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Tax Revenue Generation and the Economic Development of Ghana

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Abstract
The objective of this paper is to explore the impact of tax revenue on the economic development of Ghana and the Gross Domestic Product which measures economic development was used as a proxy. The paper also examines tax reforms and the effect of automation on tax revenue performance, sources of revenue leakages and measures to improve the collection of taxes. The Least Square Multiple Regression was used to explore the relationship between GDP (the dependent variable) and Tax Revenue (Independent Variable) for the period 1999-2014. Tax Revenue is made up of Direct Taxes, Indirect Taxes and taxes collected by the Customs Division. This has been on the increase but more is need to reduce the deficit of Ghana. A simple hypothesis was formulated in the null form which states that there is no significant relationship between Tax Revenue and Ghana's GDP. The Regression result indicated a very positive and significant relationship and hence a positive impact of Tax Revenue on economic development of Ghana.
Keywords: GDP, Domestic Tax Revenue, Customs Revenue, Tax Evasion, Tax Avoidance, Tax Expenditure, Tax Holiday, Tax Reform, Tax Gap, Transfer Pricing, Leakages in revenue, Revenue generation

1.0 Introduction

Revenue mobilization in Ghana has been on the increase with the share of tax revenues to GDP increasing from an average of about 11 per cent over the decade preceding the Economic Recovery Programme (ERP) in 1983 to about 19% in 1998. In comparative terms this was higher than the Sub-Saharan (excluding South Africa) average by about 1 percentage point although still lower than the African average of about 24.5 per cent in 1998 (Tony Addison and Robert Osei).

Revenue generation has been enhanced by tax reforms since 1984. The objective of this paper is to explore how reforms in the tax system and the effect of automation on revenue increases, sources of revenue leakages and how these can be sealed for more revenues to be generated.

The next section looks at the Tax System in Ghana and the third section summarizes tax reforms in Ghana since 1984. The fourth section examines the effect of automation on Tax revenue performance. Section 5 looks at sources of Tax revenue leakage and section 6 discusses measures to enhance Tax revenue performance. Section 7 looks at a review of literature, data presentation and analysis and discussion of the results. Section 8 gives the conclusions and section 9 acknowledgements.

2.0 The Tax System in Ghana

Ghana Revenue Authority (GRA) was established by Act 791 on the 31st December, 2009 to replace the Internal Revenue Service, the Customs, Excise and Preventive Service and the Value added Tax Service for the administration of taxes and to provide for related purposes.

Objects of the Authority are to

- Provide a holistic approach to tax and customs administration;
- Reduce administrative and tax compliance cost and provide better service to taxpayers;
- Promote efficient collection of revenue and the equitable distribution of tax burden and ensure greater transparency and integrity;
- Ensure greater accountability to Government for the professional management of tax administration;
- Improve information linkage and sharing of information among the Divisions of the Authority;
- Provide a one-stop service for taxpayers for the submission of returns and payment of taxes;
- Provide common tax procedures that enable taxpayers to be governed by a single set of rules; and
- Provide for other matters related to the improvement of revenue administration.

Functions of the Authority

To achieve the objects the Authority shall

- Assess and collect taxes, interest and penalties on taxes due to the Republic with optimum efficiency;
- Pay the amounts collected into the Consolidated Fund unless otherwise provided by the GRA Act and other Acts;

- Promote tax compliance and tax education;
- Combat tax fraud and evasion and co-operate to that effect with other competent law enforcement agencies and revenue agencies in other countries;
- Advise District Assemblies on the assessment and collection of their revenue;
- Prepare and publish reports and statistics related to its revenue collection;
- Make recommendations to the Minister on revenue collection policy; and
- Perform any other function in relation to revenue as directed by the Minister or assigned to it under any other enactment. (Ghana Revenue Authority Act 791)

The Authority has three Divisions: Domestic Tax Revenue Division (DTRD), Customs Division, Support Services Division. For the administration of taxes we have DTRD Direct, DTRD Indirect and Customs Division.

Taxes collected by the DTRD Direct include: PAYE, Self-Employed, Company Tax, Mineral Royalty and Other taxes.

The DTRD Indirect collects Domestic VAT, Domestic National Health Insurance Levy, Domestic Excise and Communication Service Tax. A Special Petroleum Tax has been introduced in the 2015 Budget which is collected by Customs but has been credited to the DTRD Indirect since it is a VAT on petroleum products.

