to stimulate a stable economy. Fiscal policy in Ghana can be described as expansionary fiscal policy where there is always an increase in spending and lower taxes. The government always provides better incentives to both individual and company taxpayers. The Ghanaian government spends public money to provide a wide variety of facilities and benefits to the public. From fiscal government reports we can classified the spending to two major categories, current expenditure and development expenditure. Current expenditure consists of emoluments, supplies and services, asset acquisition and routine expenditures. Development expenditure varied from economic services, social services, security and general administration.

2.3 Taxes Administered in Ghana

2.3.1 Direct taxes

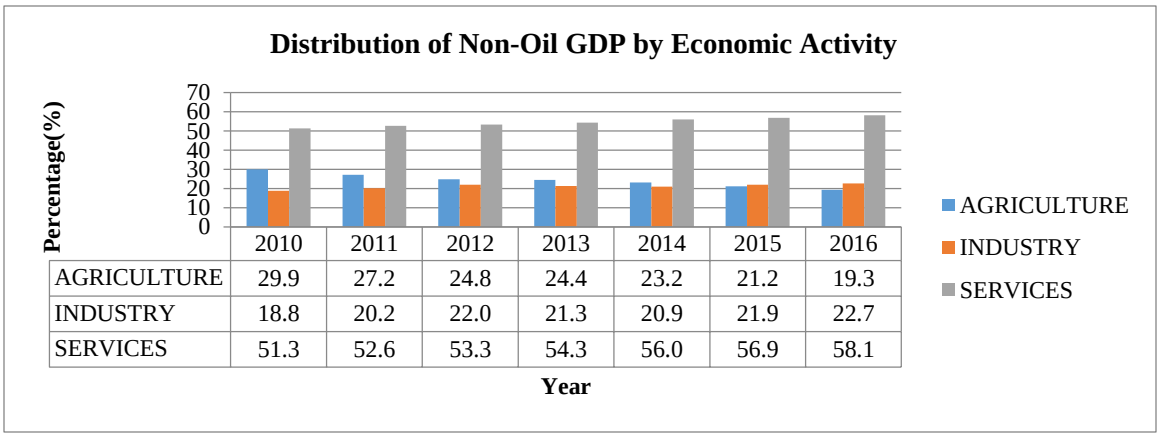
This is a type of tax that is intended to be paid a person or organization on which is directly or actually levied. Direct taxes are progressive in nature payable by individuals and corporate bodies on gains and profits acquired from gainful employment. Direct taxes administered in Ghana consists of Corporate Income Tax (CIT), Personal Income Tax (PIT), Pay-As-You-Earn(PAYE) withholding taxes, Rental Income Tax, Vehicle income Tax(VIT) and Tax stamp among others. Direct taxes payable by the Telecommunication sector are:

2.3.1.1 Corporate Income Tax (CIT)

This is a tax levied on companies on the profit gained in the year under review. Currently the standard Rate is 25%. However companies listed on the Ghana Stock Exchange (GSE) enjoy a reduced CIT rate of 22% within the first three years of entry within Ghana.

2.4 Ghana Sectorial Performance

Figure 2.1 Sectorial contribution to GDP (% Share)



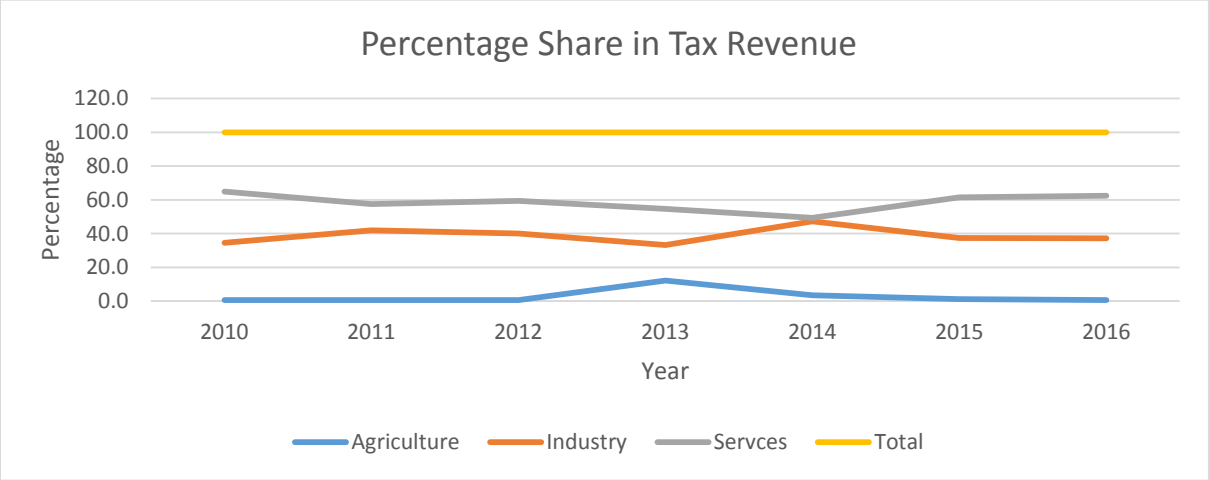
Source: GSS, Revised 2016 Annual Gross Domestic Product

Ghana's economy is categorized into three broad sectors: namely Agriculture, industry and Services sector. Each sector is made up of subsectors. Recent estimates show that the Services Sector is the largest recording the highest growth of 5.7 percent in 2016 followed by Industry of well as a possible guide for the NCA to achieve Ghana's ICT objectives which include promotion of development of the national ICT infrastructure; promotion of the use of ICT in all sectors of the economy; and the provision of affordable broadband for all Ghanaians by 2020., 9 percent while Agriculture recorded a growth rate of 3.0 percent. (GSS, 2016). The expansion of the services sector has the potential to increase output growth and hence may create opportunity to generate more revenue to the government. Figure 2.1 above shows the distribution of the non-oil GDP at basic prices by economic activity.

Globally the services sector is the fastest growing sector, and contributes 70 percent of global output according to the World Trade Organization (WTO). The Sector also accounts for a quarter of total global trade and employs one third of the workforce. (ISSER, 2016) Economic growth in the past decades was typically increased through Agriculture productivity, followed by manufacturing and Services Sector the least contributor to GDP. Recent statistics indicates a different picture in Ghana, as seen in figure 2.1. The services sector recorded an increasing trend in its contribution to GDP in Ghana. For instance, it recorded 56.0 percent share to GDP in 2014, which further increased to 56.9 percentage and 58.1 percent in 2015 and 2016 respectively. As against a downward performance of 23.2 percent, 21.2 percent and 19.3 percent recorded for Agriculture over the same period. The industrial sector has outperformed the traditional sector (Agricultural sector) since 2015 as seen in the figure above. Currently, the growth of the Services Sector is considered to be an

indicator of economic progress. It is believed for instance, that the boom in telecommunication services in Ghana over the past decade is seen as a clear example of how growth in the services can spur growth in the entire economy (Wellenius, 1984; ISSER 2016). With the expansion of the services sector, coupled with rapid population growth in Africa, it is anticipated that a large emerging consumer market and labour force has the capacity to provide significant growth opportunities for the services sector.

Fig 2.2 Trends in Sectorial Tax Revenue



Source: Ghana Revenue Authority (GRA) tax collections

In terms of tax revenue collection, the services sector has consistently contributed substantially in its share to total revenue collection for 2010 and 2011, while agriculture sector performance was the lowest and fairly stable within the same period of time. Though the industry showed a marginal increase over the same period, its share to total tax revenue collection fell in 2013, but picked up in 2014, but in 2015 and 2016, there was a fall in the

proportion of its tax revenue yield. The services sector has consistently been on a rise after the 2014. This may be due to increases in services trade and increase in employment opportunities for the services sector

2.5 Ghana's Services Sector

The remarkable growth of Ghana's services sector has attracted many researcher in these recent times. This is because before the 1990s, the services sector of Ghana has contributed little to GDP at a steady rate. At that time, the agricultural sector was known for its dominance followed by the industrial and then the tertiary (services) sector. However, with time, the service sector has seen incredible performance, notably the remarkable growth in 2010 (ISSER, 2016). Enu *et al.* (2015) showed that the performance of the Ghana's service sector since 2010, has almost doubled in terms of its contribution than the much cherished sector (Agriculture) in two consecutive years (2010 and 2011). The main sub-sectors of the service sector in Ghana include; following subsectors: (i) Trade Repair and Vehicle and Household Goods, (ii) Hotel and Restaurants (iii) Transport and Storage (iv) Information and Communication (v) Financial and Insurance Activities (vi) Real Estate services (vii) Business and other Service Activities (viii) Public Administration and Defense, Social security (ix) Education (x) Health and Social Work; and other community, Social and Personal service activities.

As the best performing sector to GDP of the Ghanaian economy in recent times, government should direct efforts to expand its productivity to enable the country exploit its benefits, not only in terms of mobilizing more revenue but also attract investors into the industries, create

jobs and improve the ease of doing business for the private sector in order to grow the economy

Trade and Repair of vehicles, Households and Goods, Hotels and Restaurants, Transport and Storage, Information and Communication, Financial Intermediation, Business, Real estate and Public Administration and Defense; Social Security, Education, Health and Social Work, Community, Social and Personal has experienced growth. The contributions of most of these sub-sectors in recent times have been most impressive and have aroused interests of experts to examine the service sector more critically; to see how much contributions these sub-sectors have made to the Ghanaian economy, which macroeconomic factors has influenced its impressive performance whether their performances have been consistent over the years.

Studies have shown that the impressive performance of the service sectors has been the result of some key sub-sectors, namely transport and communication, tourism financial institutions (OECD, 2005; Enu et al., 2015). Other sub-sectors including health, education, hotel and restaurants has also performed well. The ICT/Telecom sub-sector has been seen to act as trigger to development through ICT services and innovations. The liberalization of the Telecommunication has enhances social welfare in provision of high skilled services such as mobile banking, mobile money services, broadband and fixed line wireless and internet services among others. This has consequently created job opportunities and enhanced the performance of the services sector.

2.6 Fiscal Developments

Ghana is among the host of countries confronted with public expenditure-revenue gap. The Ghanaian economy experienced fiscal crisis in the 1970s and 1980s. This culminated to fiscal imbalances, which had impacts on domestic prices, interest rates and balance of payments. As a result policy intervention were resorted to, to address such problems. A number of policy instrument were used such as tax reforms in other to modernize the tax system and improve domestic revenue productivity. Insufficient revenue yield to meet public expenditure obligation has caused chronic deficits, which is often financed through, foreign aid. Given that external borrowing is now not forthcoming and the current NPP government's policy initiative to move the economy from depending on foreign aid, with the 'Ghana Beyond Aid' agenda, the option at the disposal of the government is to innovate ideas geared towards expanding the tax base and adopting tax rates or tax instruments that will be least harmful to the tax payer. This will involve among other things boosting tax revenue from productive sectors (like the services sector) to expand the less performing sectors and generate more revenue than currently.

Ghana is among a host of countries that is characterized with challenges in mobilizing adequate resources which is necessary to finance the provision of social services for its citizenry necessary for human development. Macroeconomic stability through prudent fiscal policies has been an agenda for governments to ensure economic growth. With the global financial system that confront African countries in accessing external resources to meet its developmental goals, Ghana would have to increase its efforts by focusing more on raising domestic resources to achieve its set targets. Macroeconomic stability through prudent fiscal policies has been and continues to be the agenda for most governments as a tool in ensuring

accelerated economic growth. As a result, efforts to expand the tax -base and mobilize additional revenues to fill revenue- expenditure gap has been high on Ghana's agenda in recent times. Fiscal deficits including grants constitutes 7.3% in 2015; however, this target was achieved with an overall budget deficit of 7.1% of GDP (see Table 2.1). There is evidence of a downward trend in the budget deficit since 2012, when it registered a highest record of 12.2%.

According to IMF, for a country to make significant improvement in prudent fiscal managements, governments are to ensure to direct efforts that will increase the mobilization of their resource base. Total government revenue, comprising tax and non-tax revenues (excluding grants) as a percentage of GDP, increased from 21.1% to 22.0% while tax revenue accounted for 17 percent and 18.1 percent respectively. Meanwhile, total government expenditure, as a percentage of GDP decreased substantially from 30.8 percent in 2014 to 24.3 percent in 2015.

Table 2.1 gives the performance of some selected Government fiscal indicators as a percentage of Ghana's Gross Domestic Product from 2008 to 2015. Total tax revenue contributes significantly to government total income purse which accounts for 18.1 percent of the share of GDP in 2015. The tax performance from 2008 to 2015 is seen to be oscillating, increasing from 2009 to 2011 and then declined in 2012, after which the proportion increased in 2013, but declined in 2014. Total receipts as against total payments

showed deficits on the overall budget balance except for 2008 which recorded a surplus of about 7 percent.

Table 2.1: Selected Government Fiscal indicators 2008- 2015 (% GDP)

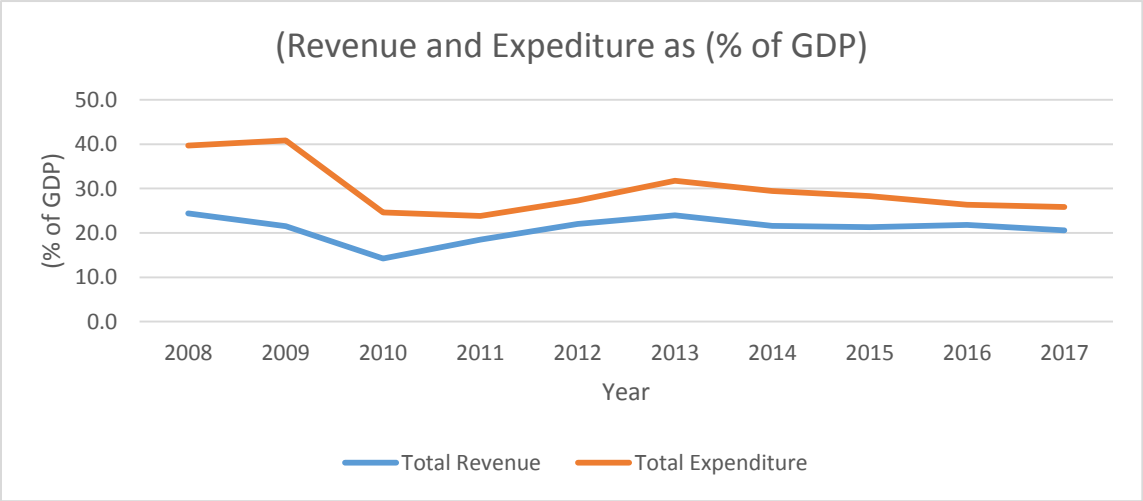
Indicator	2008	2009	2010	2011	2012	2013	2014	2015
Total Receipts	31.6	25.4	28.8	24.3	23.22	23.9	21.8	23.3
Total Revenue	15.9	15.5	16.8	20.8	21.6	22.4	21.1	22.0
Tax Revenue	14.3	12.7	13.7	17.4	17.2	17.4	17.0	18.1
Direct Taxes	4.2	4.7	5.3	7.2	7.7	6.7	7.5	6.5
Indirect Taxes	5.1	4.4	4.3	5.5	4.9	5.2	5.7	7.5
International Trade Taxes	2.4	2.1	2.5	2.7	2.8	3.4	3.8	4.1
Non-Tax Revenue	1.4	2.4	2.7	3.2	4.0	4.6	4.0	3.7
Grants	2.7	3.0	2.4	2.1	1.6	0.2	0.7	1.3
Other Receipts	11.5	6.9	8.6	5.4	12.2	0	***	
Divestiture	3.3	0	0	0	0	0	0	0
Project Loans	1.7	3.0	3.1	1.2	2.3	2.8	3.6	3.1
Progrmme Loans	0.5	0.9	0.6	0.4	0.3	0	0	0.6
Exceptional Financing	0.3	0.2	0.2	0.2	0.1	0	***	
Net Domestic Financing	5.3	2.9	4.7	3.5	9.6	7.6	5.4	2.6
Total Payments	31.6	25.4	28.8	24.3	32.9	23.6	28.2	28.0
Statutory Payments	7.8	6.7	7.6	7.9	7.1	8.8	***	
Discretionary payments	23.8	18.7	21.2	16.4	25.8	21.3	***	
overall Budget Balance	6.6	-5.6	-6.5	-4.3	-12.2	-10.1	-10.2	-7.1
Primary Budget Balance	-5.9	0.3	0.1	2.9	-2.2	-0.7	2.3	-0.3

Source ISSER, 2015: MoF, 2015,2016

Trends of Revenue and Expenditure

Revenue mobilization is critical and has been high on Ghana' agenda in recent times. This is because government rely on revenue generated mainly through taxation to finance its public expenditures and provide social services for its populace necessary for growth and development. Given that the government has to spend on other sectors of the economy, to reduce the poverty in the country, the government should direct efforts to bridge the revenue- expenditure gap, which is mostly financed by foreign aid that is not forthcoming. The option at the disposal of the government is to raise more revenue internally and/or educed its deficits. The fiscal trend in figure 2.2 shows that Ghana's revenue as a share of GDP has consistently been below the public expenditures. Thus tax -revenue raised are spent on recurrent expenditures such as government wage bills, statutory payments at the expense of capital expenditure (infrastructure) which is necessary for sustainable growth.

Figure 2.3: Trends of Revenue and Expenditure (% of GDP)



Source: MoF Fiscal Data

2.7 Overview of the ICT and the Telecommunication Sector

Information, Communication and Information sector plays a significant role in the development of every nation. According to the Africa Market Output Report (2015), Ghana has one of the fastest growing telecom industries in Africa, being ranked among the top 5 in the Sub-Saharan region with respect to market size and potential for further growth. Consequently, support services provided by telecommunication service providers and distributors (retailers and wholesalers) have also increased as the demand for their services keep growing. The broadcasting industry is also growing rapidly as seen by the increase in radio and television stations. This heightened activity of the sector is expanding the national economy, attracting investment into the country, providing job opportunities and enhancing productivity (NCA, 2017).

With the growing number of players in this industry, previous estimations of the contribution of the telecommunication and broadcasting industry to GDP do not seem to provide an accurate picture as the industry has grown significantly over the last 8 years. As such it has become necessary for the National Communications Authority (NCA) to procure consulting services to conduct a more extensive analysis of the contribution of the industry to GDP.

Since the liberalization of the communications industry in Ghana during the early 1990s, the industry has seen tremendous growth and has become competitive with the six (6) licensed international mobile telecommunications (telecoms) service providers, 3 fixed telephone companies (with 2 in operation), 3 tower companies, 10 domestic fibre optic companies, 5 international submarine cables, 4 broadband wireless access providers (with 3 in operation),

over 30 internet and data service providers and more than 400 broadcasting entities (radio and TV) as at the end of 2015 (NCA, 2017; OECD, 2012).

