INFORMATION COMMUNICATION TECHNOLOGY AND TAX ADMINISTRATION IN NIGERIA: THEORETICAL AND DESCRIPTIVE ANALYSIS

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ABSTRACT
This paper undertook a theoretical and descriptive analysis of the relationship between information communication technologyand tax administration in Nigeria using a time series annual data between the period 1981 and 2015.This was meant to bring to fore the relationship between information communication technology and tax revenue as well as the extent to which information communication technology has been employed in tax administration in Nigeria. The study revealed that information communication technology has a positive relationship with tax revenue but has not been maximally employed in tax administration in Nigeria as evidenced by tax compliance indicator. It was then recommended among others that for tax administration to be efficient and effective in Nigeria, government should engage the services of tax consultants as well as ensure the provision and utilization of up to date information communication technology soft and hard-wares by its relevant tax agencies

Keywords: Technology, Tax, Nigeria
JEL Classification:O30,H21, O55

1. Introduction
All over the world, government relies largely on revenue accruing from various forms of taxes to meet up with the developmental needs of the country and its citizens (Omesi and Nzor, 2015).Taxation helps to coordinate and direct the path of economic activities and such roles are referred to as the effect of taxation (Raymond, Adigwe and Echekoba, 2015). The use of information communication technology (ICT)in tax administration benefits both tax authorities and taxpayers (Taiwo, 2013). In view of the perceived benefits of the use of ICT in tax administration, most developed economies had being leveraging and advancing on it. ICT creates easy platform for the performance of various acts such as complaints by tax payers without necessarily visiting the tax office and updating of tax profile and records. For example, in Canada, the Revenue Canada Taxation (RCT) make use of the tax information phone service (TIPS) to get

information about selected tax topics, status of income tax refunds, registered retirement savings plan contribution limit, and eligibility for payments like credit for goods and services tax paid (Amaresh, 1993).

Matthew (2004) initially opined that tax revenue mobilization in Nigeria has been bedeviled with various factors ranging from high rate of tax evasion and tax avoidance, corrupt and sharp practices of tax administrators, crude tax administration to mention just a few. Also, Central Bank of Nigeria (CBN) (2010) held that tax revenue in Nigeria account for a small proportion of total government revenue over the years. This was attributed to the fact that less attention is paid to tax revenue generation due to the fact that over 80 percent of the total revenue of the country for developmental purposes is derived from crude oil export with just about 20 percent contribution from non-oil sector.

However, in the light of the perceived and observed benefits emanating from the employment of electronic system/information communication technology in tax administration as evidenced in most advanced countries, this paper seeks to evaluate the extent to which relevant tax agencies in Nigeria employ/utilize information communication technology in tax administration. This will also helps bring to fore steps taking thus far by the Nigeria governmental relation to the use of modern information technology in improving its tax administration and revenue.

2. Background Issues

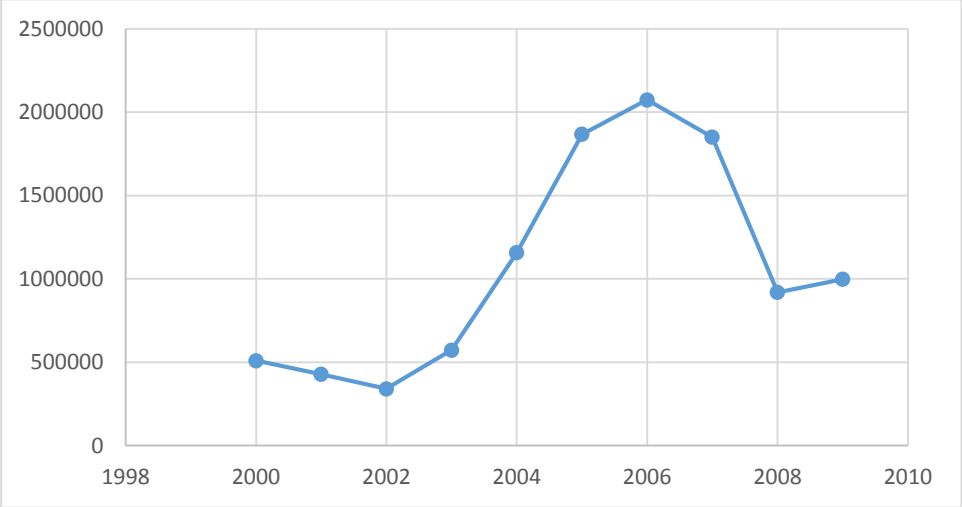
Tax system in most developing countries is characterized by tax structures that are usually not in tune with international best practices. Most of these countries are bedeviled with ineffective tax policy management, low compliance levels and weak tax administration ability (ITC, 2010). Richard (2010) opined that the way a tax system is administered affects its yield, its revenue and its efficiency. He opined further that an unserious government brings the tax system into disrepute and weaken its legitimacy. Omorogiuwa (1981) had also earlier upheld this view when he stated that ineffective tax administration is the main factor responsible for large scale tax evasion in Nigeria.Aguolu (2004) opined that taxation is not the only source of revenue to the government, but in terms of reliability, it is the most important source of revenue to the government. This is because an effective tax system usually ensures that revenue is available for government programmes and projects.