The Customs Division collects Import Duty & Levies, Import VAT, Import National Health Insurance Levy and Petroleum Tax.

3.0 Tax Reforms in Ghana since 1984

- June 1984 tax rates on cigarettes and beer were increased, whilst those on personal income tax were lowered.
- 1985, National Revenue Secretariat (NRS) was established, as well as two major revenue organizations Customs, Excise and Preventive Service (CEPS) and Internal Revenue Service (IRS)) as autonomous institutions outside the civil service. The NRS was responsible for supervising the activities of CEPS and the IRS as well as recommending revenue policy to the government. An investment code that provides a range of tax incentives for investors (mainly in agriculture, manufacturing, construction and tourism) was introduced.
- 1987, Corporate tax rate on manufacturing concerns reduced to 45 per cent from 55 per cent; special taxes on cigarettes, beer, alcoholic and non-alcoholic beverages; excise duties imposed on all locally produced goods except petroleum products; 10 percent sales tax on domestic electricity consumption was abolished; abolition of import duty and purchase tax on all commercial vehicles; deduction of duty on basic raw materials and capital goods.
- January 1988, Reintroduction of sales tax clearance certificate to enforce timely payment of sales tax and excise duties collected on behalf of the government by manufacturers.
- January 1990, Introduction of super sales tax on luxury goods, ranging from 50 per cent to 500 percent.
- 1991, the super sales tax was reduced to a new range of 10 to 100 per cent; corporate taxes applicable to agriculture, manufacturing, real estate, construction and services were lowered to about 35 per cent; the NRS was relocated under the Ministry of Finance although it retained some degree of independence; the personal income tax threshold is raised from the ¢126,000.00 to ¢150,000.00.
- 1993, the contract for the design and implementation of the VAT was signed. Increase in petroleum taxes to counteract the pay increases awarded to civil servants and other public service organizations in the election year. Petrol, kerosene and gas oil prices increased by about 60 per cent, whereas LPG increased by about 20 per cent.
- 1994, Debt collection unit established under the Ministry of Finance in January. In December the VAT bill was passed into law and became operational in March, 1995.
- 1995, VAT became operational in March at a flat rate of 17.5 per cent compared with the sales tax of 15 per cent. In June VAT was withdrawn and sales tax reintroduced at a rate of 15 per cent after mass demonstrations in almost all the regional capitals in the country.
- 1996, the petroleum sector was deregulated. This involves a process whereby the procurement of crude oil and finished products needed as a top-up of the Tema Oil Refinery capacity will be through competitive tendering between all the oil marketing companies and the Ghana National Petroleum Corporation (GNPC).
- 1998, Reintroduction of the VAT at a rate of 10 per cent adopted by Parliament in February. Taxpayers Identification Numbers were introduced to make assessment and collection of taxes from small businesses and market traders easier. (Seth Terkper 1995)
- 1998, the VAT Service was established to administer service and consumption taxes. Revenue

Agencies Governing Board (RAGB) established with responsibility to supervise and co-ordinate activities of the Revenue agencies and continue the tax reforms.
- 2002, retention of part of revenue to strengthen semi-autonomous status.
- 2004, Large Taxpayer Unit set up on pilot basis, to operate on functional lines and introduce one-stop-shop operations.
- 2006, Tax Policy Unit at the Ministry of Finance was established to serve as a unit to collate, co-ordinate and monitor tax policies implementation.
- 2009, Integration of all revenue agencies adapted – included in 2009 Budget as official Government policy. December 2009 Ghana Revenue Authority Act 791 was passed to provide legal basis for the Authority.
- 2010, thematic areas of further tax reforms were identified
- 2011, Strategic Management approach adapted (Strategic and Modernisation Plans)
- These tax reforms have increased revenue considerably. Refer to Table 1

4.0 Effect of automation on Tax Revenue Performance

In the 1990s, Ghana undertook fundamental trade policy reforms, which was supported by bilateral and multilateral donors. The United States, IMF and the World Bank provided substantial adjustment lending as well as support for the development of private enterprises and exports.

By 1998, Ghana had implemented many policy reforms, but foreign direct investment was still lagging. A number of reviews by the World Bank, the IMF, the Foreign Investment Advisory Service and the Multilateral Investment Guarantee Agency, among others, suggested that policy reforms to have the desired impact on trade, foreign direct investment and growth they had to be complemented by the lifting of a number of structural investment constraints. In particular, the government needed to improve the operational efficiency of frontline agencies at facilitating investment flows. Such frontline agencies included the Customs Division of the Ghana Revenue Authority (GRA), the Ghana Immigration Service, the port authorities and the Ghana Investment Promotion Centre. The government took those suggestions to heart and decided to launch the Ghana Gateway Project, for which it solicited support from the World Bank.