The telecommunication sector is defined to include radio, television, fixed and mobile telephones, and the Internet. According to World Bank statistics, Telecommunications is the main economic sector of Ghana due to the Ghana liberal policy around Information and communications technology (ICT). Among the main sectors of investments, ICT contributes 65 percent, while 8 percent is recorded for communications and 27 percent is attributed to public administration Studies have shown that the benefit of the telecommunication sector is obvious, yet very little knowledge and attention is devoted to this sector. Though a catalyst to fuel growth in other sectors, inadequate revenue is mobilized partly because the sector is more capital intensive and some developing countries devote less investment into the sector. However the Economic and social benefit of the sector is very enormous.

There is growing and wide-spread recognition that telecommunication is an essential catalyst for growth. Yet improved telecommunication generally has not been a central investment focus for developing countries. Developing countries usually invest less than 1% of their investment on telecommunications, compared to 2% in industrialized countries. The reasons for underinvestment are not necessarily due to lack of profitability of the telecommunication entities, which indeed make a healthy profit and contribute to the state purse. The major explanation for underinvestment is control and ownership.

Studies have shown that tax trigger on the telecommunication sector commenced since the inception of the service tax, way back in 1994. While the telecom sector has been a major contributor in indirect tax.

Southwood (2006) argues that mobile operators have not reached the bottom of the price elasticity curve, and are in a dilemma as to whether they can raise more revenue from lower rates (with increased usage) or whether they can devise a way of lowering their rates for particular groups of people (market discrimination). Southwood (2006) (argues further that most African markets have more mobile telephone companies; however, there is usually only a small percentage difference in price between the cheapest and the most expensive. Most of the operators have chosen the option of lowering on-net call charges for the benefit of their subscribers. The development is to enable subscribers to communicate cheaply with friends and relations in a particular network. In effect, the high subscription levels achieved in mobile telephone markets could be largely due to multiple subscription, and therefore do not give a true picture of mobile subscription in the country.

Revenue generation depends on the tax base and the tax rate as Musgrave postulate. The bigger the tax base the larger the revenue generated. On equity and efficiency grounds such taxes should be progressive for direct taxes (incomes) and regressive for indirect taxes such as VAT) To broaden the tax base for government to generate more revenue, there is the need to carry this study to provide policy makers information to ascertain which of the tax components to widen the tax base as well as implement policies that could shape the

telecommunication infrastructure and service providers to harness more revenue for the development of other sectors of the economy.

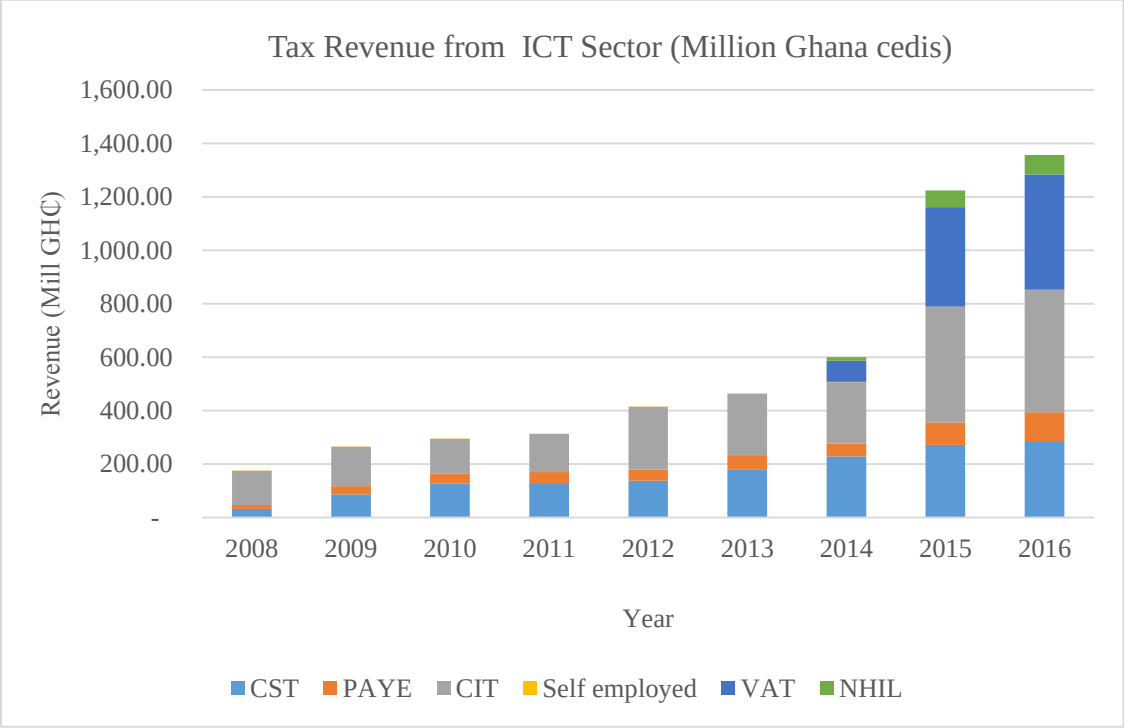
In the year 2010, while all the mobile operators were accounted for, information on less than 20% of the 196 radio stations was made available for inclusion in the computation of the sector's contribution to GDP as estimated by GSS. Furthermore, most of the internet and data service providers were also not part of the contribution of the sector to GDP. The GSS estimates that on average, the contribution of the communications sector to GDP is between 1.3% and 2.6%.

With the growth and income generation of this sector, it has become necessary to review existing contribution estimates of the sector to GDP. In addition, it is important to study the overall contribution of the ICT sector to the Ghanaian economy in terms of how it has contributed to government's revenue generation, investment, trade and employment.

ICT is a very broad area, as there is not one agreed definition; the exact confines of ICT are either narrowed or broadened depending on the task at hand. ICT can be defined as comprising of the telecommunication industry, broadcasting industry and support services providers, while adopting the fourth revision of the International Standard Industrial Classification (ISIC) for the identification of establishments (OECD, 2009). While the ICT industry is a prolific industry, it is still being developed in Ghana with some aspects of ICT barely developed. Currently, the major sub-sector of the industry in Ghana is the telecommunications sub-sector.

As noted earlier, the ICT sector in Ghana encompasses the telecommunication industry, the broadcasting industry and the support service providers. While the telecommunication and broadcasting sub-sectors account for a larger percentage of the sector with respect to visibility and coverage, the support service base keeps increasing with a growing inventory of ICT related activities. Software developers and retailers branching into e-commerce under the relatively new mobile money platform is an example of the expanding group of support services.

Figure 2.4: Tax Revenue from the ICT Sector



Source: Ghana Revenue Authority

According to Mastrini and Aguerre (2009), policies with clear cut implementation are essential to create conducive environment for stability, predictability and fair competition at all levels, allowing for universal service and other obligations to be met. This points to the importance of relevant policies for the stimulation of growth in the industry.

In Ghana, the two major policies that are driving ICT developments are the ICT for Accelerated Development (ICT4AD) Policy and National Telecom Policy (NTP). The ICT4AD Policy, supported by the United Nations (UN), aims to support an ICT-led socio-economic development process aimed at transforming Ghana into a middle income, information-rich and knowledge-based society. The development of this policy framework was based on a nation-wide consultative process involving key stakeholders in the public sector, private sector and civil society. The policy takes into account key socio-economic development framework documents such as the Ghana Poverty Reduction Strategy (GPRS), Vision 2020 and the Co-ordinated Program for Economic and Social Development of Ghana.

The importance of telecommunication in a country cannot be underestimated. Telecommunication promotes economic growth as well as socio-economic development of the sectors of an economy. India's telecommunication market has shown a phenomenal growth to the Indian economy in terms of domestic demand for telecommunication services. An initiative which was taken up by the government and subsequently made India emerged as one of the best telecommunication destination across the globe. The out-performance of the telecommunication industry has been as a result of some factors that include regulation,

liberalization and structural reform. This has attracted important investment for the industry for the past two decades.

The emergence of the mobile has benefitted people across all walks of life. Consequently, it is expected to play a significant role in bridging the digital divide between the rich and poor, between urban and rural, thus in connecting the nation. It has not only become the primary communication medium for people, but is also finding numerous uses across various domains. The benefit derived from the telecommunication industry are enormous. The integration of the telecom industries have had tremendous impacts on almost all economies. This include efficiency in doing business, automation in the banking sector, mobile money payments, improve education and health among others. Hence enhancing the social welfare of the citizenry.

During 21st century to move post-industrial, information based economic growth, countries and sector try to themselves with the necessary telecommunication system. A modern telecommunication infrastructure is not only important for economic growth but also to connect market of commodities as well as credit with international commodity and markets. This would develop the smooth flow of foreign investment, positive value exports, increase the value addition in GDP of an economy etc. Once the industrial and agriculture development was considered to be a best enhance economic growth of a country, every country gave more importance to sectors in its plans and policies, but now the trend has changed because the advancement and development of these two major sector of an economy

sustain on the development other factors, the role of service sector, advancement in technology, and the contribution of foreign sector in economic growth by different ways increases, and the major interest for foreign sector or investment was service sector and still thrives.

Ghana's mobile telecommunication industry is noted to be one of the fastest growing sectors of the Ghanaian economy and there is fierce competition within this sector made up of six telecom operators namely, MTN, TIGO, Vodafone, Airtel, Expresso and Glo. Despite the high number of Mobile Telecommunication service providers in Ghana Most government have become aware of the potential of the information and communication sector in stimulating growth in education, health, trade, investments, financial intermediation to mention but a few, are very paramount in national developmental progress. Research into such area is therefore needful to generate information to the decision-makers and national planners responsible for communications, information access and dissemination in other sectors has been on –going.

However other works by Wellenius (1984) opines that telecommunications should be made an intrinsic part of the developmental effort. The objective of his work was to assemble the currently available evidence to assist decision makers to assess the effects of a nation's investment in telecommunications on economic development and social and cultural well-being of the population. Given the prominence in socio-economic development it is worth to

analyze the subsector's contribution to revenue generation after the global liberalization of ICT and ascertain its capacity in contributing to the share of overall revenue generation.

2.8 The Tax System in Ghana

Taxation is therefore the main means of raising revenue for the government, though other forms of mobilizing revenue is through non-tax revenue, grants and loans that is minimal. Taxation is refers to the compulsory, unreciprocated payments made by individuals businesses or institutions to government. This underscores that taxation is compulsory and legal. Taxes in Ghana are therefore classified as four main components, namely taxes on income and property, taxes on domestic goods and services, international trade taxes and value Added Taxes (VAT). The latter was the last one that became operational, introduced in 1995, but withdrawn and re-introduced in 1998. Before VAT became operational, taxes on international trade were the major components of revenue, followed by taxes on domestic goods and services and then income and property taxes in Ghana. Total tax revenue increased for the recent years, from GH₵14,307 million in 2013 to GH₵19,229.8 million in 2014 and to GH₵24,144 million in 2015. As a proportion of GDP, tax revenue increased marginally from 17.2 percent in 2014 to 17.3 percent in 2015. The share of international trade taxes (in terms of total tax revenue) increased from 17.6 percent in 2014 to 18.8 percent in 2015. The share of taxes on goods and services, which had been on decline since 2003 changed the course and increased from 3.1 percent in 2014 to 8.2 percent in 2015 (ISSER, 2015).

Prior to the introduction of Economic recovery and structural adjustment programmes of International Monetary Fund (IMF) initiative by World Bank in 1983, the country

experienced economic crisis. This was seen in the widening of the expenditure-revenue gap. Deficits financing became the principal budget support causing the share of government borrowing from both domestic mainly (Central Bank) and international sources. The former source increase from 49 percent to 86 percent, while the latter increased the country's Debt to GDP ratio (Kusi, 1991).

In 2001, the government of Ghana opted for highly indebted Poor countries initiative of the World Bank and the IMF due to rapid exchange rate depreciation, high inflation and very low external reserves. This severe economic crisis was partly attributed to the high debt service requirement that affected the budget and consequently affected the balance of payment negatively.

The Ghana Revenue Authority is the current tax administration agency responsible for the collection of direct and consumer-based taxes internally in accordance with GRA Act 2009 (Act 791). Prior to this, there was a need to upgrade and modernize tax and customs administration in National tax revenue collection for 2014.

Taxation relates to growth of the economy and development in diverse ways. The rate of economic growth can be influenced by policy through the impact that taxation has upon economic decisions. This is because an increase in taxation reduces the returns to investment. Lower returns imply less accumulation and innovation and thereafter lower rate of growth.

Taxation promotes transfer of available resources from the private to public sector. It also allows government to establish enabling environment for the private enterprises. Resources

raised through taxation are used in construction of roads, improving the security system, and providing health and educational facilities among others. Sound administration of the tax system and public spending policies can also promote economic efficiency and equity.

2.9 Taxes Paid by ICT and Telecommunications Sector

2.9.1 Indirect Taxes

This is a tax levied on consumption goods and services which are finally paid by the consumer of those goods and services. The major indirect taxes that are administered in Ghana are the Value-Added Tax (VAT) and Custom and Excise duties. VAT is a broad-based sales tax levied on consumers when they buy locally produced or imposed on goods and services. It is applicable to value added to goods and services at each stage of production and distribution chains and forms part of the final prices consumers pay for goods and services. VAT is solely collected by registered companies and businesses that have authority to charge the tax. The businesses intend accounts to Domestic Tax Revenue Division of the GRA at the end of each month. The standard VAT chargeable is 15% which was increased from 12.5% in December 2013. By law, all registered persons are required to pay to the required VAT charge and National Health Insurance Levy (NHIL) simultaneously at the rate of 15% and 2% respectively of the taxable value of their supplies. Thus, in effect the total amounts to 17.5% of taxable value of supply.

2.10 Tax Types in the Telecom Sub-sector

The Telecom sector is the largest in the Information and Communication sector, which form about 70 percent of its share (NCA, 2006). Taxes payable by the Telecom sector include

corporate income Tax, (CIT), Communication Services Tax (CST), Value Added Tax (VAT), National Health Insurance Levy (NHIL) and Pay-As-You-Earn (PAYE).

2.10.1 Communication Services Tax (CST)

CST is a tax levied or charges for the use of communication services that are provided by communication services operators. The operators provide free-on-air services, pay-per-view television services, internet service providers, providers of radio broadcasting services, national fixed network operators, mobile cellular network operators and also public and corporate data operators. The tax is paid by consumers to communication service providers who intend pay all CST collected on a monthly basis to the domestic tax revenue Division of the Ghana Revenue Authority (GRA), The National Fiscal Stabilization Levy (NFSL) is imposed on the profit before tax. Certain selected companies and institution liable to pay the NFSL are banks (excluding rural and community banks), non-bank financial institutions, and insurance companies, Telecommunication companies liable to collect and pay the CST under the CST Act 2008 (ACT 754). In an attempt to ensure fiscal stability and sustainability, the government introduced the NFSL Act, 2009 (785) on the second half of 2009 to raise funds for national development. The Act was repealed in 2011 due to favorable fiscal stability. The levy was however, re-imposed following budget over-runs in many sectors of the economy including the implementation of Single Spine Salary structure (SSSS). Hence in 2013 a NFSL tax rate of 5 percent on profits before tax of the companies and institutions listed above was effected in September, 2013 that is payable quarterly.

To raise more revenue, tax reforms in recent times was undertaken notable among them is the Communication Services Tax (CST) (ACT 754, 2008). CST was introduced which led to the

removal of import duties, VAT and NHIL on importation and sale of telephone sets as mobile and satellite phones. This has led the effect of reducing the cost of telephones and lessens the introduction of tax burden that may result from the introduction of the CST. Thus accuracy in revenue projection is vital for devising an appropriate framework for sustainable fiscal management, and this can be realized if reforms are undertaken on existing tax policies in order to achieve some improvement.

2.10.2 Corporate Income Tax

Corporate income tax is a tax levied on profits of all companies and it is calculated after catering for interest and all allowances such as capital allowances but before the distribution of dividends accrued (Bannock et al, 1998). Most governments realize the impact of ICT/Telecommunication on economic growth and development and as a result treats the telecom sector companies more favorably than other sectors. The intention for such initiative is to attract more investment into the sector. For instance, investment in telecom infrastructure such as satellite require a huge capital outlay, hence to attract investors, the tax system applied must be more favorable (Otto, 2000). As a result many countries including Ghana, as undertaken policies that gives tax incentives to potential investors into the sector and realize the goal of achieving ICT for all.

According to Sarma and Naresh (2000) corporate income tax is made up of basic structure of the company, depreciation tax, supplementary levies, tax incentives and withholding provisions. Corporate income tax rates ranges from 25 percent to 35 percent in several countries. The required rate payable by the telecom sub-sector is 25 percent which is payable to the large Tax-payer unit of the Ghana Revenue Authority

2.10.3 National Health insurance levy

The National Health insurance levy (NHIL) is imposed on the profit - before tax of the service operators, which is at the rate of 2.5 percent. The telecommunication companies among some selected companies (Banks; excluding rural and community banks, Insurance companies) and institution are liable to collect and pay the CST and the levy, in accordance to CST Act 2008 (754). In order to ensure fiscal stability, the government introduced the national Fiscal Stabilization Act, 2009 (Act 785) on the second half of 2009 to raise additional funds for national development. In 2011, the Act was repealed due to favorable fiscal stability. The levy was however, re-imposed following budget over-runs in many sectors of the economy including the implementation of single-Spine Salary structure (SSSS). Hence in 2013 the NFSL tax rates of 5% on profit before tax of the aforementioned institutions were affected. The NFSL is payable on quarterly basis.

2.10.4 Value Added Tax

The major classic indirect tax administered in the Ghanaian economy is the Value Added tax (VAT) and Custom and excise duties. VAT is a broad-based sales tax levied on consumers when they buy locally produced or imposed on goods and services. It is applicable value added on goods and services at each stage of production and distribution chains, which forms part of the final price consumers pay for such goods and services. VAT is collected by registered companies and businesses that have the authority to charge the tax, the business then account to the domestic Tax Revenue Division (DTRD) of Ghana Revenue Authority at

the end of each month. The Telecommunication subsector also pays the standard VAT chargeable rate of 12.5 percent, which was 15 percent before 2013. Providers of communication services are required to pay the required tax rate and the National insurance levy simultaneously at the rate of15 % and 2.5% respectively of the taxable value of their supply. This in effect amounts to 17.5% of taxable value of supply.