However, over the years there has been a decreasing trend in tax revenue to GDP in Nigeria. For example, in 2010 the tax revenue to GDP was about 2.3 percent, it fell to about 1.8 percent in 2011, 1.6 percent in 2012 and 1.5 percent in 2013 (World Bank, 2016). The total tax revenue collected by the Federation in 2015 was about US$27.5bn compared to about US$57bn recorded by South Africa (Taiwo, 2016). World Bank (2016)data on tax revenue as percentage of GDP revealed that Mauritius which is a smaller country in terms of population and economic size compared to Nigeria recorded tax revenue to GDP of about 17.9 percent, 17.9 percent, 18.5 percent and 18.3 percent in 2010, 2011, 2012 and 2013 respectively. This is indeed a huge gap when compared to the amount/percentages generated by Nigeria within same period.

2.1. Trends in some major Tax Revenue Sources

To give clearer view of the background issues, trends in some specific tax revenue contributors to the Nigeria economy between year 2000 and 2009 are analyzed. These includes; Petroleum Profit Tax, Company Income Tax and Value Added Tax (VAT).

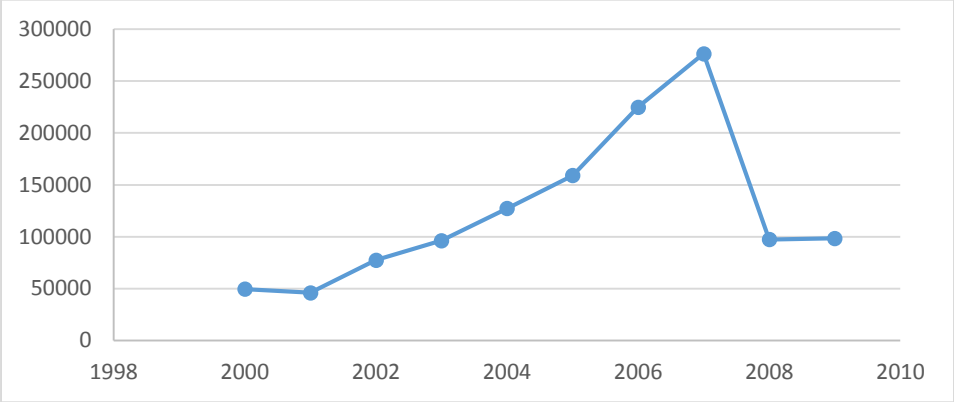
Figure 2.1 Trends of Petroleum Profit Taxes Revenue between 2000 and 2009



Source: CBN Annual Report and Statement of Account 2010

Figure 2.1 shows the trend in Petroleum Profit Tax (PPT) revenue from 2000-2009. A cursory look at Figure 2.1 revealed a decreasing trend in the revenue from PPT during this period. For example, in 2000 the value of PPT stood at about N510 million and thereafter decreased to about N428 million in 2001. Figure 2.1 further show that PPT decreased once more to about N340 million in 2002 before it recorded an increased of about N573 million in 2003 and continued on this upward trend till it got to its peak in 2006 with a value of over N2 billion. However, after this period, there was a sustain fall to the tune of less than N1 billion in 2008 before it recorded a marginal gain in 2009. This fluctuating and often downward trend in PPT revenue generation is attributed to the vagaries that usually accompany the high but often fluctuating revenue accruing to relevant players in the Nigeria petroleum industry. This could also be linked to the negative impacts of the activities of various Niger Delta Militants groups in most of the oil producing regions whose activities was conspicuous during this period necessitating the granting of amnesty by the Nigeria government, poor tax revenue generating capacity of relevant tax agencies among others.