Ghana adopted a customs management system that had been designed for Mauritius and interfaced smoothly with its version of TradeNet. As part of the arrangements, a company was to be created that will be charged with implementing both Ghana's version of TradeNet and the Ghana Customs Management System (GCMS) for the Customs Division of GRA by means of what virtually amounted to a builddown-operate-transfer contract.

With a view to ensuring broad stakeholder commitment to the project, various private and public entities were invited to participate in the equity of the company that would manage TradeNet and help computerize customs operations.

The company, known as the Ghana Community Network (GCNet), was created as a joint venture company with SGS (60 per cent), Customs (20 per cent), the Ghana Shippers Council (10 per cent), GCB (5 per cent) and ECOBANK (5 per cent) as its shareholders.

SGS had operated the Ghana preshipment service until 1988, had knowledge of the country and wanted to expand its portfolio of services to the government. By participating with a majority stake, SGS strove to meet its accountability obligations by having the necessary operational authority.

In November 2000, GCNet was incorporated with equity of US$5.3 million (total investment to date are now estimated at US$7 million). Customs contribution consisted of in-kind equity (namely, computer equipment that it had procured with World Bank funding under the Gateway Project. The other equity partners contributed cash.

At Kotoka International Airport, revenues for July to September 2003 were nearly 40 per cent higher than during the same period in 2002. Five percentage points of this was due to the depreciation of the cedi against the U.S. dollar during that period. The increase does not appear to have been caused by an increase in the volume of imports, because estimates indicate that import volumes have stagnated year to year. With no real change in the activities of the Destination Inspection Companies during this period, GCNet operations are conservatively estimated to have added 30 per cent the customs revenues from airport traffic. (Luc De Wulf 2004).

Table 1
REVENUE COLLECTION FROM THE IMPORT SECTOR FOR 1999-2014 GH¢million

YEAR	IMPORT REVENUE	% GROWTH
1999	110.43	
2000	169.54	53.53
2001	244.01	43.92
2002	328.80	34.75
2003	493.15	49.98
2004	633.73	28.51
2005	755.50	19.21
2006	866.74	14.72
2007	1,196.74	38.07
2008	1,533.49	28.14
2009	1,799.35	17.34
2010	2,167.78	20.48
2011	3,177.61	46.58
2012	4,157.27	30.83
2013	4,788.53	15.18
2014	6,265.04	30.83

Source: Ghana Revenue Authority

For the years 2002-2003 in the table 1, above, import revenue increased by 49.98%. This supports the assertion by Luc De Wulf.

5.0 Sources of Tax Revenue leakage

The mobilization of tax revenue is an important policy objective. While governments can do little in the short run to change the structural determinants of tax revenue (such as the composition of value added), they can alter other factors that influence tax revenue, such as economic policies, the level of corruption, and the quality of tax administration. As documented by Nashashibi and Bazzoni (1994), the wide divergences between the effective and statutory tax rates in many countries in the region indicate that there is scope for raising revenue without increasing tax rates by reinforcing tax and customs administrations, reducing tax exemptions, and fighting fraud and corruption. Nevertheless, Heller (1997, p. 41) cautions that “one must be realistic in terms of improvement in revenue ratios that can be reasonably expected to be achieved in many African countries, given the low level of development and the heavily agricultural and informal character of their economies.” In addition, Tanzi (1998) cautions that the fight against corruption takes time, needs to be undertaken on several fronts, and can be costly. Furthermore, tax mobilization and reform can be achieved only when there is strong political will and leadership to adopt the necessary measures (Hamada, 1994)

Tax holidays are time-limited exemptions from the Company Income Tax (CIT), which may or may not be renewable. They are widely regarded as a particularly ill-designed form of investment incentive, and one that poses considerable dangers to the wider tax system: They are open to abuse, undermining tax revenue by providing entrepreneurs with a strong incentive to use transfer pricing and financial arrangements to shift taxable profits into holiday enterprises: by arranging, for example, for taxpaying companies (able to deduct the interest payments) to borrow from holiday companies (not taxable on interest received). Such devices can operate across national borders, and also between domestic firms. However clever the legal provisions crafted to address this risk, experience suggests that companies will prove adept in finding ways to avoid them. Even the most developed tax administrations have great difficulty dealing with such abuse. (Mintz, 1990). Revenue leakages in Ghana occur through Tax Avoidance, Tax evasion and Tax Expenditures.