2.11 Revenue Performance

The Information, communication and Technology/ Telecom sector contributes to government revenue through payment of both direct taxes and indirect taxes. The former, constitutes taxes such as corporate taxes on wages and salaries of employees and dividends, while the latter comprises of communication Services Tax (CST), Value Added Tax (VAT) and Withholding Tax. The share of ICT in total collection from the Ghana Revenue Authority (GRA) increased from 7.8% 2000 to 15.2% in 2010. On average the ICT has accounted for about 13.2% of the total GRA collection between 2000 to date.

In Ghana, direct taxes which is mainly administered by the Ghana Revenue Authority forms between 32, 2% of total tax revenue. Data on the contribution of the sector to government revenue in the 1990s is scanty following the integration of the other collection agencies: VAT service and Internal Revenue Service into one autonomous collection department to oversee all tax payments in the country. The National Communication Authority (NCA), who regulates the activities of the sector, however conducted a satellite accounts survey to

ascertain the contribution of the ICT sector to GDP in order to compliment the Ghana Statistical Service in updating the sector contribution which hitherto was under-estimated. As part of the survey a small component of the contribution of Telecom to government revenue was estimated Total domestic revenue contributed by the Telecos only was GH¢23.93 trillion in 2014 which increased to GH¢29.31 trillion in 2015. Statistics from GRA indicates that the ICT sector contributes significantly to direct taxes in terms of corporate tax, income tax and indirect tax in the form of CST and VAT. The share of ICT/ in total GRA collection increased from 13.2% in 2010 to 15.3% in 2016. Thus on average the sector accounted for 14.2 percent of total GRA collection in the 2000s.

Table 2.2 Estimated Taxes and Fees Contributed by Telecos (In Thousands GH₵)

Tax Type	2010	2011	2012	2013	2014	2015
Corporate Tax	86,620.00	234,240.02	215,630.01	85,285.20	165,831.67	195,633.00
NFSL	18,886.00	36,952.00	'	11,997.00	25,441.26	31,433.00
CST	137,339.90	135,044.35	128,376.33	173,978.92	216,600.50	251,848.42
Regulatory fees	30,175.79	43,910.43	46,910.43	55,561.32	86,783.06	57,795.00
Total Tax Paid	273,000.19	450,146.81	390,020.03	326,422.44	494,656.49	536,709.42
Total Domestic Revenue		**9,281,940.31**	**15,508,092.30**	**18,732,110.22**	**23,931,320.00**	**29,351,650.00**
Share of Telecos	4	5	25	2	2	18

Source: GRA and NCA

The Telecom companies contributed 3.6 percent of total government purse (domestic revenue excluding grants in 2010. The share however increased significantly to 4.8 percent in 2011 but recorded a decline in subsequent years, recording as low as 1.7 percent in 2013. Its contribution to domestic revenue increased in 2014 but declined in 2015 as shown in the table. This decline in revenue may be attributed to inability of the collecting agents in

assessing the right amount to be paid by the telecom since their operations are complex, hence there is a need for tax experts trained in that field to properly audit and assess the actual amount payable to maximize CST proceeds. It is worth to note that out of the six registered telecom companies only one pays corporate income tax, all these might account for low revenue yield though available statistics show that the sector is performing credibly well in revenue productivity.

Table 2. 3 Contribution of Services subsectors to tax revenue in Ghana (2010- 2016)

(in Million Ghana Cedis)

Services subsector/ Year	2010	2011	2012	2013	2014	2015	2016
Wholesale & Retail	206.66	263.11	417.05	339.08	928.93	1,171.88	1,596.51
Hotel & Restaurant	14.05	18.59	20.95	35.62	275.64	624.97	631.25
Transport	26.17	59.40	106.28	136.10	88.13	183.67	180.30
Storage	101.77	98.39	77.69	81.98	371.17	951.70	998.79
Communication	168.13	183.52	277.75	286.16	1,020.18	1,611.64	1,831.67
Financial Intermediation	317.18	532.97	658.58	678.04	82.24	131.78	120.96
Real Estate & Renting Activities	25.09	35.30	40.33	108.64	201.72	392.35	485.44
Computer, Research & Development	16.16	19.94	17.91	25.77	59.01	58.38	55.59
Other Professional & Bus. Activities	79.47	127.59	119.01	171.99	1,218.40	1,372.05	1,443.72
Public Administration & Defence	375.73	505.79	1,191.14	1,058.89	116.45	182.42	217.82
Education	59.59	68.64	104.73	95.77	45.73	68.08	79.36
Health & Social Work	18.80	25.77	30.30	35.07	11.30	10.26	14.86
Other Social & Personal Service Activities	76.52	74.57	81.99	80.95	219.98	420.38	421.50
Private Household Employment	1.52	0.45	0.62	1.81	1.53	9.21	0.24
Extra-Territorial Org. & Bodies	8.50	9.77	9.98	10.15	8.53	15.43	11.75
Total	**1,495.34**	**2,023.79**	**3,154.29**	**3,146.03**	**4,648.91**	**7,204.20**	**8,089.76**

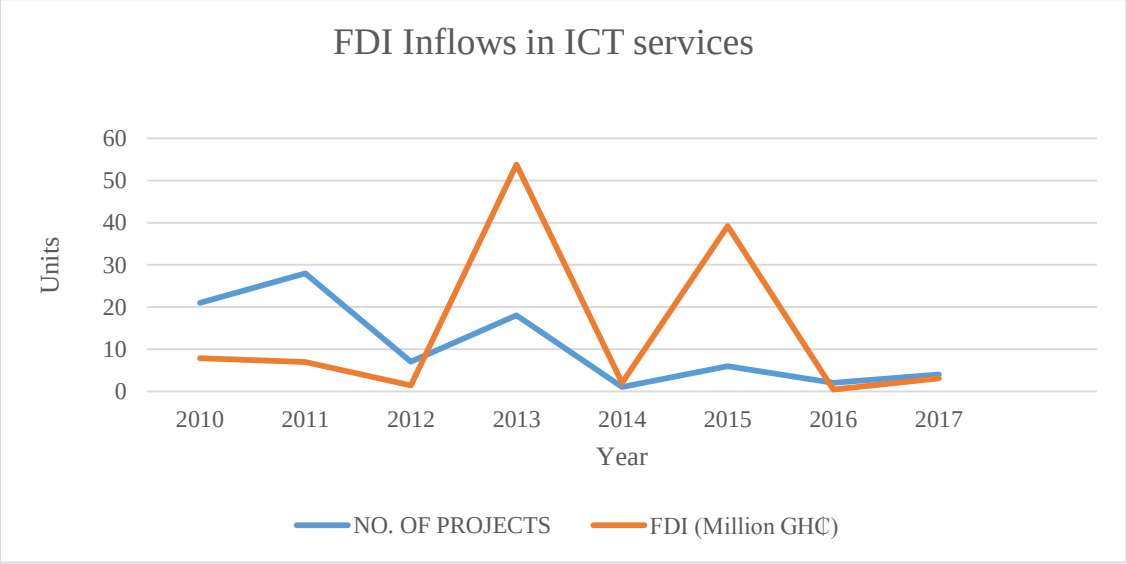
Source: Authors own computation from GRA tax collections

2.12 ICT/Telecom Sector Fiscal Regimes

As part of government policy to create conducive environment for the private sector, in lieu of increasing investments and reducing over- all tax burden of businesses in the ICT sector

tax incentives are designed. They are so designed to enable easy access of information and communication which is necessary for ease of transacting business, improving the performance of other sectors of the economy as well as improving the well-being of the citizenry. Such incentives, according to, Unni et al (2011) are provided with the purpose of attracting investment to rural and deprived sections of the country, enhance the performance of the sector and lead to overall maximization of government revenue and other economic benefits such as employment or to enhance technology transfer, which are necessary for development and economic growth. Tax incentives to the ICT sector is defined by The ICT/Telecommunication Act, 2006 (Act 704) and internal Revenue Act, 2000 (Act 592). The incentives include the following:

Figure 2.5: Trends of inflows in ICT services



Source: Ghana Investment Promotion Center

Ghana is among a host of countries that is characterized with challenges in mobilizing adequate resources which is necessary to finance the provision of social services for its

citizenry necessary for human development. Macroeconomic stability through prudent fiscal policies has been an agenda for governments to ensure economic growth. With the global financial system that confront African countries in accessing external resources to meet its developmental goals, Ghana would have to increase its efforts by focusing more on raising domestic resources to achieve its set target.

CHAPTER THREE

LITERATURE REVIEW

This chapter reviews the theoretical, conceptual and empirical literature on the services sector and revenue generation in relation to Economic growth. The section also looks at the theory of optimal taxation and defines buoyancy and elasticity of Communication services tax to GDP. The empirical literature looks at different studies on Services sector and the ICT subsector as well as lessons learnt from empirical studies are discussed.

3.1 Theoretical literature Review

3.1.1 The three sector Hypothesis

The three sector hypothesis opine division of the economy into three main sectors of activity, The first activity involves the extraction of raw materials (primary), the second, manufacturing (secondary), and the third services (tertiary). The theory stipulates that, the main focus of an economic activity shifts from the primary, through the secondary, and finally the tertiary sector. This process is seen to be essentially positive in the wake of developments and technological advancement since the past two decades. The authors stipulate that increase in the quality of life, enhancement of social security, increase interest and expansion of ICT and telecommunication has led to increased ICT infrastructure and service providers of communication services. The theory opines that, this has subsequently led to blossoming of businesses, education and culture, higher levels of qualifications which has move the economy from an early stage of development. This theory, also underpinned that the main part of the national income is achieved through production in the primary

sector. Thus, the three sector hypothesis envisaged countries in a more advanced state of development, with a medium national income, generate their income mostly in the secondary sector whereas in highly developed countries, with a high income, the tertiary sector dominates the total output of the economy.

In addition, the sector theory argues that over time the relative share of production in each major sector will change in the region. Due to the income elasticity of demand for primary, secondary, and tertiary products, the region becomes specialized in primary, secondary, and tertiary products. The income elasticity of demand for the products of different sectors drives the sectorial shifts in production. Increases in labour productivity support the changing sectorial allocation of the labour force.

In addition, the theory has it that as per capita income increases, the demand for manufactured goods will exceed the demand for primary product. Consequently, the demand for services predominates and the service sector becomes the largest regional sector. Sector theory focuses on the internal structure of the economy. Internal development through specialization and division of labour paves the way for favourable external trading relationships. Thus, internal development leads to external development.

However, the sector theory is seen as too primitive to be used as a strategy for encouraging economic growth. Sectors must be examined at a finer level (Enu *et al*, 2015). To use sector theory more effectively, the service sector might be divided into five (5) categories: distribution, trade, business services, education and health services and other public non-profit and consumer services and also, knowing how and to what extent macroeconomic

policies influence services production through ICT sector is very necessary and sufficient for sustainable services sectorial growth and economic growth (OECD, 2005).

3.1.2 The Theory of Progression

The theory of progression states that as people's income increases, they begin to shift demand away from the consumption of agricultural produce and industrial produce to service produce. This means that as people's income increases in an economy, their demand for service product increases. In several economies, they tend to follow a developmental progression that moves them away from a heavy reliance on agriculture and mining, to the development of manufacturing for example textiles, shipbuilding, and steel and so on to a more service based economic structure (Enu et al., 2015), the same thought is shared as the theory of progression and explained that the movement of countries from a heavy reliance on agriculture to a more service-based structure might happen because as per capita income increases, agriculture loses its primacy, giving way first to a rise in the industrial sector and then to a rise in the service sector. Also, in reference to past events, the manufacturing seemed to be more open to international trade and competition than services; however in recent times, due to dramatic reduction of cost and speed; and reliability and improvement in the transportation of people and communication of information, the services sector now includes some of the most intense international competition

3.1.3 Theory on Stages of Growth

Rostow (1960), in his book, "The Stages of Economic Growth", identified five stages every economy pass through when it is growing. This include the traditional stage which is

dominated by subsistent agriculture; The transitional and take-off stages which are both associated to industrialization; Drive to maturity when technological progress is key; and then finally, the age of high mass consumption, dominated by the service sector. According to Rostow, this last stage is where all transitions stop and service provision and consumption becomes the drivers of growth in an economy. Although it is quite difficult to relate to all five stages of growth of Rostow's in the real world, it is not out of place to mention that most countries have gone through some of these stages; and more importantly most developed countries of the world are at the stage where the service sector is the main driver of growth--exactly what Rostow predicted during the age of mass consumption is exemplified not only in developed countries but also in less developed countries where primary and industrial production has shifted to the tertiary level (services sector).

3.1.4 The Structural Change Model

One of the notable theories on structural change has been propounded by Chenery (1979). According to the author, in a study of the developing countries during the post war periods, different countries experience common development patterns; these include the shift from traditional agricultural to industrial production, the steady accumulation of physical and human capital, changes in consumer demands from emphasis on food and basic necessities to desires for diverse manufactured goods and services. In addition, families replace child quantity with child quality (education) Chenery (1979) as quoted by Todaro and Smith (2009) and Enu et al. (2015).

3.2 Conceptual Review

3.2.1 Role of Taxation

Taxation has been defined by many researchers in several ways. According to (Anyanfo, 1996; Anyanwu, 1997; Appah and Oyandonghan, 2011; Appah, 2004), a tax is a compulsory levy imposed on a subject or on his property by the government to provide security, social amenities and create conditions for the economic well-being of the society. IMF also defines tax, as a compulsory unrequited payments made by individuals, households and firms to public resources of government for the provision of goods and services necessary for economic growth and development.

For taxes to play its critical role in an economy, Nzotta (2007) outlined four key issues that must be understood in taxation. Firstly, a tax is a compulsory contribution made by the citizens to the government for the common use of citizens. Secondly, a tax imposes a general obligation on the tax payers. Thirdly, there is a presumption that the contribution to public revenue made by the tax payer may not be equivalent to the benefits received. Fourthly, a tax is not imposed on a citizen by the government because it has rendered specific services to him or his family. Thus, the foregoing views on taxation imply that a good tax system plays a multiple role in the process of economic development. Such a tax system presents an opportunity for the government to collect additional revenue needed to discharge its obligations. Goode (1984) refers to taxes as compulsory payments from households and firms to governments and usually no '*quid pro quo'*. Taxes must possess certain desirable attributes which is collectively described as "cannons of taxation", a good tax system must therefore be economically efficient, convenient, certain and equitable. Smith (1776) asserts

that, a Tax policy should serve the attributes of a good tax system. Hence a tax policy is the choice by a government to levy her citizen, when it is to be levied, taking into consideration the growth of the economy. Tax policies from time to time have been implemented for a variety of reasons. The key objectives of taxation are: revenue generation for financing government spending capable of raising the growth rate, resource allocation, re-distribution of income and reducing inequalities arising from the distribution of wealth among consumers.

Romer and Romer (2010) also attest to the fact that tax policies are implemented either to: finance a budget deficit and counter other influences in the economy. The tax instrument becomes beneficial if it is designed to mobilize additional revenue and to afford the tax policy measures that will reflect the government desire to make taxation as a main policy instrument to accelerate economic growth. To these ends, reforms have encompassed outrights reliefs as well as incentives signals to households and business sectors (Kusi, 1998) Also, the tax policy measures suggest how to manage the tax system more especially the tax laws and information so that the households and businesses can make their savings, consumption as well as investment decisions in most efficient ways.

The role of taxation cannot be overemphasized, as a macroeconomic tool, it is used to serve multiple objectives; This includes among others mobilization of resources to finance government expenditures in the provision of health, education, infrastructure and other social services that are necessary for sustaining human welfare and development. Taxation promotes savings and investment inducing savings in a particular form to facilitate the

process of channeling savings into investment, directing investment into productive activities, fostering greater equity in the distribution of income and correcting externalities. In recent times however, there is a wide acceptance that despite the dual role of taxation, the tax system should focus on raising sufficient revenue, Notwithstanding, according to IMF, tax instrument should be designed to raise enough revenue to meet government revenue target at the same time should minimize the level of associated distortions (Mackanzie et al, 1997).

Karingi and Wanjala (2005) outlines three main objectives of tax systems, these are;

i. to raise revenue to fund government operations
ii. to assist in the redistribution of income or wealth, and
iii. to encourage certain activities through the use of tax provisions or incentives'

In addition to these, taxation can also be used as a stabilization tool, where various Instruments may be adopted or are adjusted depending on current economic situation of a country. The extent to which these objectives are met may vary from country to country

3.2.2 Revenue

The term revenue has been defined by several authors in different ways. Adam (2006) defined revenue as the funds required by the government to finance its activities. These funds are generated from different sources such as taxes, borrowing, fine, fees etc. Revenue is also defined as the total amount of income that accrues to an organization (public or private) within a specified period of time (Asnafi and Hamid, 2008). A country's revenue comprises of receipt from taxation as well as those which are not the proceeds of taxation, but of either the realization from the sale of government properties or other interests and returns from

loans and investment earning. Bhatia (2001) contends that revenue receipt include “routine” and “earned” income. For these reasons, according to him, revenue do not include borrowing and recovery of loans from other parties, but it includes tax receipts, donations, grants, fees and fines and so on.

Similarly, Pearce (1986) defined government revenue as all the money received other than from issue of, and debt, liquidation of investments. Government revenue includes tax collections, charges and miscellaneous revenues, utility and insurance trust revenue for all funds and agencies of a government. Public revenue focuses on various ways by which the government generates revenue.

From the above definitions, it can be said that revenue is the total amount of income accruing to a state from various sources within a specified period of time. State government, like the other two tiers of government, has sources and uses of revenue. Government revenue can be generated from two sources. These are internally generally generated revenue and revenue allocated from the consolidated account. Internally generated revenue are those revenues that are derived within the state from various sources such as taxes (pay as you earn, direct assessment, capital gain taxes), and motor vehicle license, among others. While the statutory allocation from Federation Account, Value Added Tax constitute the external source. Most states of the federation get the bulk of their revenue in form of statutory allocation from the consolidated account to finance their expenditure programmes. (Isyaku, 1997).

3.2.3 Tax Reforms

A host of governments have embarked on tax reforms with the aim of achieving many goals. This goals include reform processes aimed at eliminating the disincentive effects of the level of taxation: to reduce the economic inefficiencies induced by the distortionary assets and sectors, to protect the poorest of the poor from the tax net, to redistribute resources to promote fairness and equity as well as provide partial relief from the unwelcome effects of inflation. Thus enhancement in revenue productivity, economic efficiency, simplicity and horizontal equity issues have been a concern and dominated global agenda of prudent tax system.