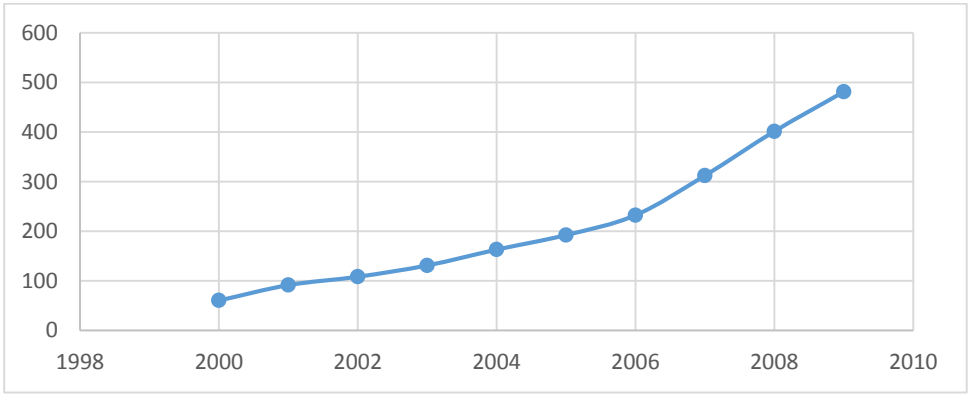
Figure 2.2 Trends of Company Income Tax Revenue between 2000 and 2009



Source: CBN Annual Report and Statement of Account 2010.

In same vein, Figure 2.2 shows the trends in Nigeria Company Income Tax (CIT) from 2000-2009. The figure reveal that there was a slight decrease in the revenue generated from CIT between 2000 and 2001. However, CIT revenue increased from about N46 million recorded in 2001 to about N77 million in 2002. This increase was sustain till it got to it its peak in 2007 with about N276 milllion before it decline tremendoustly to about N100 million in 2008 and 2009. Also, some of the reasons adduced for this huge fall in CIT revenue in Nigeria is the high level of tax evasion and tax avoidance resulting from the partial and/or non utilisation of information and telecommunication technology, corrupt practices on the part of tax administrators and non remittances of tax revenue by relevant government agencies among others.

Figure 2.3 Trends of VAT Revenue from 2000-2009



Source: The Economist Nigeria, 2013

Also, Figure 2.3shows the trend in VAT generated from 2000 to 2009 in Nigeria. A cursory look at the figure shows that revenue accruing from VAT between 2000 and 2009 was relatively stable and on a steady increase.Specifically, VAT generated about N60.7billion, N91.8billion, N108.6billion, N131.4billion and N163.3billion in the year 2000, 2001, 2002, 2003 and 2004 respectively. This Upward increase in VAT was sustained with about N481.4billion recorded in

2009. The major reasons attributed for this upward increase in VAT generated over the years in Nigeria is that it does not have a high propensity of being evaded and avoided due to the fact that its burden is usually shifted and/or shared by both producer and the final consumer by way of increase in the prices of goods and services.

3. Literature Review

3.1 Conceptual Issues

A tax is a liability imposed on individuals, groups of individuals, or other legal entities (Oriakhi, 2002).Olaoye (2008) opined that taxes are compulsory levy imposed by government on individuals and companies to ensure the smooth running of the legitimate function of the state. Also, Ojo (2003) observes that tax is a necessary ingredient for civilization. This is because human history has shown that man has being paying tax either in cash or in kind to his monarch/head/chieftain and organized government. Dalton (in Burgess, 1993), opined that a tax is a compulsory contribution imposed by a public authority irrespective of the exact amount of service rendered to the tax payer in return and not imposed as penalty for any legal offence. Ogundele (1999), defined taxation as the process or machinery by which individuals andgroups of persons are made to pay some amount of money for the purpose of the smooth administration and development of the society. Soyode and Kajola (1997), describes tax as a compulsory exaction of money by a public authority for public purposes. In corroboration, Markodi and Nobert (2015) opined that taxation leads to the reduction of the spending potential of the private sector and an increase in the spending potential of public sector. They opined further that government uses taxation to exact money from households and organizations through the use of laws.