Tax Evasion

Tax evasion often entails taxpayers deliberately misrepresenting the true state of their affairs to tax authorities to reduce their tax liability

Tax evasion occurs in the form of smuggling cigarettes, textiles and rice. Smuggling of cigarettes has been on the ascendancy irrespective of measures introduced by Customs.

Cigarettes have attracted the highest indirect taxes, this has been one of the reasons for smuggling of cigarettes into Ghana. A study undertaken by British American Tobacco Limited estimated revenue lost to the country every year to be US$3.5 million.

Another area is the smuggling of textiles into the country which is having adverse effect on the textile industry locally and government revenue

The government has since November 1, 2013, restricted the importation of rice into Ghana through

Kotoka International Airport, Tema and Takoradi. Despite the ban on overland importation of rice, importers still use unapproved routes because it cost less to do that.

Tax Avoidance

Tax avoidance is the legal usage of the tax regime to one's own advantage to reduce the amount of tax that is payable by means that are within the law

In Ghana Tax Avoidance comes in the form of transfer pricing, based erosion and profit shifting and these poses problems to tax administration. Furthermore, some companies both foreign owned and indigenous, seem to be engaged in a continuing smart game of trying to out-wit the DTRD to maximize tax allowable deductions and minimize overall tax liability. Some Free Zone companies are exploiting the Free Zone Act to reduce legitimate tax to government.

Tax Expenditure

Tax Expenditure is referred to as revenue the government forgoes through the provisions of laws that allow for deductions, concessions, exclusions, reliefs or exemptions from taxpayers' tax expenditure, income or investment; deferral of tax liabilities, or preferential tax rates

Tax expenditures constitute government spending outside the budget allocations and tend to reduce Tax Revenue.

In Ghana Tax Expenditures for the period 2008-2013 amounted to GH¢12,179.49 million.

6.0 Measures to Enhance Tax Revenue Performance

The Ghana Revenue Authority is in the process of stamping out tax evasion and avoidance by companies and individuals taxpayers whose business operations extend beyond Ghana. This will be achieved through tax transparency and information sharing between Ghana and other countries where the companies and individuals operated based on request. With all the problems that transfer pricing and based erosion and profit shifting poses to tax administration, it has become imperative to put in place an effective mechanism that plugs the loopholes and prevents tax avoidance and evasion. (George Blankson, Commissioner-General of the Ghana Revenue Authority, 2015).

To ensure that corporate bodies and individuals lived up to their tax obligations, Ghana has invested resources in signing a number of multilateral conventions and tax information agreements. Additionally, Ghana had passed a transfer pricing regulation and also established a unit for transfer pricing audits in order that corporate bodies and individuals pay the right amount of tax at the right time in the right place. (George Blankson, Commissioner-General of the Ghana Revenue Authority, 2015).

- To check smuggling, the government has passed a law (Excise Tax Stamp Act 2013, Act 873) and an Executive Instrument came into force on 9th December, 2014. This Executive Instrument 146 empowers the Minister of Finance to affix Excise Tax Stamps on certain class of goods. The Minister of Finance may also from time to time prescribe that goods be added or goods be delisted from the class of goods which are subject to the application of E.I. 146. The E.I. 146 will allow Excise Tax Stamps to be fixed to goods imported into the country. Goods with stamps are those on which duties have been paid.

  The class of goods subject to Excise Tax Stamp are: Cigarettes and other tobacco products, alcoholic beverages whether bottled, canned, contained in kegs for sale or packaged in any other form, non-alcoholic carbonated beverages whether bottled, canned or packaged in any form, bottled water and any other excisable product prescribed by the Minister.
- The DTRD rely on data generated from the Ghana Customs Management System (GCMS) for their audits on Companies and the Self-Employed and this has yielded good results.
- Monitoring of PAYE schedules are being persued in field offices with the view to enhance compliance
- In the case of tax holidays companies are registered with their Tax Identification Numbers as well as the Tax Identification Numbers of their Directors, therefore it will be very difficult for the Directors to form a new company after the tax holiday.
- A Ghana Revenue Authority (GRA) Tax Expenditure Committee report recommended that:

  The ministry of Finance should initiate and develop Tax Incentives Act, that streamlines the tax incentive and governance structure for application, granting, monitoring and withdrawal of the regime

  GRA to constitute an oversight committee whose core function is to monitor the administration of use of tax incentives.