Osoro (1993) has defined tax reform as a change in the status quo and that tax reforms has been one of the major focus of most developing countries in the 1980s. Consequently raising the productivity of the tax system is one of the most essential elements of tax reforms. As eminent in the principle of a good tax system, Mcmahan and Berrios (1991) argue that the analysis of tax reforms should focus on evaluating the objectives of those reforms including revenue adequacy, equity, simplicity and economic efficiency. A study by Stern (1996) reveals that, it will be constructive to shift taxation at the margin from tax_i to tax_j, if the marginal cost of tax_i exceed that of tax_j. The study asserts that a tax reform is beneficial, if it increases both revenue and social welfare. In relation to shadow prices, a tax should be increased if the direct impact on households of making the change exceeds the cost at shadow prices of extra demand of the commodity, the shadow price represent the welfare cost of general equilibrium adjustment flow from an additional demand for the commodity in question.

3.2.4 Principles of taxation

The basic principles that guide a tax policy are adequacy, equity, exportability simplicity and neutrality. A tax system is deemed adequate if it raises enough resources to pay for government services. Neutrality also refers to imposing a tax that does not distort economic decision made by economic agents. Exportability implies the extent to which taxes are paid for by non-residents. Simplicity, also refers to the tax collection and assessment system that does not impose costs greater than the revenue raised, and tax code should be easily understood by the tax payers. Equity principle revolves around a tax system that is fair and this is measured in two main ways namely horizontal and vertical equity.

Horizontal equity refers to where individuals or businesses with similar welfare characteristics have similar tax burdens; thus they are to be taxed equally. The challenge with this measure is the inability to objectively assess the levels of persons in this group. Vertical equity measure on the other hand, treats individuals and businesses with different welfare levels unequally. The issues of progressivity and progressivity in tax rates are underlying concepts under vertical equity. The limitation in this measure is the inability to treat people at different utility levels precisely to reflect their differences in their utilities because of the subjectivity of judgment

Progressivity in taxes treats lower- income persons or families to pay a greater percentage of their income in tax than upper- income ones. Sales tax which has been replaced with the Value Added Tax is a classic regressive tax instituted in Ghana. Progressive tax on the other hand, requires upper income persons or families to pay larger proportion of their income in taxes than lower- income persons or families. A classic example of a progressive tax is income tax. Proportional tax also assesses tax payers equally and is therefore considered bad.

Progressive taxation hoovers around the ability to pay principle and the benefit principle. This connotes the idea that there should be some equivalence between what a person pays and the benefits one derives from public services. Thus, vertical equity is argued to be superior to horizontal equity; the two concepts therefore go hand in hand. Thirsk (1997) asserts that these principles of taxation are common and well known but the practice has deviated from the principle to a large extent and may vary across countries.

3.3 Taxation and Economic Growth

Taxation is related to growth of an economy and can act as development-driven in a number of ways. The rate of economic growth can be influenced by policy through the impact that taxation has upon economic decisions. Thus, a tax system is critical for economic growth. Growth is linked to population growth through positive net capital formation. The link between capital formation and output growth is obtained by calculating the incremental capital- output ratio. Taxation plays a number of roles, primarily promotes transfer of available resources from the private to public sector, thus, reducing the returns to investment. At the same time, reducing consumption, whilst increasing savings to raise the needed level of investment for accelerated economic growth.

Resources raised through taxation are used in the provision of public services, which includes construction of roads, improving the security system, and providing health and educational facilities among others. Sound administration of the tax system and public spending policies can also promote economic efficiency and equity through income redistribution; where higher income earners pay proportionally higher the lower income group and the government channeling resources to areas that are more needed or to the poorest of the poor. Establishing a relationship between taxation and gross domestic product is necessary for measuring

economic growth. Khan (1973) points out that effective tax policy is most important in mobilizing increases in public resources crucial for investments and meeting expenditure demands of a country.

Mtatifikolo (1990) points out that the actual tax collection capacity of a country depends on economic surpluses and the 'tax handles' at the disposal of the government, thus as the economy expands through higher level of development the built-in responsiveness of the tax system expand resulting to increase in tax revenue. The net effect is stimulating growth and improving the social and economic welfare of the populace.

3.4 Empirical Literature Review

The phenomenon of service sector growth and its effect on the economy is discussed in literature (Enu, Addey,, & Okonkwo,. (2015): Mujahid, & Alam, (2014)}. These empirical studies done have focused on varying methods and analytical tools, on the effects of service sector growth on economic growth , based on the objective of their studies, countries and continent origin..

Beginning from the pioneering work of Kuznets (1957) and Chenery (1960), evolution of sectorial shares in output, consumption and employment as economies grow have been studied for a long period. These studies attribute economic development as a three-stage process, wherein primary, secondary and services sector dominate the economic activity in that sequence. Analysis in terms of such stages of development, however, has been challenged in the recent literature, with the benefit of a richer data than was available to Chenery (1960).

Balachandran and Malini (2013), in their paper, titled 'Changed Role of Services sector and Enhanced Service tax revenue- An introspection' investigates the impact of services sector tax on internal revenue generation in India by using secondary data from various issues of Economic Surveys and Annual performance reports for the period 2000 to 2012.The study employed the use of descriptive design method. .

The analysis of data reveals that the service tax in India is progressing faster in terms of revenue growth, assessee base growth and even growth in service tax collection per assessee and per service. However, the service tax failed to meet the incredible growth of revenue generation from the service sector in such a manner to reduce the tax burden on manufacturing and international trade. Consequently, the study concludes that service tax is not contributing enough to the total tax basket of India. Hence, the government should implement policies that expand the broad based Goods and Services Tax (GST) uniformly in the coming financial year.

Enu, Addey, & Okonkwo, (2015) examines what drives growth in the services sector of Ghana to determine which of the sub-sectors is more potent. To achieve their objective, two models were specified which covered two period 1981-2013 and 1990-2009 respectively. The method of Ordinary Least Squares estimation technique was employed to determine the potency of the service sub-sectors (transport and communication, tourism, financial institutions, health and education) and also to determine the contributions and impact of some macroeconomic variables (labour force, capital, real gross domestic product, service export

and service import) on service output in Ghana. Their findings revealed that, the financial institutions are the sub-sector that drives service output in Ghana. Also labour force and real gross domestic product per capita were determined as the key macroeconomic variables that drive the service sector growth in Ghana.

Ahmed and Ahsan (2011) sought to analyze how the services sector has provided steady support to Pakistan's economic growth. Over a period of. The paper analyses its continuation in the growth of the economy in general and the development of trade and generation of employment in particular. The study identifies the bottlenecks in its growth and suggest measures to remove them. A set of policy reforms has been suggested to make the sector more effective in the growth of the national economy. The objective of this paper is to analyze the importance of services sector in an economy and better understanding about Pakistan services sector. The study also explores the relative performance of services sector and its contribution in the economic growth, trade and employment generation.

In terms of growth, Kongsamut *et a.l.,* (2001) estimates for 123 countries from 1970-80 that with increase in services raises the per capita GDP of these economies. These economies move from agriculture sector to more in services sector and less in industrial sector. Rath and Raj, (2006) analyses that higher growth in services sector leads to India's economic growth. They argue that service sector not only provides more job opportunities but also is widening the tax base and the buoyancy of taxes.

Mujahid and Alam (2014) in their paper titled 'Service Sector As An Engine Of Growth: Empirical Analysis Of Pakistan, examine the determinants of service sector growth such as external debt, population, gross domestic product per capita, foreign direct investment and government consumption and employed labour force in services. For this purpose the study employed co-integration technique and vector error correction model for investigating long run as well as short run relationship among variables respectively during the annual time period 1976- 2010. Their results proposed that there is significant effect of population, foreign direct investment, consumption and investment on service sector growth in Pakistan. Fuchs (1980). Kongsamut et al. (2001) also found the high contribution of services sector increase the GDP per capita with sample size of 123 countries with time duration 1970-80. Over the same period, Pakistan service sector contributed 54% to GDP, nearly one third of total Gross Domestic Product.

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Adenugba and Ogechi (2013) studied the effect of internal revenue generation on infrastructural development in Nigeria. They used survey research design and purposive sampling method to select respondents from Lagos State Inland Revenue Office. Using. Descriptive and inferential statistics as analytical tool, they employed Spearman's Rank correlation analysis to test the relationship between internally generated revenue and infrastructural development. The result showed that there is a positive relationship between internally generated revenue and infrastructural development. The study also revealed the various methods of generating internal revenue, which are the enforcement of tax personnel, contribution, and creating awareness to the public. The findings of the study however show

that revenue administration agencies need to be reviewed to generate more revenue in the country.

The theoretical and practical importance of taxation and revenue productivity in the tax system has attracted the attention of several researchers. These studies resulted in a series of research work in examining the effect of discretionary changes on revenue productivity.

Osoro (1993) also examined the revenue productivity implication of tax reforms in Tanzania for the period 1970 to 1989, the study revealed that the tax buoyancy was estimated using double log form equation and tax revenue elasticity by employing the proportional adjustment method. The statistical results gave an overall elasticity of 0.76 with a buoyancy of 1.06. The study therefore concluded that tax reforms in Tanzania had failed to raise additional tax revenues. The result was attributed to government granting many tax exemptions and also poor tax administration within the sample period.

In another study by Ariyo (1997), the productivity of the Nigerian tax system for the period 1970-1990 was examined. The aim of the study was to devise a reasonable sustainable revenue profile. In the study, tax buoyancy and tax revenue elasticity were estimated using the double log form and the proportional adjustment method respectively. The slope dummy equation was used to estimate the oil boom and structural adjustment programmes. The study revealed an overall satisfactory tax productivity capacity level but wide variations in the level of tax revenue by the various tax sources. The variation however, was attributable to the laxity in administration of non-oil tax sources during the oil boom periods. The study further indicated that there was the need to improve the tax information system to enhance the evaluation of its performance and thereby facilitate adequate macro-economic planning and implementation process.

Widmalm (2001) examines the growth effects of revenue- neutral changes in tax policy, based on accurate estimation of Nigeria's data provided by the OECD Tax Revenue Statistics covering 23 OECD countries from 1965 to 1990. The taxes were categorized into five, namely: corporate income taxes, labour and capital income taxes for individuals, property taxes, taxes on goods & services and taxes on payroll and social security contributions.

Employing the Extreme Bounds Analysis, Widmalm (2001) finds that there is a robust negative relationship between the share of taxes on personal income and the growth rate of per capita GDP. However, He finds that corporate income taxes as a share of total tax revenue have a positive nevertheless, a weaker relationship with growth. Similarly, the evidence is also fragile in correlation to taxes on: payrolls and social security contributions, goods and services and property. Including investment to GDP ratio, the estimation result suggests that the tax type may affect growth through channels other than physical capital accumulation for example human capital accumulation or supply of effort.

Scarlett (2011) uses autoregressive distributed-lag model to estimate the impact of tax policy on economic growth with a quarterly data in Jamaica. Also, a granger causality test is used to ascertain the directional correlation between the explanatory variables and growth of the economy. The results point out that increasing revenue from indirect taxes is more conducive to growth of the economy in the long run. Nevertheless, increasing the share of taxes from personal income precisely PAYE has the utmost detriment on GDP per capita over time. Therefore, correction to equilibrium needs a maximum of nine quarters from such an impact. Besides, an increase in tax revenue by policy makers on consumption tax would be favorable to economic growth in the short run. In an effort to stimulate demand, there is a need to reduce taxes on PAYE.

In examining the impact of government's tax policy measures, the tax policy variable is defined as the share of tax revenue which is raised from a given tax as proposed by Arnold *et al.*, (2011). The tax measure basically provides an indication of the level of taxation as well as the policy action of the fiscal authority. Nevertheless, one has to bear in mind that the tax policy will take into consideration the targeted tax group. In this regard, the tax component is grouped into four categories namely: personal income tax, value added tax, excise duty and import tax. It is essential to know that an increase in the share of tax revenue for one tax group will automatically reduce the amount of taxes needed to be generated from the other tax groups.

3.4.1 Optimal Taxation and Reform

The theory of optimal taxation has also been of concern to many researchers. The theory is seen to be analogous to the examination of the principles of taxation, where lump-sum taxes are impossible. The analysis of optimal commodity taxation begun with Ramsey (1927), but the subject expanded in the early 1970s, following the Diamond-Mirelees papers of 1971. The subject of optimal income taxation was created by Mirrlees (1971).

The general principles of optimal taxation can be summarized as follows;

1. Tax revenue is raised most efficiently by taxing goods and factors with inelastic demand or supply (this abstracts from distributional issues where inelasticity refers to compensated demands and supplies)

2. Taxation is concerned with the distribution and with externalities or market failures should as much as possible go to the root of the problem, In this regard, for distribution, one should look for the sources of inequality(for example, in terms of earned incomes or land endowments and thus should concentrate taxation there

One can therefore see that the theory of optimal taxation draw a sharp distinction between cases in which promotion of efficiency is desirable. This is so because the prospect of equity is not compromised and in cases that efficiency must be sacrificed in the pursuit of equity for the interest of the populace. For example trade taxes and taxes on intermediate good has the potential of introducing inefficiencies into production, that will not be desirable, unless they provide additional leverage over the distribution of welfare, which will not, unless that production is competitive and consumers can be taxed on their consumption. These efficiency results only require the promotion of social welfare to be an increasing function of the individual welfare. As a result, equity and efficiency must be balanced in the design of direct and indirect t taxes on consumers; the tax rate will also depend on the exact format of the social welfare function as postulated by Newberry (1988).

The optimal tax model developed for modern tax analysis appears to be quite inappropriate for most developing countries, this is because, firstly the model is perfectly competitive and, in the absence of distortion taxes, would yield an efficient equilibrium. The problem here is that government are very much concern with the issue of increasing their revenue productivity and improving the distribution of income but do not have enough information about the preferences and endowments of its citizens to do so by means of lump-sum taxes. If governments are even successful in eliminating market failures, that emanates from the production and in ensuring competitive behavior. And hence efficiency, they would be faced

with inevitable conflicts between equity and efficiency in allocating output among consumers.

A common feature of the tax structure in most developing countries is that of its complexity (difficulty in administering and complying with), inelasticity (non-responsiveness to growth and discretionary policy measures), inefficiency (raising little revenue and introducing serious economic distortion), in-equitability (treating individuals and businesses in similar situations differently) and unfair (in terms of tax administration and enforcement are selectively skewed in favor of those with the resources to defeat the system). There is a heavy reliance on international trade taxes, which underlines long-term international competiveness. User charges and taxes on income and property contribute only a small proportion of total revenue. Taxes on wealth, bequests, land and property exist in theory but have been rendered ineffective by design problems or lack of interest in administration, or both, while personal and corporate income taxes are levied on narrow bases at high rates. Sales taxes on the other hand, are levied in cascading manner thereby imposing tax pyramiding and some cases closely or more than 100 % full forward shifting as pointed out by Khalilzadeh-shirazi and Shah, 1995; Shalilzi and Squire, 1990).

Faced with series of mounting budget deficits, a number of developing countries having to cut expenditures as far as prudently possible, particularly on investment and spending, have undertaken to restructure their system of taxation to enable the achieve higher revenue or improve the revenue elasticity and buoyancy of their tax system. Other goals of these reforms processes are geared towards eliminating the disincentive effects of the levels of taxation to reduce the economic inefficiencies induced by the discretionary taxation of assets and sectors; to protect the poorest of the poor from the tax net, and thus provide partial relief

from the unwelcome effects of inflation (Khalilzadeh-Shirazi and Shah, 1995). Consequently revenue enhancement, economic efficiency, horizontal efficiency and simplicity issues have dominated the global agenda on tax reforms.

In pursuance of revenue enhancement, many countries are relying less on narrowly based trade taxes and emphasizing on consumption taxes. In order to reduce disincentive effects of taxation, some countries have brought down the average and marginal effective tax rates by eliminating the inefficiencies that arises from tax preferences and thereby broadening the bases, at the same time leveling the rates. These measures however, compromise with vertical equity. Broadening the bases may raise the threshold of taxation and have the effect of fewer and lower tax rates, but it does not pay adequate attention to the distribution effect of relative tax burden across income groups. Notwithstanding, some countries have attempted to protect the poor by exempting or zero rating foods under value added tax (VAT) while raising the threshold of taxes on personal income, urban property and agricultural land among others.

Vertical equity is increasingly seen as an elusive goal and as a result, assigned a lower order of priority in tax reform. All recent attempts on tax reforms have shelved tax preferences, especially in the area in the area of investment, however, some economist have argued that certain tax incentives such as investment tax credit are deemed to be desirable and should be promoted since they lower the user cost of (new) capital, thereby encouraging greater capital formation.

3.4.2 Review of tax Revenue Adjustment Methods

The measurement of elasticity of a tax system involves the elimination of that part growth of tax revenue accounted for by discretionary changes from tax revenue series. Various studies on revenue productivity use different methods in adjusting revenue data depending on the availability of information as well as the nature of discretionary changes. The major techniques used include Proportional Adjustment methods (see Kusi, 1998). Constant rate structure as used by Choudhry (1975), Tanzi (1976) and the divisia index as used by Choudhry (1979).

Proportional adjustment method involves subtracting budget estimates of tax yields owing to discretionary changes from actual yield. This is multiplied by a sequence of multiplicative factors that further refines the adjusted revenue data. This technique has an advantage because of the limitation of other methods.

The divisia index approach however, involves the use of the divisia index. This technique is expected to provide a reasonable measure of the effects of discretionary changes especially when information on revenue effects of discretionary changes is not available. This method however, makes use of time trends as proxies for discretionary measures which is questionable, this approach therefore leads to over or under-estimation depending on whether discretionary changes produce positive or negative income effect. Divisia index when employed does not allow for the estimation of elasticities of tax revenue components because, it assumes that each base represents its own tax category as pointed out by Choudhry (1979)

The dummy variable technique involves introducing a dummy variable for each exogenous variable that influences revenue generation significantly. This method however, is not appropriate when discretionary changes have been made more frequently in the past. The constant rate structure approach is very simple, which involves multiplying tax brackets rates or effective tax rates of a reference year by its corresponding base values. The disadvantage of using this method is that the elasticities of individual taxes and the overall tax system estimated by using this method as an adjustment technique depends on the variation of the bases with respect to output or GDP.

Ayoki *et al,* (2005) examined tax reforms and domestic revenue mobilization in Uganda by employing the proportional adjustment method. Their findings indicated that reforms had a positive impact on direct taxes as tax-to-income elasticity index grew fromn0.706 to 2.082 after the implementation of the reforms whilst direct taxes also moved from 1.037 to 1.036. They therefore concluded that the reform was necessary to the economy in yielding revenue productivity but suggested that there was room for more improvement.