  The practice of clearance under permit awaiting parliamentary approval should be well structured and Ministry of Finance should ensure its approval.

  To renegotiate the several tax exemptions of the Mining Companies

  To request NGOs and all Charitable Organizations to re-apply for tax exempt status on yearly basis with their audited financial statement and a certified record and their action plan by the appropriate sector Ministry.

- Commodity valuation will be improved
- There will be improvement in the quality of examination by Customs Officers
- Premises examination of goods will be controlled.
- Strengthening of Post Clearance Audit through improved and effective risk management.
- Streamlining the commodity scan process.
- Improvement in Bonded Warehouse control.
- Improved enforcement of compliance through intelligence.
- Enhancement of the compliance seat at the Port.
- Enforcement of debt collection

7.0 Review of literature, Data Presentation and Analysis

The time series data on the dependent variable (GDP) as well as the explanatory variables namely DTRD Direct Tax, DTRD Indirect Tax and Customs Revenue over a 16 year period (1999-2014) is presented in Table 2.

Table 2: GDP and Government Collected Tax Revenue

	DTRD (DIRECT)	DTRD (INDIRECT)	CUSTOMS	TAX REVENUE	GDP
1999	80.93	48.30	152.13	281.36	2,428.00
2000	128.59	59.98	221.99	410.56	2,715.30
2001	181.67	76.28	303.67	561.62	3,807.10
2002	264.23	109.01	439.39	812.63	4,886.24
2003	453.64	152.80	713.92	1,320.36	6,615.80
2004	579.53	214.11	934.30	1,727.94	7,998.00
2005	681.32	280.08	1,131.80	2,093.20	9,726.06
2006	734.11	354.80	1,281.91	2,370.82	18,705.10
2007	924.99	466.46	1,651.84	3,043.29	23,154.40
2008	1,209.29	611.58	1,930.03	3,750.90	30,178.60
2009	1,798.30	754.01	2,083.20	4,635.51	36,867.40
2010	2,447.24	1,061.22	2,442.15	5,950.61	46,232.00
2011	3,746.07	1,367.64	3,604.82	8,718.53	56,828.00
2012	5,403.03	1,650.43	4,689.73	11,743.19	69,771.85
2013	5,900.06	1,888.70	5,372.43	13,161.19	80,338.43
2014	7,621.57	2,638.11	6,865.21	17,124.89	92,258.12

Source: Ghana Revenue Authority and Ghana Statistical Service

Gross Domestic Product, the dependent variable or regressand is a function of Tax Revenue the independent variable or regressor which is stated in the form Domestic Tax Revenue (Direct), Domestic Tax Revenue (Indirect) and Customs Revenue.

The Ordinary Least Square was used to explore the relationship between GDP and Tax Revenue. The GDP deflator was used to get variables in real form and logarithms were applied to obtain equations in linear form

In the form of an equation

GDP = f (Tax Revenue) or

$GDP = f\,(DTRD_{DIRECT\ TAX}, DTRD_{INDIRECT\ TAX}, CUSTOMS_{REVENUE})$

In the linear form the above equations coverts to

$GDP = \beta_0 + \beta_1\,(TAX\ REVENUE) + \xi$ or

$GDP = \beta_0 + \beta_1\,(DTRD_{DIRECT\ TAX}) + \beta_2\,(DTRD_{INDIRECT\ TAX}) + \beta_3\,(CUSTOM_{REVENUE}) + \xi$

Where GDP = Gross Domestic Product

$DTRD_{DIRECT\ TAX}$ = Domestic Tax Revenue Division Direct Revenue

$DTRD_{INDIRECT\ TAX}$ = Domestic Tax Revenue Division Indirect Revenue

$CUSTOMS_{REVENUE}$ = Customs Revenue

β_0 = Intercept

β_1, β_2, β_3 = Coefficients

ξ = Stochastic disturbance (error) term

Human behaviour is being modeled and thus it is important to add an error term because of:

- Measurement of errors
- Omitted variables in specification
- Theoretical equation has a non-linear functional form
- Random shocks that may alter behaviour

An EViews 7 Statistical software was used in the computation of all the variables in Table 3.