In a study by Sulman and Hassan (2005), the author used the dummy variable method to look at the impact of trade liberalization on revenue mobilization and stability in income. The results revealed that the tax system as a whole was not buoyant or elastic with an index of 0.82 whilst the elasticities of the individual taxes were divergent with the following indexes: import duty was 0.83, excise tax 0.82, income tax recorded 1.26 and profit tax was 1.57. The conclusion of the study was that the system was less buoyant and elastic, this accounts for an explanation for the low tax efforts and relatively low and declining government spending.

In Ghana, a study by Kusi (1998) studied tax reforms and revenue productivity of Ghana for the period 1970 to 1993. Results of the study showed that a pre-reform buoyancy of 0.72 and elasticity of 0.71 for the period 1970 to 1982. The period after reform, 1983 to 1993, showed increased buoyancy of 1.29 and elasticity of 1.22. The low buoyancy and elasticity during the pre-reform period was attributed to unrecorded trade, smuggling tax evasion and laxity in the tax collection. The results also indicated that income tax had the lowest elasticity and so recommended that authorities showed move away from income-based taxes in favour of consumption tax. The study finally concluded that reforms had contributed significantly to tax revenue productivity within the period 1983 to 1993.

A study by Brafu-Insaidoo and Obeng (2008) examined the effect of import liberalization on Tariff revenue in Ghana for the period 1966 to 2003.The study adopted the Singer (1968) approach to estimate the buoyancy and elasticity of the duty, the following results were obtained: for the period 1966 to 2003, buoyancy was 0.556 and elasticity of 0.282 was recorded. The period before import liberalization (1965 to 1982) gave a buoyancy of 0.33 and elasticity of 0.814, the period after the import liberalization (1983 to 2003), buoyancy of 0.313 and elasticity of 0.049 was estimated. A comparison of the results showed that duty buoyancy outweighed duty elasticity for the whole study period, which means that discretionary tax measures (DTMs) have significantly improved tariff revenue mobilization over the same period. Overall estimates obtained indicates however that import tax is neither buoyant nor elastic ion Ghana, hence the study suggested that a lot more needs to be done with respect to improvement in efficiency of the custom collection administration system to achieve the desired goal.

Also a study by Twerefou *et a*l, (2010) employed the Dummy variable technique to correct for the effects of Discretionary Tax Measures. Their findings showed that the overall tax system in Ghana was buoyant and elastic in the long-run and buoyancy exceeded the elasticity, however, in the short run the reverse was the case. They observed an improvement in both buoyancy and elasticity over the reform period (i.e. 1985 to 2007) as evidenced in the pre- reform and post reform buoyancy and elasticity coefficient which were generally less than unitary and became greater than one after the reform. The study concluded with an overall tax elasticity estimate of about 1.03, which suggests that the responsiveness of the tax system to a unit change in GDP was more than unity.

This research work however differs from the previous studies conducted in Ghana in the sense that all earlier studies hovered around revenue productivity of the tax system and buoyancy and elasticity of the various tax handles. Though Appiah (2013) examined the revenue productivity in the mining sector, this study seeks to measure the revenue generation capacity of the Information and communication sector with emphasis on the Telecommunication subsector, since it forms the largest share of the former. This sector has not been researched on in terms of its revenue productivity in the country. This study uses measuring the tax buoyancy and elasticity of the Telecommunication subsector.

This work will however focus on analyzing the contribution of ICT/Telecom sector to domestic tax revenue mobilization and will utilize the Auto-regressive Distributive lag model to carry out this thesis.

The study is imperative as it will help the government keep track on revenue mobilization with GDP growth in the telecom sector. Information generated about the responsiveness of

the tax to economic growth as well as elasticity and buoyancy will be used to analyze effects of economic growth to the tax system on total revenue which will offer more insight into the potentials of the sector performance in Ghana.

This work will also provide invaluable source of information to shape government policy that can enable the sub-sector perform at its best and generate more tax revenue than currently. The work is aimed at contributing to the stock of knowledge on revenue generation in the country which is shared by policy makers and researchers.

3.4.2.1 Lessons learnt for Tax Reforms

It is of relevance to note the tax reform experiences to date, since it offers some useful insights into designing appropriate tax policy and institutional development. Khalilzadeh-Shirazi and Shah (1995) gives a detailed discussion of this by providing a brief summary which is presented as follows;

i. The value added tax should be an instrument of choice for developing countries that are contemplating reform of their sales tax. Harberger (1990) attest that there was no such thing as value added tax (VAT) some fifty years ago. However, its introduction in the earlier 1950s, showed that VAT has become a fiscal innovation that has swept half of the world, and many developing countries are no exception. The VAT thus gained prominence and has thus become an instrument of choice for most developing countries contemplating reform of their sales tax. VAT can provide greater revenue, tax neutrality (economic Efficiency) and under certain instances, and a limited extent, vertical equity.

ii. The use of the tax system for special tax preferences should be carefully windfall evaluated by using the system to provide tax incentives (tax expenditures) usually causes a serious drain on the national treasury by conferring gains on existing activities or better still by shifting resources to tax-preferred activities.

iii. The base of the existing taxes should be broadened at the same time, the tax administration reform is carried out. Base broadening should be compatible with a number of economic objectives; in increasing revenue and improve simplicity, neutrality and equity of the tax system.

iv. The tax reform must take into account the initial conditions at home and abroad. In reforming their tax systems, developing countries are severely constrained not only in their own institutional settings but also by their tax structure in capital importing countries. Furthermore, the circumstances in many developing countries are usually such that they would experience serious transitional difficulties if the tax system were to be redesigned from the on-set. Developing countries must therefore take into consideration initial conditions at home and abroad.

v. The credibility of the tax regime is Key to the success of any tax reform. A stable tax policy environment is desirable since it encourages businesses to take a longer-term perspective in their finance and investment decision can potentially undermine the credibility of the tax regimes. Making tax changes without giving adequate considerations to transitional arrangements require much more careful analyses than they have hitherto been given in developing counties. Moreover, tax changes must be presented as part of long-term strategy to improve the public sector environment for the private sector. Thus, the tax regime will gain the confidence of the businesses, if more attention is given to the preparation and

analysis of reforms, advance consultation, providing a reasonable period of adjustment prior to implementation and ensuring consistency of the measures adopted by the reform.

vi. The process of the tax reform must be well coordinated: Well-coordinated tax reforms offers significant advantage over isolated piecemeal tinkering with the tax system. A coordinated reform ensures that individual tax changes will be consistent with the central objective. For example, reduction in tariffs without a corresponding increase in the other taxes, generally a value added type, can increase the fiscal deficit and hence exacerbate macroeconomic difficulties. In addition, to improve economic performance in general, tax reform should closely integrate with structural adjustment measures.

3.5 Summary of Literature Gaps

From the discussions so far, observations show that little empirical work has been done on services sector and tax revenue mobilization, which is the focus of this study. However, the review of the empirical work is relevant, as they point to works on revenue productivity shared by researchers elsewhere and in Ghana. These are relevant and are of enormous benefit as they have lessons for this present work, thus, for the purpose of this study, Mujahid and Alam (2014) model has been adopted with some modification by employing Auto-regressive Distributive Lag (ARDL) Framework. This technique is useful when the series are integrated at levels and/or at first difference and is known to provide efficient results, The use of revenue adjustment methods will not be applicable for this study, since we are interested to know the relationship and direction of services sector with reference to ICT contribution to domestic tax revenue generation. Hence, the proportional Adjustment method, Constant Rate

technique and the divisia index method may render unsatisfactory results since we are not interested at the elasticity and buoyancy of the tax system.

For the purpose of this study, the econometric model approach that will be adopted is autoregressive distributed-lag (ARDL) model is used as in (Ahmed and Ahsan, 2011; Enu, Addey, & Okonkwo, (2015) 2015; Mujahid and Alam 2014). The advantage of this method over the others is that it does not require sufficient data set that informed the choice of this method over the others.

This study covers a period spanning over 2008 to 2016. These years are chosen because the sector is young and the integration of IRS and VAT into one collecting agency under, GRA ACT 2009 ACT (791) have merged the data into an electronic or computerized dataset which is available for the said period. Due to smaller data points for annual series, quarterly data on individual taxes payable by the sector are aggregated. Hence contribution of ICT sector revenue will be used to ascertain its impact on Economic growth and total internal tax revenue mobilization of the sector as a share of total tax revenue is used.

This study differs from previous studies on the following grounds:

- It gives an in-depth analysis of contribution of ICT sector to total tax revenue mobilization which is not treated by other studies except a survey conducted by NCA (2006) that look at a small aspect of the subject. However, this study investigates the subsector's contributions to revenue productivity
- The study also investigates the challenges that confront the collection agencies in mobilizing the tax revenue from the telecommunication sector, which is worth studying, because the

outcome of the results from the study, will offer suggestion that can improve their revenue collection and hence raise additional revenue which hitherto was missed.

- It adopts (Ahmed and Ahsan, 2011; Enu, Addey,, & Okonkwo, 2015; Mujahid and Alam 2014) and the ARDL model framework with modification of the variables to accommodate the objective of the study. Unlike Dummy Variable technique to correct for the effects of Discretionary Tax Measures which Kusi (1998) used the proportional Adjustment Approach that can only be applied to estimated tax data but not actual. Brafu-Insaidoo and Obeng (2008), however, used the dummy variable method; their study focused on the effects of import liberalization on only one tax category that is import tariff revenue, specifically duty buoyancy and elasticity. Twerefou *et al,* (2010) also used the dummy variable method in their study of 'Tax buoyancy and Elasticity of tax: empirical evidence from Ghana, for the period 1970 to 2007'.Their study included in addition to the import duty other taxes such as personal income tax, company tax, value added tax and excise tax as well as the overall tax revenue in Ghana, In this study however, we utilized the sum of taxes both direct and indirect to determine the impact of /telecom tax revenue on total domestic tax revenue and how it influences growth Tax revenue of the Telecom proxied by ICT is aggregated for the following taxes paid by the industry; subsector Pay-As-You-Earn (PAYE) Corporate Income Tax (CIT), Value Added tax(VAT), Communication Services Tax (CST), National Health Insurance Levy (NHIL) and other taxes as income from self-employed collated from Ghana Revenue Authority.
- This study is different to that of the afore mentioned ones in the sense that, whilst they focused on the overall tax revenue in Ghana as in Kusi (1998) and Twerefou, Fumey and

Osei- Assibey (2010), this study seeks to analyze revenue productivity of a particular subsector and considers the aggregation of taxes payable by that sector

- From the previous studies mentioned above, Kusi (1998) and import liberation policy by Brafu-Insaidoo and Obeng (2008) was looked at. Twerefou *et al*, (2010) studied both the short run and long run impacts of tax reforms and other DTMs on revenue mobilization in terms of buoyancy and elasticity indices, this study however, looks at the impact of the ICT and on revenue productivity of Ghana and how it influences growth, in particular the Telecom sector in terms of its effects both in the short-run and long run.

CHAPTER FOUR

METHODOLOGY

4.0 Introduction

The chapter comprises of the model specifications, estimation technique and data sources. In addition, to confirm the authenticity of the findings from the quantitative study, interview on key GRA officials is conducted to know the challenges that confront tax administrators in the collection of taxes from the Telecom subsector are also presented.

4.1 Model Specification

The model specification of this thesis is based on the studies of Fosu and Magnus (2006), Sakyi (2011) and Takumah (2014) with some modifications to accommodate the objective at hand. The basic model is simply in the following form

$$y = f(X_1, X_2 \ldots\ldots\ldots\ldots, X_n) \qquad (4.1)$$

where, y is the dependent variable while, $X_1, \ldots X_n$ *represents* the independent variables under observation.

The dependent variable in this case is the TTR, which is expected to be influenced by inflation, foreign direct investment, real gross domestic product, real exchange rate, real interest rate and tax revenue from the ICT/ sector to determine the latter variable, influence on the total tax kitty of the country. The decision to focus on these macroeconomic variables as regressors are known to affect economic growth and hence influence Total Tax revenue as postulated by Solow (1956), FDI is a means which would determine the level of investors in the country who will also be liable to pay taxes. The model can be rewritten as:

$TTR_t = f\ (GDPR_t, INF_t, \text{REXR}_t, \text{RIR}_t, \text{ICTR}_t, FDI_t)$ (4.2)

And making room to include other variables which can impact growth according to Robert Solow, we specify the second regression model as

$GDPR_t = f\ INF_t, FDI_t, \text{REXR}_t, \text{RIR}_t, \text{ICTR}_t)$ (4.3)

Where,

$GDPR_t$ = GDP growth,

INF_t = Inflation

FDI_t =Foreign Direct Investment

REXR_t = Real Exchange rate

RIR_t = Real interest rate

ICTR_t = Tax revenue from the ICT sector

TTR_t = Total tax revenue

t = Time

Model 1 can be expanded as;

$$lnTTR_t = \alpha_0 + \alpha_1 lnGDPR_t + \alpha_2 lnINF_t + \alpha_3 lnFDI_t + \alpha_4 lnREXR_t + \alpha_5 lnICTR_t + \alpha_6 lnRIR_t + \varepsilon$$

where, α_0, is the intercept while, α_1, α_2, α_3, , α_4, α_5, *and* α_6 are the coefficients of INF, FDI, REXR, ICTR and RIR respectively.

Model 2 is also presented as

$$lnGDPR_t = \beta_0 + \beta_1 lnINF_t + \beta_2 lnFDI_t + \beta_3 lnREXR_t + \beta_4 \text{lnRIR}_t + \beta_5 lnICTR_t + \varepsilon$$

Where $\beta_{0,}$ is the intercept, β_1, β_2, β_3, β_4 *and* β_5 *are the* coefficients of *INF, FDI, REXR, RIR and the ICTR respectively.*

The dependent variable in this second model is real gross domestic product, which is also expected to be influenced by inflation, the level of foreign direct inflows, real exchange rate, real interest rate and revenue from the ICT sector

The model is specified the log form, that is both the dependent and independent variable should be in logs for it to be interpreted as elasticities. Thus, this is to ensure that the interpretation of the coefficients are elasticities or units. Elasticities are of significance as it shows the actual response of economic growth to changes in the regressors. Growth rate, real exchange and real interest rate are not specified in log forms since these variables have negative rates amongst the variables which would lead to the elimination of these negative values when their natural log is taken.

4.2 Data Source and Type

The study uses quarterly time series dataset from the period 2008 -2016. These were obtained mainly from secondary sources, including Bank of Ghana, World Development Indicators (WDI) Ghana Revenue authority and Ghana Statistical Service. The choice of the sample period was based on the availability of data on tax revenue for the ICT sector. The key variables for the study are Total Tax revenue, Tax revenue from ICT/Telecom sub-sector (ICTR) and Gross domestic Product (GDP). Total Tax Revenue (TTR) comprises of all taxes paid by individuals, firms and institutions. This includes corporate income tax, personal income tax (Pay- As-You-Earn), Value Added Tax, National health insurance Levy (NHIL),

custom and excise duties tax and other indirect taxes such as communication services tax (CST). Total tax revenue was obtained from Ministry of Finance (MoF), while revenue from ICT/telecom sub-sector (ICTR) was provided by the Ghana Revenue Authority (GRA). Gross Domestic Product (GDP) dataset was obtained from Ghana Statistical Service. Other data such as foreign direct inflows, real exchange rate, and real interest rate were obtained from Bank of Ghana and inflation rate was obtained from GSS. Some dataset were in monthly form, while others were quarterly.

4.3 Definition of Variables

The variables of interest to be estimated in the model are defined below and their *a priori expectations are discussed*.

4.3.1 Total Tax Revenue (TTR)

This refers to the summation of all taxes both direct and indirect paid by individuals, firms and institutions in Ghana. All sectors of the economy contribution to the total tax kitty are used. This include corporate income tax/company income tax paid by corporate entities, personal income tax by individuals, usually Pay- As –You- Earn tax, which is deducted from employees payroll income source. Indirect tax consists of Sales tax (replaced by VAT), custom and excise duty tax paid to Custom, Excise and Preventive Service (CEPS), and other taxes such as communication Services tax paid by communication service providers; including telecommunication service providers.

4.3.2 The Gross Domestic Product (GDP)

This measures the value of total amount of goods and services produced by the economy within a particular year and it signifies the economy's output per year. In this study, GDP is used as a measure of economic growth. It is expected that if an economy's output is increasing in size, then it should have capacity to generate more taxes from the various sectors, including services sector as the economy expands. ICT is seen as a boost to productivity and its expansion, not only increase the size of taxes paid but impacts on other sectors of the economy such as education, the banking and finance, insurance, manufacturing agricultural production and agro business sectors to mention but a few. As economic (Solow model and endogenous) growth theory opines, technology as total factor productivity is known to have positive influence on output growth and hence improves economic growth of the country. Thus, it is expected that the integration of ICT/ Telecom as well as its tax revenue will influence growth positively.

ICTR is therefore expected to have a positive relation with economic growth. And total tax revenue. A unit increase in revenue generated by ICT sector (percentage of GDP) would lead to a percentage increase in economic rate. The increasing inflow of tax revenue from the ICT sector is an indication of more technological and business know-how being transferred from developed countries into the developing countries (Romer, 1993). This would lead to robustness in all sectors of the economy thus lead to economic growth.

4.3.3 Inflation (INF)

Inflation is the persistent increase in the general price level of goods and services. For the purpose of this study, the proxy for the measure of inflation used is the quarterly inflation rate which is the percentage change in the consumer price index (CPI) is used. So inflation

by this data is a ratio, logging it will lead to overestimation and 'killing' the value of the estimates. The rate of Inflation influences the level of investment in the country. Low rate will encourage investors and the high returns as a results will impact on their net profits, which will translate in paying additional taxes than before

4.3.4 Foreign Direct Investment (FDI)

This refers to the amount of inflows from abroad in the form of technological and its know-how, human capital, liquid cash amongst a host of others. The FDI in this study, uses the OECD measure of foreign direct investment, where net FDI refers to inflows. Thus net FDI refers to inflows but not outflows are used. It is expected from theory that foreign inflows influences growth positively

4.3.5 Real exchange Rate (REXR)

The real exchange rate is an indicator that measures a country's international competitiveness. It is hypothesized that a real depreciation would attract more investors into the country. It is measured as nominal exchange rate multiplied by the relative price of a market basket of goods in the country. Faruquee (1992) finds real exchange rate in Sub-Saharan Africa to be significantly correlated to private investment and hence growth in tax revenue generation. Real exchange rate is thus, expected to be positively related to growth and total tax revenue of the country.

4.3.6 ICT Total Tax Revenue (ICTR)

This is the summation of all direct tax (Pay–As- You-Earn (PAYE) and Company Income tax CIT) and indirect taxes (VAT, NHIL and CST) payable by communication service operators

and telecom companies and other levies such as custom duties collected by the Ghana Revenue Authority. ICT is seen as an important enabler of better tools to drive productivity. Dedrick et al (2003), in a conclusive review of over 50 scholarly studies on ICT and productivity published between 1987 and 2002, found that at both the firm and the country level, greater investment in ICT is associated with greater productivity growth. Almost nearly all scholarly studies since the mid-1990s through to 2014 have found positive and significant effects of ICT on productivity' hence influences growth and internal tax revenue generation of the country (Miller and Atkinson, 2014). It is expected that revenue from the ICT sector influences growth positively.

4.3.7 Real Interest Rate (RIR)

Real interest rate refers to the interest rate after adjusting for inflation. This is a good determinant of the level of investment in any country. Investors seek to maximize higher returns on money invested. Hence, if interest rate that are earned are higher and the interest rate at which funds can be borrowed are relatively lower, will potentially induce more investments. More investments means more income, which will translate in the payment of more taxes and hence stimulate economic growth. Real interest rate is expected to influence growth and domestic revenue positively.

4.4 Estimation Strategy

This sub-section outlines the estimation strategies, which involves, the test of stationarity, cointegration test and diagnostic tests. The results of the stationarity test will inform the choice or use of ARDL, Johansen or Toda Yamamota approach or other cointegration methods.

4.4.1 Stationarity Test

The use of time series data for analysis requires stationarity tests of the variables to determine the level of stationarity whether at level or first difference before variables are used in the regression. The order of integration test is necessary for econometric model specification in co-integration process. To determine a rigorous stationarity check of the variables, this study applied both the Augmented Dickey-Fuller Test (ADF) and Phillips-Perron (PP) Following Philips and Perron (1988), the PP tests are based on the Augmented Dickey Fuller regression, and the critical values are the same as those used for the DF tests since Augmented Dickey -Fuller (DF) is an extension of Dickey -Fuller test. The ADF regression is specified as;

$$\Delta yt = \alpha 1 + \alpha 2t + \alpha 3yt - 1 + \sum_1^n (A\Delta yt - 1) + \mu_i \qquad (4.6)$$

Where Δ represents the difference operator, y is the natural logarithm of the series, t is a trend variable. α_1, a_2 and α_3 are the coefficients to be estimated. A is the vector of the estimated parameters of the lagged values of the differenced value of time series, which stands for the vector of the lagged value of the differenced value of the series and u is the error term.

The null hypothesis of the presence of unit root is rejected if the coefficient is significantly different from one. Thus implying stationarity in the data set, however the absence of stationarity is accepted when the null hypothesis is not rejected thus confirming the presence

of unit root. So the ADF and the PP are run at level and first difference with trend and intercept.

4.4.2 Co-Integration and Bounds Test

The bounds test is an estimation procedure which is used to test the long run relationship given the fact that the time series is strictly at level, I(0) or first difference I(1) or a combination of both. It makes use of the F- and t - statistics to test for the significance of the lagged variables when there is uncertainty if the time series exhibits a trend or its stationary at first difference.

$$\Delta yt = \propto 0 + \sum_{i=1}^{p} (\beta i\, \Delta Xt - i + \sum_{j=1}^{q} \gamma \Delta Zt - j + \varepsilon t \qquad (4.7)$$

From equation 4.7, we perform an overall F-test of the null hypothesis that there is no co-integration between the variables X and Z as against the alternative that it is not true. The rejection of the null hypothesis implies that there exist long run relationships between the variables. The ARDL Bounds test gives an upper and lower boundary with which the overall F-statistic is to be compared. If the F-test is greater than the upper boundary, we reject the null hypothesis while an F test lower than the lower boundary meets the criteria for the acceptance of the null hypothesis. The outcome is inconclusive if the F-test falls in between these two boundaries.

4.5 The ARDL Model

All variables used in the study are aggregate national data, as such they are subject to the unit root test using the Augmented Dickey-Fuller and PP test to justify the stationary status. Implications of the unit root test result on the estimation procedures are first checked, should

no unit root exist, then all variables are stationary, thus the Ordinary Least Square (OLS) method can be used in estimation. Secondly, if all variables in the equation are found to be non-stationary and of an order I(1), then the cointegration test can be conducted to find the existence of a long-run equilibrium relationship. On the other hand, if the variables confirm the existence of cointegration, then the conventional Error Correction Model (ECM) l is estimated using OLS which confines short-run dynamics and long-run equilibrium as the error correction term will be constructed using the Error Correction Model to estimate for coefficients. Thirdly, if the variables are found to have a combination of stationary and non-stationary variables, then the Autoregressive Distributed Lag (ARDL) model is used in the estimation.

This study employs the ARDL technique to estimate the relationship between ICT tax revenue, rate of GDP and Total tax Revenue (TTR). This econometric technique has numerous advantages which makes it suitable for analysis. Firstly, it is significant approach to test for co-integration within a small sample size. Also, according to Pesaran et al (2001), this method can be applied to time series data with combinations of I(1) and I(0) but most prominently when they are stationary at the first difference [I(1)]. This means that the ARDL technique makes it more flexible so as to avoid problems associated with pre-testing in co-integration, which requires that the variables be already classified into I(1) or I(0). The ARDL model specifies both the long run and short run impact of the independent variables on the dependent variables. The researcher considers the model of the form *ARDL* (*p*,*q*,*k*) the long run outcome form the ARDL regression process is specified as;

$$TTR_t = \alpha_0 + \sum_{i=1}^{p} \lambda\, TTR_{t-i} + \sum_{i=1}^{q} \beta\, INF_{t-i} + \sum_{i=1}^{k} \gamma\, ICT_{t-i} + \varepsilon_t \qquad (4.8)$$

The short run dynamics of the coefficient from the regression process is expressed by finding the error correction model associated with the long run estimates.

$$\Delta TTR_t = \alpha_0 + \sum_{i=1}^{p} \lambda \Delta GDP_{t-i} + \sum_{i=1}^{q} \beta \Delta INF_{t-i} + \sum_{i=1}^{k} \psi \Delta ICT_{t-i} + \sum_{i=1}^{h} \theta \Delta RIR_{t-i} + \sum_{i=1}^{r} \delta \Delta FDI_{t-i} + \sum_{i=1}^{v} \varpi \Delta REXR_{t-i} + \gamma E_{\tau-i} + \varepsilon_t \quad (4.9)$$

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^{p} \lambda \Delta TTR_{t-i} + \sum_{i=1}^{q} \beta \Delta INF_{t-i} + \sum_{i=1}^{k} \psi \Delta ICT_{t-i} + \sum_{i=1}^{h} \theta \Delta RIR_{t-i} + \sum_{i=1}^{r} \delta \Delta FDI_{t-i} + \sum_{i=1}^{v} \varpi \Delta REXR_{t-i} + \varepsilon_t \quad (4.10)$$

Where: $E_{\tau-i}$ represents the error correction factor whereas γ is the speed of adjustment. The error correction tells the speed of adjustment of the variables to the long run should there be any deviation. The error correction factor should be negative and significant. The negative state spells out the fact that with any deviation from the long run, the variables would turn back to equilibrium. However, a positive error correction term tells the explosive state of the variables an indication of no return back to its equilibrium.

4.6 Data characteristics

The times series data for the study is analyzed to ensure its stability and long run relationship between the variables as well as short run disequilibrium.

4.6.1 Optimal Lag Structure

Streams of criteria are available to aid in the optimal selection of lags for various analysis using different methodologies. The most commonly used criterion are the Akaike Information Criterion (AIC), the Schwartz-Bayesian Information Criterion (SBCI) and the

Hannan-Ouinn Information Criterion (HIC). It should be noted that the introduction and optimal selection of lags in time series is very critical since an incorrect lag selection can cause autocorrelation. In the selection of the optimal lag length (p) to be employed in the ARDL model, in this study both the AIC and the SBIC to choose the appropriate optimal lag lengths of the variables that produce errors that approach a white noise process.

CHAPTER FIVE

PRESENTATION AND ANALYSIS OF RESULTS

5.1 Introduction

This chapter presents the empirical results from the econometric analysis based on the stated objectives and the discussion of results. The Auto-Regressive Distributed Lag (ARDL) model is employed for the estimation. The chapter begins with the general descriptive analysis of the variables under study, followed by the examination of their degree of correlation and further to analyze the trends of the dependent variable of focus. Test of stationarity and co-integration as well as the long and short run regression outcome are presented.

5.2 Descriptive Analysis

Descriptive analysis gives a general understanding of the actual state of the variables under study, it brings to bare the number of observations, the minimum and maximum values as well as the mean and standard deviation of our dependent and independent variables.

Table 5.1 below, displays the summary statistics of the selected time series variables from 2008 to 2016, there are 36 observations in all since they are quarterly frequencies. As indicated in Table 5.1, GDP growth rate and Total Tax Revenue are the dependent variables for the two models and a measurement of economic growth ranged between 1.44 and 3.53 and has a mean and standard deviation of about 2.23 and 2.03 respectively. On the side of ICT tax revenue measurement, the statistics indicates a range of 28,979,617 Cedis and

183,000,000 Cedis and has a mean of 55,855,922 Cedis. The table also shows that all variables (real gross domestic product, interest rate and tax revenue from information and communication sector) with the exception of inflation are positively skewed. Judging by the kurtosis values, GDPR and ICTR are the variables are significant at 10% and 1 % respectively this is confirmed by the Jarque-Bera test, as indicated by the p-values, the null hypothesis is accepted for all variables under consideration except revenue from ICT.

Table 5.1 Summary of Descriptive Analysis

	TTR	GDPR	FDI	ICTR	INF	IR	REXR
Mean	1234.283	2.225545	684.1148	72245177	14.04547	28.20306	2.252833
Median	1089.556	2.033905	701.4053	55855922	14.75635	27.50500	1.891750
Maximum	2639.010	3.528403	1414.480	1.83E+08	20.74254	32.75000	4.327400
Minimum	279.8800	1.439182	129.9300	28979617	8.396021	24.25000	0.978000
Std. Dev.	761.7730	0.540291	325.2620	45345744	4.070266	2.466259	1.062316
Observations	36	36	36	36	36	36	36

Source: Author's own computation

In terms of high tendency of fluctuations, inflation and interest rate are more pruned to fluctuations as compared to the other macroeconomic variables per the study. Real exchange rate, real interest rate and FDI have mean of 2.25, 28.20 and 684.11 respectively and standard deviation of 1.06, 2.47, and 325.26 respectively.

5.3 Stationarity Test Results

The need for testing for the presence or otherwise of unit root in time series data has both economic and statistical implication is worth noting in time series analysis. Statistically, a regression of non-stationary time series can result into spurious relationships when ordinary least squares methods are applied on the data. It is t recommended that a unit properties of the variables under study must be investigated. Hence, the importance to know the order of integration of each of the series in the model prior to estimation. In this study both the Augmented Dickey Fuller (ADF) and Phillip-Perron unit root test unit root are applied to investigate the unit root characteristics of the selected times series. This use of both stationarity test is useful since both have their strengths and weaknesses and using both stationarity check complements each other and gives a better picture of the trend of the variables under consideration. The ADF and the PP test are known to produce efficient and unbiased results. Table 5.2 presents the summary of stationary test results based on the Augmented Dickey Fuller and Phillip-Peron unit root tests.

The results indicates that with exception of FDI and real exchange rate all other variables are non-stationary in levels. However, their first difference indicates that the series are stationary.

The null hypothesis of unit root could not be rejected for all the series at the level for the Augmented Dickey Fuller (ADF) tests except for net foreign inflows and real exchange rate was rejected at about 1% level of significance indicating foreign inflows and real exchange rate are stationary at levels. However, the unit root null is flatly rejected at 1% level of statistical significance for the ADF tests for economic growth, domestic inflation, and ICT

revenue growth rates. We therefore conclude that all the underlying series except FDI and Real exchange rate in the present study are integrated of order one [I(1)] with Log of FDI and real exchange rate being integrated of order zero I(0). The series are thus a mixture of levels and first differences stationary data. The economic implications of unit root is that shock to all the variables under study except log of FDI and inflation rate would have a lasting effect (lack of mean reversion) but shocks to FDI and real exchange rate would have only temporary effects.

Table 5.2: Unit Root Test Results

Variable	**Level/First Difference**	**ADF-statistic**	**PP Statistics**	**Order of Integration**
LnTTR	Level	0.5591	0.4706	stationary at first difference
	First difference	0.0000***	0.0000***	**I(1)**
LnGDPR	Level	0.3194	0.345	stationary at first difference
	First difference	0.0000***	0.0000***	**I(1)**
RIR	Level	0.3177	0.2111	stationary at first difference
	First difference	0.0001***	0.0001***	**I(1)**
LnFDI	Level	0.0001***	0.0001***	stationary at level
	First difference	0.0000***	0.0000***	**I(0)**
LnICTR	Level	0.8291	0.0480**	stationary at first difference
	First difference	0.0000***	0.0000***	**I(1)**
REXR	Level	0.9800	0.9778	stationary at first difference
	First difference	0.0002***	0.0001***	**I(1)**
LnINF	Level	0.4151	0.5437	stationary at first difference
	First difference	0.001***	0.0008***	**I(1)**

Note ; ***, **, * = significant at 1%, 5% and 10% respectively

5.4 Results of Bounds Test and Co-integration Test

Table 5. 3 below, displays the results of the bounds test approach to co-integration, all variables except FDI were integrated of order 1(1). The overall F- statistic for the variables were all statistically significant at 1%. This is evident in the fact that the F-statistic is higher than the upper bound. This indicates the presence of the long run relationship amongst inflation, interest rate, real GDP, ICT tax revenue and the real exchange rate. The null hypothesis of no co-integration amongst the variables is rejected. The implication of the co-integration amongst the variables is that, in the short run there exist at least some form of economic relationship between the variables whether there is a structural break or not.

Table 5.3 shows the cointegration results for model 1. A cointegration regression was run for the estimated equation. The dependent variable Total Tax Revenue (TTR) was run on all the independent variables as stated by the model. The results indicated that there exist at least some long run relationship in the variable under study.

Table 5.3 Co-integration Test Results (Model 1)

Results of bounds Tests for long Run Cointegration for Model 1

Dependent variable	F-statistic	Conclusion
FlnTTR (lnTTR| lnRGDP lnINF REXR RIR lnICTR lnFDI)	17.3988	Cointegration
FlnGDPR (lnGDPR| lnINF REXR RIR lnICTR lnFDI lnTTR)	2.49477	No Cointegration
FRIR (RIR| lnRGDP lnINF REXR lnICTR lnFDI lnTTR)	4.6100	No Cointegration
FlnFDI (lnFDI| lnRGDP lnINF REXR RIR lnICTR lnTTR)	6.988231	Cointegration
FlnICTR (lnICTR| lnRGDP lnINF REXR RIR lnFDI lnTTR)	25.9470	Cointegration
FREXR (REXR| lnRGDP lnINF RIR lnICTR lnFDI lnTTR)	2.711994	No Cointegration
FlnINF (lnINF| lnRGDP REXR RIR lnICTR lnFDI lnTTR)	3.547261	No Cointegration

In the case of the model 2, the cointegration results, showed a long run relationship as indicated by the F-statistic (the jointly significance of the variables). The computed F-statistic is compared with the standard limits of the Pesaran et al., (2001) asymptotic basic esteem limits. If the computed F-statistic is greater than the upper limit, Reject Ho indicating the presence of cointegration, on the other hand, if computed F-statistic is less than the lower limit, do not reject Ho, implying No cointegration. If computed F falls between lower bound and upper bound limit, then the variable is indeterminate.

The Null and alternative Hypothesis is stated as follows;

H_0: $a = b_0 = b_1 = b_2 = b_3 = c_0 = c_1 = c_2 = 0$

H_0: $a \neq b_0 \neq b_1 \neq b_2 \neq b_3 \neq c_0 \neq c_1 \neq c_2 \neq 0$

Table 5.4 **Co-integration Test (Model 2)**

Results of bounds Tests for long Run Cointegration for Model 2

Dependent variable	F-statistic	Conclusion
FlnGDPR (lnGDPR| lnINF REXR RIR lnICTR lnFDI)	6.4318	Cointegration
FRIR (RIR| lnRGDP lnINF REXR lnICTR lnFDI)	5.7625	Cointegration
FlnFDI (lnFDI| lnRGDP lnINF REXR RIR lnICTR)	10.79538	Cointegration
FlnICTR (lnICTR| lnRGDP lnINF REXR RIR lnFDI)	4.595077	No Cointegration
FREXR (REXR| lnRGDP lnINF RIR lnICTR lnFDI)	0.746644	No Cointegration
FlnINF (lnINF| lnRGDP REXR RIR lnICTR lnFDI)	4.287631	No Cointegration

Pesaran et al., (2001)		
Critical Value Lower Bounds	**Critical Value Upper Bounds**	**Significance Level**
4.04	4.78	10%
4.94	5.73	5%
6.84	7.84	1%

5.5 Regression Results

The regression outcome from the application of the ARDL methodology gives the results for the analysis. These are presented in tables 5.5 and 5.6 respectively.

Table 5.5: Long run estimates for Model 1

Model 1	**Dependent Variable = LnTTR**			
Variables	**Coefficient**	**Standard Error**	**T-Statistic**	**P-Value**
RIR_{t-1}	0.071251***	(0.02273)	[3.13435]	0.0038
$LnFDI_{t-1}$	-0.211975*	(0.11953)	[-1.77342]	0.0863
$LnICTR_{t-1}$	-0.977686***	(0.09987)	[-9.78947]	0.0000
$REXR_{t-1}$	-0.649414***	(0.06701)	[-9.69149]	0.0000
$LnINF_{t-1}$	0.556423***	(0.13342)	[4.17044]	0.0002
$LnGDPR_{t-1}$	1.951549***	(0.25128)	[7.76635]	0.0000
Constant	8.754224***	(2.30836)	[3.79241]	0.0007

Notes: ***, **, * = significant at 1%, 5% and 10% respectively.

The results of the long run estimates show that all variables, except FDI are significant at 1% level. Also, with exception of inflation and real exchange rate, that is significant at ten

percent significant level Inflation and real GDP are positively significant to total domestic tax revenue, while all are negatively significant in the long run FDI, revenue from ICT sector and real exchange rate are negatively significant, indicating in the long run, they exert contraction to total domestic revenue generation. The negative coefficient of the ICT revenue is likely to be due to government policy of subsidizing the cost of ICT infrastructure, making ICT accessible to all. For our variable of interest, which is revenue from the ICT/telecom sector, a unit increase in ICT tax will cause Total tax revenue to contract by 0.009 units, that is likely to reduce the consumption of ICT services.