Table 3: Results of Multiple Regression

OBS	DTRDD	DTRDI	CUSR	TREV	GDP	GDPD
1999	80.93	48.3	152.13	281.36	2,428.00	415.2
2000	128.59	59.98	221.99	410.56	2,715.30	528.05
2001	181.67	76.28	303.67	561.62	3,807.10	710.65
2002	264.23	109.01	439.39	812.63	4,886.24	872.42
2003	453.64	152.8	713.92	1,320.36	6,615.80	1,122.32
2004	579.53	214.11	934.3	1,727.94	7,998.00	1,283.64
2005	681.32	280.08	1,131.80	2,093.20	9,726.06	1,476.17
2006	734.11	354.8	1,281.91	2,370.82	18,705.10	1,664.48
2007	924.99	466.46	1,651.84	3,043.29	23,154.40	1,894.98
2008	1,209.29	611.58	1,930.03	3,750.90	30,178.60	2,215.68
2009	1,798.30	754.01	2,083.20	4,635.51	36,867.40	2,437.25
2010	2,447.24	1,061.22	2,442.15	5,950.61	46,232.00	2,669.28
2011	3,746.07	1,367.64	3,604.82	8,718.53	56,828.00	2,901.51
2012	5,403.03	1,650.43	4,689.73	11,743.19	69,771.85	3,153.94
2013	5,900.06	1,888.70	5,372.43	13,161.19	80,338.43	3,447.26
2014	7,621.57	2,638.11	6,865.21	17,124.89	92,258.12	3,998.82

NOTE:
DTRDD DOMESTIC TAX REVENUE (DIRECT)
DTRDI DOMESTIC TAX REVENUE (INDIRECT)
CUSSR CUSTOMS REVENUE
TREV TAX REVENUE

GDP GROSS DOMESTIC PRODUCT
GDPD GDP DEFLATOR
LRDTRDD =LOG (REAL DTRDD)
LRDTRDI =LOG (REAL DTRDI)
LRCUSR =LOG (REAL CUSR)

VARIABLE	CORRELATION COEFFICIENT
GDP	1
TAX REVENUE	0.986106
CUSR	0.987274
DTRDD	0.979067
DTRDI	0.989335

Correlation Coefficient measures the degree of association between the dependent and the independent variables. It ranges in value from +1, representing perfect positive correlation, to -1, representing perfect negative correlation. Positive correlation means that as the independent variable increases or decreases so does the dependent variable. Negative
correlation means that as the independent variable increases, the dependent variable decreases. In Table 3, the correlation coefficient between GDP and all the independent variables are almost perfect – the correlation coefficients are closer to +1:

- GDP and GDP = 1
- TAX REVENUE and GDP = 0.986106 (0.013894 away from +1)
- $DTRD_{DIRECT\ TAX}$ and GDP = 0.979066 (0.020934 away from +1)
- $DTRD_{INDIRECT\ TAX}$ and GDP = 0.989334 (0.010666 away from +1)
- $CUSTOMS_{REVENUE}$ and GDP = 0.987274 (0.012726 away from +1)

The results reveal a strong relationship between Gross Domestic Product and Tax Revenue
GDP = f (Tax Revenue)
GDP= $\beta_0 + \beta_1$ (TAX REVENUE) + ξ

Dependent Variable: LRGDP
Method: Least Squares
Date: 04/25/15 Time: 21:28
Sample: 1999 2014
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LRTREV	0.943492	0.09064	10.40928	0
C	1.895621	0.068145	27.8176	0
R-squared	0.885577	Mean dependent var		2.359661
Adjusted R-squared	0.877404	S.D. dependent var		0.588797
S.E. of regression	0.20616	Akaike info criterion		-0.203864
Sum squared resid	0.595025	Schwarz criterion		-0.10729
Log likelihood	3.63091	Hannan-Quinn criter.		-0.198918
F-statistic	108.3531	Durbin-Watson stat		0.747972
Prob(F-statistic)	0			

R^2 measures the overall fit of the regression line, in the sense of measuring how close the points are to the estimated regression line in a scatter plot. $R^2 = 1$ means the regression fit the data perfectly and $R^2 = 0$ means the regression is no better than guessing the sample mean.
"Adjusted R squared" makes an adjustment to R^2 to take account of right hand side variables in the regression. When you add another right hand variable to a regression R^2 always rises. The adjusted R^2 subtracts a small penalty for each additional variable added.
$R^2 = 0.885577$ means our regression accounts for 88.56% of the variance in GDP and the estimated standard deviation of the error term (S.E. of regression) is 0.20616. A strong relationship exists between GDP and Tax Revenue simply because for a time series data adjusted $R^2 > 0.8$ is acceptable.
"*F*-statistic" and "Prob(F-statistic)" come as a pair and are used to test the hypothesis that none of the explanatory variables actually explain anything. If $F > 4$: coefficients are jointly significant. The result above shows that F-statistic equals 108.35, therefore the coeffients are jointly significant.
Put more formally, the "*F*-statistic" computes the standard *F*-test of the joint hypothesis that all the coefficients, except the intercept, equal zero.
The t-statistic and the F-statistic test exactly the same hypothesis. F is exactly the square of the t.

Therefore if $t=10.40928$ then $F=t^2= (10.40928)^2=108.3531$
t-statistic*s* and *p*-values are different ways of looking at the same issue. A *t*-statistic of 2 corresponds (approximately) to a *p*-value of 0.05.

"Durbin-Watson," the classic test statistic for serial correlation.
A Durbin-Watson close to 2.0 is consistent with no serial correlation, while a number closer to 0 means there probably is serial correlation. The "DW," as the statistic is known, of 0.747972 in the equation is a very strong indicator of no serial correlation.

Five other elements, "Sum squared residuals," "Log likelihood," "Akaike info criterion," "Schwarz criterion," and "Hannan-Quinn criter." are used for making statistical comparisons between two different regressions. This means that they don't really help us learn anything about the regression we're working on; rather, these statistics are useful for deciding if one model is better than another. For the record, the sum of squared residuals is used in computing *F*-test*s*, the log likelihood is used for computing likelihood ratio tests, and the Akaike and Schwarz criteria are used in Bayesian model comparison.

The next two numbers, "Mean dependent var" and "S.D. dependent var," report the sample mean and standard deviation of the left hand side variable.

$GDP = f\,(DTRD_{DIRECT\ TAX}, DTRD_{INDIRECT\ TAX}, CUSTOMS_{REVENUE})$

$GDP = \beta_0 + \beta_1\,(DTRD_{DIRECT\ TAX}) + \beta_2\,(DTRD_{INDIRECT\ TAX}) + \beta_3\,(CUSTOM_{REVENUE}) + \xi$

Dependent Variable: LRGDP
Method: Least Squares
Date: 04/25/15 Time: 21:26
Sample: 1999 2014
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LRCUSR	-0.176107	0.286088	-0.615568	0.5497
LRDTRDD	-0.330539	0.227218	-1.454722	0.1714
LRDTRDI	1.437334	0.216755	6.631148	0
C	4.192487	0.224644	18.66278	0

R-squared	0.971721	Mean dependent var		2.359661
Adjusted R-squared	0.964651	S.D. dependent var		0.588797
S.E. of regression	0.110702	Akaike info criterion		-1.35163
Sum squared resid	0.147059	Schwarz criterion		-1.158483
Log likelihood	14.81304	Hannan-Quinn criter.		-1.341739
F-statistic	137.4455	Durbin-Watson stat		1.959018
Prob(F-statistic)	0			

Source: Author's Computations

$R^2 = 0.971721$ means 97.17% of the variance in GDP is explained by DTRD DIRECT TAX , DTRD INDIRECT TAX and CUSTOMS REVENUE. Adjusted R-squared is also 96.47% of the variance in GDP. A very strong relationship exists between GDP and the components of Tax Revenue because for time series data like this adjusted $R^2 > 0.8$ is acceptable.

F-statistic equals 137.45 which means the coefficients are jointly significant
DW = 1.959 means there is no serial correlation
Results from the computation show that Tax Revenue is closely related to GDP and has a positive effect on the economic development of Ghana. The null hypothesis is therefore rejected.

8.0 Conclusion

Ghana, some years back was considered a Low Income Country and thus received donor support for her budget. Now that she has a Low Middle Income status, the donor support has dried up. The country at the moment is experiencing declining Oil, Cocoa and Gold prices which are having a negative effect on the mobilization of foreign exchange to finance deficits. The country has borrowed a lot to support her infrastructure development. The country's total public debt as at December 2014 stood at GH¢76.1billion (representing 67.6% of GDP) from the GH¢51.9billion recorded in December 2013. Total domestic debt amounted to GH¢34.6billion while total external debt stood at GH¢41.5billion as at end of last year.