Table 5.6: Short run Estimates for Model 1

Model 1	**Dependent Variable = LnTTR**			
Variables	**Coefficient**	**Standard Error**	**T-Statistic**	**P-Value**
$\Delta LnTTR_{t-1}$	-0.754280***	(0.19785)	[-3.81242]	0.0007
ΔRIR_{t-1}	-0.030626	(0.02450)	[-1.24987]	0.2019
$\Delta LnFDI_{t-1}$	0.012471	(0.05104)	[0.24433]	0.7569
$\Delta LnICTR_{t-1}$	0.167023**	(0.07314)	[2.28375]	0.0347
$\Delta REXR_{t-1}$	0.182962	(0.14819)	[1.23468]	0.2068
$\Delta LnINF_{t-1}$	-0.064212	(0.25727)	[-0.24959]	0.8692
$\Delta LnGDPR_{t-1}$	-0.496056**	(0.20769)	[-2.38844]	0.0253
ECM (-1)	-0.192598**	(0.07723)	[2.49371]	0.0216
R-Squared = 0.9558			F-Statistic = 86.5270	
Log Likelihood = 19.2809			Prob (F-Statistic) = 0.0000	

Notes: ***, **, * = significant at 1%, 5% and 10% respectively.

In the short run, revenue from ICT and real GDP were highly significant variables at five percent level, while the latter exerts a contraction of revenue under study were negatively insignificant, except ICT and FDI which were positively insignificant. For the variable of interest, that is the how ICT revenue influences total internal revenue, a unit increase in taxes for the sector cause domestic revenue to increase by 0.167.

Table 5.7: Long run Estimates for Model 2

Model 1	**Dependent Variable = LnGDPR**			
Variables	**Coefficient**	**Standard Error**	**T-Statistic**	**P-Value**
RIR_{t-1}	0.041196***	(0.01270)	[3.24314]	0.0029
$LnFDI_{t-1}$	-0.021660	(0.05772)	[-0.37524]	0.7103
$LnICTR_{t-1}$	-0.085152***	(0.03019)	[-2.82021]	0.0084
$REXR_{t-1}$	-0.160558***	(0.02241)	[-7.16372]	0.0000
$LnINF_{t-1}$	0.073461	(0.08644)	[0.84986]	0.4021

Notes: ***, **, * = significant at 1%, 5% and 10% respectively.

Per the estimates of model 2, all variable exert an influence on growth rate of GDP and were significant, with the exception of FDI in the long run. A unit increase in tax is likely to cause a contraction in revenue mobilization. This is consistent with theory, because excessive

tariffs or tax increase will stifle investments in ICT/telecom services and reduce the usage of such services should the cost be relatively high. This may have the potential of defeating government policy initiative of making ICT and telecommunication service accessible to all.

In terms of the other variables, Real exchange rate negatively influences total tax revenue generation. This is consistent with our *a priori* expectations. This is because instability in the local currency will discourage investments, which eventually will impacts negatively to total tax revenue mobilization. However, FDI as negatively insignificant fail to meet our expectation, since in economic theory, it is expected to impact growth positively.

5.5.1 Short run Estimation for Model 2

Table 5.1.4 below shows the short run estimates of model 2. The results indicated that all the variables were all insignificant in the short run, Also interest rate and inflation are negatively related to growth. This is consistent with theory as macroeconomic instability affects growth negatively. Per the estimate for FDI, which is negatively insignificant to growth fails to meet our expectation as the results conflicts with our results. However the positive coefficient of revenue of the ICT sector indicate some economic importance of its impact on total domestic revenue.

Table 5.8: Short run Estimates for Model 2

Model 2	**Dependent Variable = LnGDPR**			
Variables	**Coefficient**	**Standard Error**	**T-Statistic**	**P-Value**
$\Delta LnGDPR_{t-1}$	0.029915	(0.20417)	[0.14652]	0.9779
ΔRIR_{t-1}	0.014814	(0.02520)	[0.58778]	0.8972
$\Delta LnFDI_{t-1}$	-0.058053	(0.05051)	[-1.14939]	0.3275
$\Delta LnICTR_{t-1}$	-0.011219	(0.06175)	[-0.18168]	0.9829
$\Delta REXR_{t-1}$	0.040903	(0.14490)	[0.28228]	0.6325
$\Delta LnINF_{t-1}$	-0.235729	(0.27388)	[-0.86071]	0.5193
ECM (-1)	-0.355281**	(0.15299)	[-2.32229]	0.0302
R-Squared = 0.9558 Log Likelihood = 19.2809			F-Statistic = 86.5270 Prob (F-Statistic) = 0.0000	

Notes: ***, **, * = significant at 1%, 5% and 10% respectively.

5.5.2 Short run Estimation

This section presents statistical results that do not consider any major structural break which involves major policies implementations in the economy. This would bring afore the exact quantitative impact of ICT revenue on total domestic revenue and ICT tax revenue on the general performance of the economy without accounting for major recovery programs in Ghana such as the Economic Recovery Program (ERP).

The outcome of the short run results from the ARDL is presented in table 5.5 and 5.6 above. Two separate regressions were run, the first focused on the two main macroeconomic

variables of interest which are ICT tax revenue accrued for the period under study and Total tax revenue generated for the economy. The second model includes four other control variables which are relevant when it comes to economic growth based on the Solow growth model. The variables include net foreign investment, inflation, real exchange rate, and real interest rate. In model two, the short run impact of ICT tax revenue on economic growth was evident with coefficients of 0.167 and -0.011 respectively. Real exchange had the highest impact on economic growth. Followed by the ICT tax revenue that impacts economic growth positively and is significant at 5 percent. A unit change in ICT tax revenue would cause output growth to increase by almost 0.0014. An increase in ICT tax revenue thus causes economic growth, this meets our a priori expectation.

As it was expected that ICT tax revenue should positively affect economic growth. Care should thus be taken in the explanation of the relationship between variable from the short run to the long run, inflation does not lead outright to declining rate of economic growth but gradually cause increasing growth in the short run. FDI however did not meet the study's expectation by having a negative impact on economic growth, a unit increase in FDI would cause a contraction in growth by approximately 0.0063 unit. This fails to confirm literature, because it is known to influence growth and tax revenue ICT tax revenue of positive impact turned out to be statistically significant to changes in total domestic tax revenue. In contrast. Interest rate and Inflation negatively impact economic growth and significant at 5% while FDI was insignificant. thus with the exception of real exchange rate, ICT tax revenue tend to be the major cause of economic growth per the second model of the study.

We therefore rejected the null hypothesis of ICT tax revenue not having any significant impact on economic growth in Ghana. In the second model, with the introduction of the control variables, the magnitude of ICT tax revenue on Total tax revenue impact positively although still positive but not significant at 5%. A percentage increase in ICT tax revenue increases total domestic tax revenue by 10%.This points to the fact that ICT-related policies that promote its usage as well as making ICT and telecom available for all will led to increase in Domestic public resources, which in turn will be used to be invested in ICT and Telecom infrastructure, leading to revenue productivity. FDI, however assumed a negative relationship an indication of contraction in growth when FDI increases and was still insignificant. This negative relationship and insignificance perhaps stems from the fact that the FDI‟s are channeled to specific sectors of the economy whose contribution to growth are not so significant for growth. It is argued that the services sectors including the financial and non-financial institutions contribute more to growth, nevertheless more of the FDI‟s are channeled to the mining sectors instead (Frimpong *et al.*, 2011).

In both models, the R^2 which indicate that the 95% and 90% of the variation in the dependent variables are explained by the independent variable which is high and satisfactory. On a whole the two models were all jointly significant as confirmed by the values of their F-statistics.

The long run results in terms of the coefficient result of the lagged error correction term is significant at 5 percent level with the expected sign. This is an indication that the variable of the bound test cointegration value is estimated as -0.36 percent which implies that the speed of adjustment to equilibrium after a shock is approximately 36 percent of equilibra resulting

from the previous years' shock. This converges back to the long run which implies that it converges back to equilibrium in the current year.

5.6 Diagnostics Test

Diagnostic test for model 1

To ensure robustness and reliability of model 1, the study tested for the presence of normality, serial correlation and heteroscedascity. Normality of the series was tested using Jarque-Bera statistics. The study concluded that the residual is normally distributed because Jarque-Bera probability = 0.9332 is greater than 0.05. The serial correlation LM test also failed to reject the null hypothesis that there is no serial correlation since P =0.1477 greater than 0.05. Lastly, Breusch-Pagan-Godfrey was used to test the null hypothesis of no heteroscedascity. The result also shows there is no heteroscedasticity since p value =0.4993 is greater than 0.05. Finally, the study employed Ramsey Reset to test for model specification. The null hypothesis states that the model is correctly specified. The study failed to reject the null hypothesis since P value =0.3154 is greater than 0.05. Hence, the study conclude that functional form is correctly specified

Table 5.9a: ARDL ECM Model 1 Diagnostic Test

Test Statistic	LM Version (Prob)	F Version (Prob)
A. Serial Correlation	χ^2 (2) 0.2159	F (2,20) = 3.644827 (0.1447)
B. Normality		0.933214 (0.627127)
C. Heteroscedasticity	χ^2 (8) 0.4389	F (8, 22) =0.9476 (0.4993)
D. Functional form		F (1, 21) =6.9554 (0.3154)

A refers to Langragian Multiplier test of residual correlation

B Based on test of skewness and kurtosis of residuals

C Based on the regression of squared residuals as squared fitted values

D Ramsey RESET TEST USING the squared fitted values

Diagnostic test for model 2

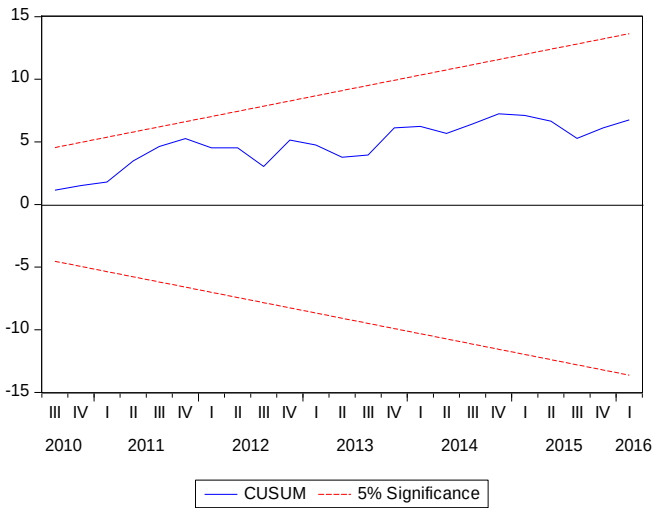
To ensure robustness and reliability of model 2 results, the study tested for the presence of normality, serial correlation and heteroscedascity. Normality of the series was tested using Jarque-Bera statistics. The study concluded that the residual is normally distributed because Jarque-Bera probability = 0.599682 is greater than 0.05. The serial correlation LM test also failed to reject the null hypothesis that there is no serial correlation since P =0.2439 greater than 0.05. Lastly, Breusch-Pagan-Godfrey was used to test the null hypothesis of no heteroscedascity. The result also shows there is no heteroscedasticity since p value = 0.4993 is greater than 0.05. The null hypothesis states that the model is correctly specified. The study failed to reject the null hypothesis since P value = 0.7270 is greater than 0.05. Hence, the study conclude that functional form is correctly specified.

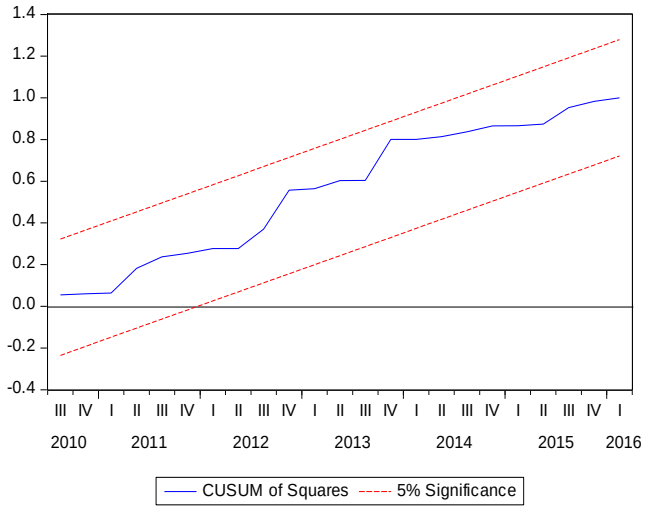
Table 5.9b: ARDL ECM Model 2 Diagnostic Test

Test Statistic	**LM Version (Prob)**	**F Version (Prob)**
A Serial Correlation	χ^2 (2) 0.1055	F (2, 18) = 1.5278 (0.2439)
B Normality		1.022712 (0.599682)
C. Heteroscedasticity	χ^2 (10) 0.5102	F (10, 20) =0.8482 (0.4993)
D. Functional form		F (1,19) = 0.125591 (0.7270)

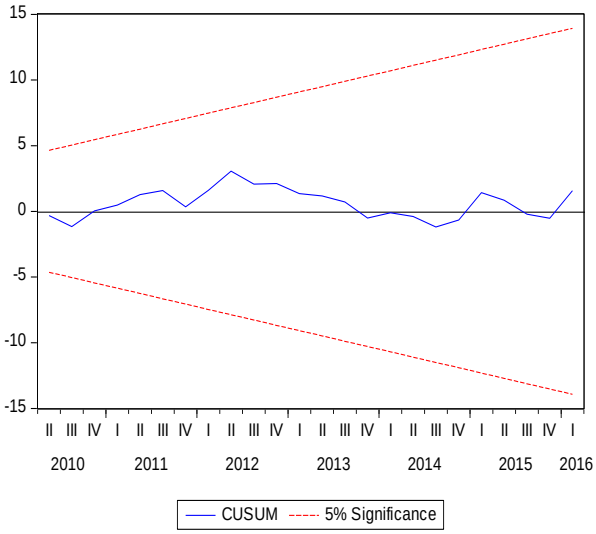
In conclusion, the LM and F tests for the two models are not statistically significant, thus has passed the test of serial correlation, functional form and heteroscedacity tests and the results show that the residuals from the regression are normally distributed.

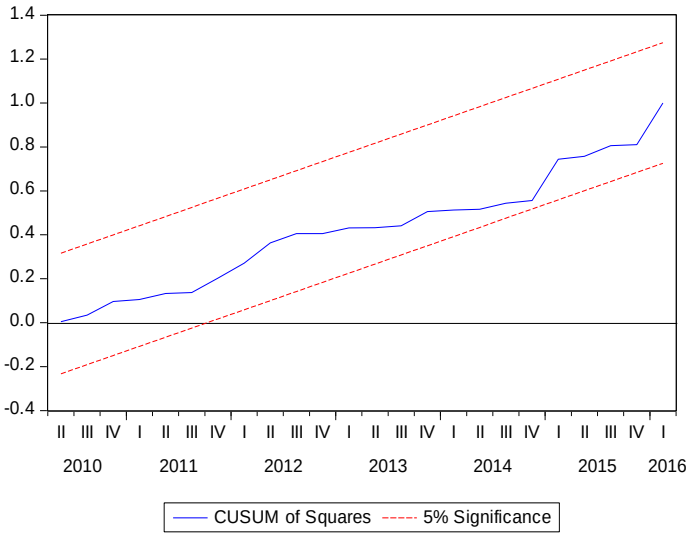
CUSUM and CUSUM Squared for Model 1





CUSUM and CUSUM Squared for Model 2





5.7 Challenges to tax collection from the /Telecom sector in Ghana

This sub-section presents challenges that tax administrators face in the mobilization of taxes from the Telecommunications sector. This section was not meant to be a separate qualitative study, but a means to probe the authenticity of findings of the quantitative study. Since such information has not been validated in literature, there was the need to interview key personalities from GRA Large Tax payer unit and MoF tax Policy Unit. The selection was done to serve the purpose of the objective at hand. In all three people were used to elicit the information through one-on-one personal interview, since these personnel were knowledgeable in Telecom tax collection and were assigned to that task. The information was obtained from the Deputy Commissioner of GRA, Large Tax Payer unit, the Statistician of the unit and a senior officer from Ministry of finance (MoF) tax policy unit. A formal response by the afore-mentioned officers were collated in the quest to elicit information on challenges facing tax revenue officers in administrating taxes from the Telecommunications sector were discussed. (See Appendix for the interview questions).The response by the executive officers are summarized as follows:

5.7.1 The complexity of telecom activity

The complex nature of their activities poses a challenge to tax assessment and collection. Tax officers are sometimes not able to identify tax point in transactions undertaken by telecommunication companies. This is due to lack of understanding in their business operations.

5.7.2 Lack of tax Experts to Audit Taxes from Telecom sector

Lack of capacity to audit the ever changing telecom sector. Auditing these taxpayers sometimes becomes a problem. Tax officers lack the requisite skills to effectively conduct an audit in the Telecom industry and hence, relies on data provided by these telecom operators. To address this challenge, government should put in a number of measures to train the tax administrators in IT related area such as, telecom engineering and other areas of specialization to effectively identify which areas to focus in their investigations.

5.7.3 Underestimation of taxes by Telecom Companies

The telecom players are able to effectively plan their Tax. The industry players are able to plan their tax affairs so that their liabilities will be reduced since they have huge resources under their disposal and can hire the best tax consultants to assist them and their business operations are also international in nature. As a result whatever they present as payment of taxes cannot be challenged.

5.7.4 Lack of resources by GRA to maximize tax from the telecom sector

The resources available to tax officers to assess and collect tax in the sector are limited. These telecom operators' activities are complex and wide operations and it is expected that enough resources are allocated to tax officers to validate their data computerization to track their activities to maximize CST and other taxes. However, it is not always the case.

5.7.5 Base Erosion and Profit Shifting (BEPS)

Telecom companies which have their mother residence in foreign multi-international companies tend to pay taxes as determined by their home residence abroad and may pay less taxes per call and benefit from transfer pricing. Such taxes may be relatively huge and hence enjoy transfer pricing in the course of their activities.

5.7.7 Some Firms do not pay corporate taxes

Most of the mobile telecommunication companies do not pay corporate taxes in Ghana. For the past five years, only one mobile telecommunication company, according to GRA, pay their corporate tax obligation. Such taxes are based on the profit of the company after adjusting their operation expenses. However, attempt to mobilize such taxes have proved unsuccessful by reason of the complexity of their operation.

CHAPTER SIX

CONCLUSION AND POLICY RECOMMENDATIONS

This final chapter focuses on the overall conclusion of the study, which summarizes the entire study with emphasis on the main findings.