The IMF recently approved a $918 million bailout package for Ghana but there appears to be a hedge position the IMF has taken in order not to be the loser in the final analysis when the government has failed on implementation, given that elections are just a year away.

Among the fiscal (government expenditure) adjustments, the government is expected to cut fiscal deficit drastically, increase domestic tax revenues, abolish subsidies, cut public sector wages and salaries, while the central bank is expected not to finance budget deficit at all. These will be very difficult to implement. On the other hand, the IMF's support will all come at later dates after the government has achieved those challenging targets, except for US$114.8 million it delivered a fortnight ago. The amount is about 12 per cent of the entire US$918 million bailout package.

This shows that even though Tax Revenue is doing well now, more is expected to support economic development.

The government with the support of Her Majesty Revenue and Customs UK is conducting a study to estimate the Tax Gap for Ghana. This will help the Ghana Revenue Authority to know the portion of Tax Revenue that is left uncollected.

The government is commended for introducing a new Special Petroleum Tax which a VAT on petroleum products to shore up Tax Revenue.

Progress has been made in addressing corruption. It requires strong leadership (political and managerial), institutional measures—strong and proactive internal audit and staff investigation functions, visible implementation of a code of ethics (including prosecutions)—and processes that limit rent-seeking opportunities (minimizing contact between taxpayers and tax officials). In the Ghana Revenue Authority, we have a strong leadership and an Internal Affairs Department with investigative functions and overseeing the implementation of the code of ethics.

The Ghana Revenue Authority is in the process of stamping out tax evasion and avoidance by companies and individuals taxpayers whose business operations extend beyond Ghana. This will be achieved through tax transparency and information sharing between Ghana and other countries where the companies and individuals operated based on request. With all the problems that transfer pricing and based erosion and profit shifting poses to tax administration, it has become imperative to put in place an effective mechanism that plugs the loopholes and prevents tax avoidance and evasion. (George Blankson, Commissioner-General of the Ghana Revenue Authority, 2015).

To ensure that corporate bodies and individuals lived up to their tax obligations, Ghana has invested resources in signing a number of multilateral conventions and tax information agreements. Additionally, Ghana had passed a transfer pricing regulation and also established a unit for transfer pricing audits in order that corporate bodies and individuals pay the right amount of tax at the right time in the right place. (George Blankson, Commissioner-General of the Ghana Revenue Authority, 2015).

To check smuggling, the government has passed a law (Excise Tax Stamp Act 2013, Act 873) and an Executive Instrument came into force on 9th December, 2014. This Executive Instrument 146 empowers the Minister of Finance to affix Excise Tax Stamps on certain class of goods. The Minister of Finance may also from time to time prescribe that goods be added or goods be delisted from the class of goods which are subject to the application of E.I. 146. The E.I. 146 will allow Excise Tax Stamps to be fixed to goods imported into the country. Goods with stamps are those on which duties have been paid.

A Ghana Revenue Authority (GRA) Tax Expenditure Committee report recommended that:

- The Ministry of Finance should initiate and develop Tax Incentives Act, that streamlines the tax incentive and governance structure for application, granting, monitoring and withdrawal of the regime
- GRA to constitute an oversight committee whose core function is to monitor the administration of use of tax incentives.
- The practice of clearance under permit awaiting parliamentary approval should be well structured and Ministry of Finance should ensure its approval.
- To renegotiate the several tax exemptions of the Mining Companies
- To request NGOs and all Charitable Organizations to re-apply for tax exempt status on yearly basis with their audited financial statement and a certified record and their action plan by the appropriate sector Ministry.

In addition to the above, upfront exemptions will be replaced by a Tax Credit System for entities benefiting from exemptions. Under the Tax Credit System, exempted entities will pay all import duties and taxes in full and apply for a Tax Credit Note which will be used to offset future tax liabilities.

To increase the Domestic VAT the government is in the process of introducing electronic point of sales devices which will be linked to servers at the GRA to help in compliance and audit. In addition to the devices, enforcement measures will also be put in place to enhance VAT collection.

In November 2012, the government of Ghana introduced a sliding scale excise duty on beer and malt. This has led a decline in domestic excise revenue The policy involves the usage of local raw materials such as cassava, sorghum, etc in the manuacfacture of beer and excise is paid at reduced rates. This year government will review the policy to ensure greater efficiency and compliance by the beneficiaries to increase domestic excise.

If the above measures are implemented more tax revenue will be generated to reduce government budget deficit.

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