6.1 Summary of Key Findings

This project work is an attempt to investigate and analyze the impact of Services sector contribution to total internal revenue, specifically, how revenue from the ICT sector contributes to total domestic tax revenue and its extension on economic growth of Ghana using data from 2008 to 2016 sourced from the GSS, GRA, and BOG, GIPC and NCA and other relevant sources. Additional information to the literature is the challenges that tax administrators' face in collection of taxes from the ICT sub-sector. With regards to determine ICT tax revenue on growth and on total domestic revenue of the country, a model was developed based on theoretical and empirical literature to establish the relationship between ICT tax revenue and economic growth and then to domestic tax revenue mobilization of the country.

The results revealed the following outcome; First, FDI, real exchange rate and tax revenue from ICT sector were positively related to economic growth and domestic total tax revenue in the short run whiles FDI, real interest rate and inflation were inversely related to economic growth in the short run.

However, Tax revenue from ICT and exchange rate were the only significant variables that impacted on economic growth positively in the short run. The insignificance of FDI implies the channeling of this foreign investment into wrong sectors of the economy rather than the productive sector.

Secondly, the study observed a long run relationship in the variables under consideration, however our variables of concern, ICT tax revenue on economic growth and total domestic revenue still maintained its stance of being positive and significant while the control variables, FDI and interest rate turned to be insignificant in the short run contrary to the significance of ICT tax revenue and exchange rate in the short run. Per the mode under study. All the other control variables except, real interest rate and log of FDI were insignificant to economic growth in Ghana, with inflation negatively affecting growth this meets *a prior* expectation and consistent with theory.

This may be due to government rechanneling resources into ICT and telecommunication infrastructure through its expenditures, such investment will not only improve the ease of doing business, but encourage efficiency in other sectors of the economy which will go a long way to improve total domestic revenue of the country.

The study revealed the insignificance of all other variables to total domestic revenue. For our variable of interest (ICT revenue), though insignificant at 5%, it is positively related to total domestic tax revenue mobilization. This result may be associated to tax exemptions given to the subsector to encourage the usage of technology, in line with government policy to make

ICT and telecommunication accessible for all sectors of the economy. Notwithstanding, tax avoidance by the IT and Communication operators may also have contributed to low revenue capacity of the sub-sector, coupled with their dominance in the informal sector, whose activities are not monitored and hence do not pay taxes as evident from the qualitative study, as well as Interest rate, FDI and its contribution to economic growth in the Ghanaian economy specifically, in terms of foreign Direct Investment (FDI). This result was associated with the possibility of investment being channeled to the unproductive sectors of the economy. Nevertheless, in terms of growth, Tax revenue from ICT sector and exchange were the two main factors that affected economic growth in Ghana. ICT revenue positively influenced growth whiles real interest rate, log of FDI and inflation negatively affected growth. These findings imply adopting ICT-driven policies that would necessarily boost economic growth.

In order to confirm the findings of the study, interviews were conducted from Ghana Revenue Authority officers, to access the major problems facing the tax administrators in the collection of taxes from the ICT and Telecommunication sector in the country. This aspect of the study is justifiable to ascertain whether taxes are paid and by such businesses to maximize tax yields. The responses are summarized as follows;

- The complexity of ICT and Telecom activity poses challenge to tax assessment and collection
- Lack of tax Experts to Audit Taxes from Telecom sector
- Underestimation of taxes by Telecom Companies
- Lack of resources By GRA to maximize tax collection from the telecom sector

- Base Erosion and Profit Shifting (BEPS) minimizes taxes paid by foreign owned mobile telecommunication companies

6.2 Policy Recommendations

Per the outcome of the study, these policy recommendations are put forward to improve revenue mobilization from the ICT and telecom sub-sector. Policy makers should target the ICT sector in transferring technology in businesses, banking, finance and insurance services and telecommunication services that has opened business outlets in mobile money banking, broadband, mobile services, these does not only create jobs and investments but positively affect the productivity of other sectors of the economy. This consequently, ensure economic expansion and increase public resources generated through taxation. Therefore, policy makers should enact policies that encourage investments into the ICT and telecommunication industry and ensure sound macroeconomic stability in reducing inflation rate, stability of our local currency and ensuring interest rate are attractive, coupled with broadening the tax base and marginalizing the tax rate for all sectors including the ICT and telecommunication sector, will help boost economic performance and ensure maximum revenue mobilization, critical for sustainable growth and development.

To mitigate the challenges facing tax agency in the collection of taxes from the telecommunication sector, the government should take pragmatic steps to resource the GRA in order to undertake the following;

- Put in mechanism in technology to track Telecom operations. Such as tracking Telecom calls and data usage for purpose of maximizing CST revenue.

- Strengthen transfer pricing Unit in GRA to tackle issues of Base erosion and profit shifting (BEPS) in the industries
- Capacity building of staff of GRA who have also been trained as tax experts in that field is necessary to effectively and efficiently audit Telecom Companies (Telecos) will help maximize tax revenue.
- GRA must be resourced in terms of logistics (Computerization of their system)

  Also the National Communication Authority, the agency responsible for regulating ICT and telecommunication in Ghana, should be strengthened to effectively regulate their activities. With the introduction of uniform Communication platform in which all telecommunication companies are brought together should be strengthened to help the industry's productivity '. The NCA should liaise with GRA, to foster and sensitize, not only the registered telecom operators but the informal ones. This will help widen the tax net and even with marginal tax rates, more revenue will be realized for the benefit of Ghana.

6.3 Suggestion for Further Study

In future, I recommend the expansion of this study to cover all the other sectors of the economy to also see the trend in tax revenue capacity of those sectors. I also recommend that the number of years for the yearly revenue be examine pre and post liberalization of Telecommunication industry in Ghana to get a very good picture of its contribution to domestic tax revenue of the country.

REFERENCES

Adenugba, A.A. & Ogechi, C.F. (2013). The Effect of Internal Revenue Generation on Infrastructural Development. A study of Lagos State Internal Revenue Service College of Business and Social Sciences.

Adudu S.A & Ojonye, M. S (2015). The Impact of Tax Policy on Economic Growth in Nigeria Journal of Economics and Sustainable Development. 6(8).

Africa Market Output Report (2015), Available at https://www.google.com/search?q=africa+market+report+2015&ie=utf-8&oe=utf-8&client=firefox-b-ab. (Accessed June 23, 2018).

Ahmed, A., & Ahsan, H. (2011). Contribution of services sector in the economy of Pakistan.

Anyanfo, A.M.O. (1996). Public Finance in a Developing Economy: The Nigerian Case. Department of Banking and Finance, University of Nigeria, Enugu Campus, Enugu.

Anyanwu, J. C. (1997). The structure of the Nigerian Economy (1960-1997). Joanee educational publishers.

Appah, E. & J.K. Oyandonghan, (2011). The challenges of tax mobilization and management in the Nigerian economy. J. Bus. Admin. Manage, 6(2): 128-136.

Appah, E. (2004). Principles and practice of Nigerian taxation. Ezevin Mint Printers and Publishers, Port Harcourt.

Appiah, H. L. (2013). Tax reforms & revenue mobilisation: a case study of the mining sector of Ghana. PhD diss., University of Ghana.

Ariyo, A. (97). Productivity of the Nigerian tax system: 1970-1990.

Arnold, J. M., Brys, B., Heady, C., Johansson, Å., Schwellnus, C., & Vartia, L. (2011). Tax policy for economic recovery and growth. The Economic Journal, 121(550), F59-F80.

Asnafi, A., & Hamid, A. (2008). The role of ICT in developing of knowledge Centre of Iran information and scientific evidence.

Ayoki, M., Obwona, M., & Ogwapus, M. (2005). Tax reforms and domestic revenue mobilization in Uganda.

Balachandran, V., & Malini, K. H. (2013). Compliance of service tax provisions by advertising agencies. South Asian Journal of Marketing & Management Research, 3(2), 1-9.

Bannock, G., Baxter, R. E., & Davis, E. (1998). The Economist Books Dictionary of Economics. John Wiley and Sons.

Belloumi, M. (2014). The relationship between trade, FDI and economic growth in Tunisia: An application of the autoregressive distributed lag model. Economic systems, 38(2), 269-287.

Bhatia, K. B. (2001). Specific inputs, value-added, and production linkages in tax-incidence theory. Public Finance Review, 29(6), 461-486.

Brafu-Insaidoo, W., & Kwasi Obeng, C. (2008). *Effect of Import Liberalization on Tariff Revenue in Ghana* (No. RP_180). African Economic Research Consortium

Chenery, H. B. (1960). Patterns of industrial growth. The American Economic Review, 50(4), 624-654.

Chenery, H. B. (1979). Structural change and development policy (No. 04; HD82, C4.).

Choudhry, N. N. (1975). A Study of the Elasticity of the West Malaysian Income Tax System, 1961-70. Staff Papers, 22(2), 494-509.

Choudhry, N. N. (1979). Measuring the elasticity of tax revenue: A divisia index approach. *Staff papers*, *26*(1), 87-122., Oxford University Press, Oxford.

Dedrick, J., Gurbaxani, V., & Kraemer, K. L. (2003). Information technology and economic performance: A critical review of the empirical evidence. ACM Computing Surveys (CSUR), 35(1), 1-28.

Diamond, P. A., & Mirrlees, J. A. (1971). Optimal taxation and public production I: Production efficiency. The American Economic Review, 61(1), 8-27.

Enu, P., Addey, A. A., & Okonkwo, C. B. (2015). The Driving Forces of the Service Sector of the Ghanaian Economy. *Global Journal of Management Studies and Researches*, *2*(2), 83-93.

Faruquee, H., (1992). Dynamic capital mobility in Pacific-Basin developing countries. Staff Papers, International Monetary Fund 39, 706–717.

Fosu, O. A., & Magnus, F. J. (2006). Bounds testing approach to cointegration: an examination of foreign direct investment trade and growth relationships.

Frimpong, E. A., Gemmill-Herren, B., Gordon, I., & Kwapong, P. K. (2011). Dynamics of insect pollinators as influenced by cocoa production systems in Ghana. *Journal of Pollination Ecology*, *5*.

Fumey A (2009) Buoyancy and Elasticity of tax: Empirical Evidence from Ghana

Gani A and Clemes M.D (2002). Services and Economic Growth in ASEAN Economies ASEAN Economic Bulletin, 19(2), 155-169.

Goode, R. (1984). Government Finance in Developing Countries (Washington: The Brookings Institution).

GSS (2016). Provisional2016AnnualGross Domestic Product. Available at http://www.statsghana.gov.gh/docfiles/GDP/GDP2017/April/Annual_2016_GDP_April%202017_Edition.pdf. (Accessed May 25, 2018).

Harberger, A. (1990). Principles of taxation applied to developing countries: What have we learned? World Tax Reform: Case Studies of Developed and Developing Countries, 25-46.

Hassan, K., & Abdullah, A. (2015). Effect of oil revenue and the Sudan economy: Econometric model for services sector GDP. Procedia-Social and Behavioral Sciences, 172, 223-229.

Inflation and the Income Tax, Brookings Institution, Washington, DC, 215-232.

Institute of Statistical, Social and Economic Research. (2015). The State of the Ghanaian Economy 2015. Available at http://isser.edu.gh/index.php/sger/50-the-state-of-the-ghanaian-economy-report-2014. (Accessed June 1, 2018).

Institute of Statistical, Social and Economic Research. (2016). The State of the Ghanaian Economy 2016. Available at *isser.edu.gh/index.php/sger/238-the-state-of-the-ghanaian-economy-2017. (Accessed June 1, 2018).*

Isyaku, K. (1997). Technology education and vision 2010. In A keynote address delivered at the 2nd National conference on technology education FCE (Technical) Gusau from 15th–18th September.

Karingi, S. N., & Wanjala, B. (2005). The Tax Reform Experience of Kenya (No. 2005/67). Research Paper, UNU-WIDER, United Nations University (UNU).

Khan, M. Z. (1973). The responsiveness of tax yield to increases in national income. The Pakistan Development Review, 12(4), 416-432.

Kusi, N. K. (1991). Ghana: Can the Adjustment Reforms be sustained? Africa Development/Afrique et Développement, 181-206.

Kusi, N. K. (1998). Tax reform and revenue productivity in Ghana.

Kuznets, S. (1957). Quantitative aspects of the economic growth of nations: II. Industrial distribution of national product and labor force. Economic development and cultural change, 5(S4), 1-111.

Mastrini, G., & Aguerre, C. (2009). Telecommunications regulation and broadband development: Implications for the Andean region. CILAC research reports; 1/6.

McMahon, G. and Berrios, M. (1991). Tax Reform and Macroeconomic Policy in Developing

Miller, B., & Atkinson, R. (2014). Raising European productivity growth through ICT.

Ministry of Finance, (2013). 2013 Budget Statement and Economic Policy. Available at https://www.mofep.gov.gh/publications/budget-statements. (Accessed Febraury 6, 2018).

Ministry of Finance, (2017). 2017 Budget Statement and Economic Policy. Available at https://www.mofep.gov.gh/publications/budget-statements. (Accessed Febraury 6, 2018).

Mujahid, H., & Alam, S. (2014). Service sector as an engine of growth: Empirical analysis of Pakistan. Asian Economic and Financial Review, 4(3), 377.

National Communication Authority (2017). Study on Contribution of ICT/Telecommunications Sector to Gross Domestic Product (GDP) In Ghana. Available at https://nca.org.gh/.../ict-contribution-to-gdp-in-ghana-stakeholder-feedback-on-th... *(Accessed April 5, 2018).*

Newberry, K. J. (1998). Foreign tax credit limitations and capital structure decisions. Journal of Accounting Research, 36(1), 157-166.

Nyamadi, G. (2014). Tax Policy and Economic Growth: Evidence from Ghana (Doctoral dissertation, University of Ghana).

Nzotta, S. M. (2007). Tax evasion problems in Nigeria: A critique. The Nigerian Accountant, 12(1), 40-43.

OECD (2005), "Growth in Services - Fostering Employment, Productivity and Innovation", OECD Digital Economy Papers, No. 94, OECD Publishing, Paris. Available at http://dx.doi.org/10.1787/232370436752. (Accessed May, 30, 2018).

OECD (2012), OECD Review of Telecommunication Policy and Regulation in Mexico, OECD Publishing .Available at http://dx.doi.org/10.1787/9789264060111-en (Accessed April 26, 2018).

Osei, R. D., & Quartey, P. (2005). Tax reforms in Ghana (No. 2005/66). Research Paper, UNU-WIDER, United Nations University (UNU).

Osoro, N. E. (1993). Revenue productivity implications of tax reform in Tanzania. Centre for the Study of African Economies, University of Oxford, Oxford, GB.

Otto, J. M. (2000). Mining taxation in developing countries. *UNCTAD, November. Geneva: UNCTAD, mimeo*.

Pearce, D. W. (1986). Macmillan dictionary of modern economics. Macmillan International Higher Education.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of applied econometrics, 16(3), 289-326.

Phillips, P.C.B., & Perron, P., (1988). Testing for unit root in time series regression. Biometrica 75, 335-346.

Rácz, A. (1972). Services—The Tertiary Sector. Acta Oeconomica, 221-236.

Ramsey, F. P. (1927). A Contribution to the Theory of Taxation. The Economic Journal, 37(145), 47-61.

Rath, D. P., & Raj, R. (2006). Analytics and implications of services sector growth in indian economy.

Romer, C. D., & Romer, D. H. (2010). The macroeconomic effects of tax changes: estimates based on a new measure of fiscal shocks. American Economic Review, 100(3), 763-801.

Romer, P. (1993). Idea gaps and object gaps in economic development. Journal of monetary economics, 32(3), 543-573.

Sakyi, D. (2011). Trade Openness, foreign aid and economic growth in post-liberalization Ghana: An application Of ARDL bounds test. Journal of Economics and International Finance, 3, 146-156.

Sarma, J. V. M., & Naresh, G. A Macro Fiscal Adjustment Model for Tamil Nadu State in India.

Scarlett, H. G. (2011). Tax policy and economic growth in Jamaica. Bank of Jamaica working paper.

Shalizi, Z., & Squire, L. (1988). Consumption Taxes in Sub-Africa: Building on Existing Instruments. Value And Taxation in Developing Countries, Washington, DC, The World Bank, Washington DC.

Slemrod, J. B. (1990). Tax effects on foreign direct investment in the United States: Evidence from a cross-country comparison. In Taxation in the global economy (pp. 79-122). University of Chicago Press.

Smith, A. (1776). An inquiry into the nature and causes of the wealth of nations: Volume One. London: printed for W. Strahan; and T. Cadell, 1776.

Solow, R. M. (1956). A contribution to the theory of economic growth. The quarterly journal of economics, 70(1), 65-94.

Southwood, B. (2014). Who Pays Corporation Tax. Adam Smith Institute.

Sulman Hafeez, S., & Hassan Mujtaba Nawaz, S. (2008). Services-led Growth and Industrial Policy: Lessons for Pakistan.

Takumah, W. (2014). Tax Revenue and Economic Growth in Ghana: A Cointegration Approach.

Tanzi, V. (1976). Adjusting Personal Income Taxes for Inflation: The Foreign Experience.

Tekper, S. (1995). "Ghana's Tax Administrative Reforms (1985-1993)", Tax Research Series No. 21. Available at http://www.cid.havard.edu/hiid/504.pdf. (Accessed June 14, 2018).

Terkper, S. E. (2016). The 2016 Budget Statement and Economic Policy of the Government of Ghana. Available at: www. mofep. gov. gh. (Accessed April 20, 2018).

Thirsk, W. (Ed.). (1997). Tax reform in developing countries. The World Bank.

Todaro, M., & Smith, S. (2009). Urbanization and Rural-Urban Migration: Theory and Policy (Eds.), Economic Development.

Twerefou, D. K., Fumey, A., Assibey, E. O., & Asmah, E. E. (2010). Buoyancy and elasticity of tax: evidence from Ghana. Journal of Monetary and Economic Integration, 10(2), 36-70.

Unni, J., & Naik, R. (2011). Rural Structural Transformation: The Case of the Services Sector in India. Economic and Political Weekly, 196-200.

Wellenius, B. (1984). On the role of telecommunications in development. Telecommunications Policy, 8(1), 59-66.

Widmalm, F. (2001). Tax structure and growth: Are some taxes better than others?. Public Choice, 107(3-4), 199-219.

Yueh, L. (2013). What drives China's growth? National Institute Economic Review, 223(1), R4-R15.

APPENDICES

Questions for personal Interview to elicit information about challenges tax administrators face in collecting taxes from ICT/Telecom operators.

1. In your opinion, do you have a constraint in collecting tax revenue from ICT and Telecommunication industry?

   (a) Yes (b) No (c) Not sure

2. If the answer to Question 1 is Yes, can you enumerate those challenges you encounter in collecting taxes from the ICT and Telecommunication service operators.

3. In your view, how can such challenges be mitigated?