3.2. Determinants of Tax Revenue

Tax revenue plays major role in the economic of both developed and developing countries. It is the most reliable source of government revenue which helps government to meet the needs of the society. Over the years, researchers have revealed several variables such as per capita GDP,sectoral composition of output, the degree of trade and financial openness, the ratio of overall debt to GDP, a measure of the informal economy, use of information communication technology in tax administration amongst others as potential determinants of tax revenue performance (Gupta, 2007).

Beside per capita income being a good proxy for the overall growth of the economy, it is also expected to be positively correlated with tax share. This is because a vibrant economy usually results in better rewards to factors employed in the course of production and by extension translate to improve tax revenue (most especially where the tax system is progressive). The sectoral composition of an economy is also a good determinant of revenue generation for an economy this is because certain sectors of the economy are easier to tax than others. For example, the agriculture sector may be difficult to tax, especially if itis dominated by a large proportion of subsistence farmers whereas, a vibrant mining sector dominated by a few large firms can generate huge tax surpluses for the economy. The degree of international trade measured by the share of exports and

imports is another good determinant oftax revenue performance in an economy. Imports and exports are amenable to tax as they take place.The degree of external indebtedness of a country also affects tax revenue performance and in other to generate the necessary foreign exchange to service debt a country may need to reduce its imports. In such situation, import revenue through taxes will fall.

In the quest to investigate the determinants of tax revenues, Amir, Nasir, Hussain and Butt (2011) employed two simple regression lines for Pakistan and India. Total revenue of both countries was taken as dependent variable and direct and indirect taxes were taken as independent variables. They found that more revenue was generated through indirect taxesin Pakistan, while it was the opposite in India. Pakistan has a favorable policy for employing indirect taxes whereas India generates more of its revenue through direct taxes. They further revealed that Pakistan tax-to-GDP ratio was about 10.2 percent withabout 60 percent of the economy outside the tax net (Amir, Nasir, Hussain and Butt, 2011).

Ahmed and Mohammed (2010) investigated 25 countries cross section data for the year 1998 to 2008 and used pooled least square method for result analysis. Their result shows that import, manufacturing sector, services sector, monetization and budget deficit positively influence tax buoyancy while increases in grants negatively impact on tax buoyancy. They also held that growth in agriculture sector has insignificant impact on tax buoyancy in developing countries because they are usually either under taxed or not taxed. Unlike many of the past studies which found insignificant impact of service sector on tax buoyancy, this study found a positive and significant impact of service sectoron tax buoyancy due to the development of service sector in the focus countries investigated.

Amaresh (1993) opined that the advent of microcomputers and vast communication networks has radically transformed the world of tax administration globally.It revealed further that there was a huge improvement in the processing of tax and its related administrative task with ease and at affordable costs. Glenn (1996) also acknowledges that the advancements of microcomputers technologies and local area networks as well as the widespread use of sophisticated computer software have enabled tax administrators to be more efficient in their overall tax functions. Gekonge and Wallace (2016) observes that after the introduction of electronic tax systems by the Tanzania Revenue Authority, there was a complete departure from manual posting of entries in the ledger to the use of computers in tax administration and this impacted positively in the amount of tax income generated.

Glenn (1996) study on tax reforms in three countries Canada, Spain and Mexico observes that modern information technology systems were introduced for a more efficient tax administration. In the case of Spain and Mexico, comprehensive tax reforms were implemented covering the legal and administrative aspects of tax reforms(from income tax to customs tax). In Canada, the conversion of the obsolete federal manufacturing sales tax system into a comprehensive VAT was accompanied by a complete reorganization of the tax administration and the introduction of modern information technology. The study revealed further that information technology has

helped to increase the quality and quantity of information available to the tax administration and this has resulted in increase in tax revenue.

4. Theory of Taxation

Over the years, numerous theories have been put forward to explain tax system and its rationale. Some of these theories are benefit theory, cost of service theory and ability to pay theory.

The benefit theory holds that the government should levy taxes on individuals according to the gain such individual or entity derive from government services. In other words, this theory holds that the more benefits a person derives from the activities of the government, the more tax he should be levied.

The cost of service theory hold the view that taxes should be levied base on the actual cost of service rendered. This is to ensure that there is fairness in tax administration. However, it is difficult if not impossible to determine and apportion taxes base on the quantity and volume of service enjoyed by the individuals or corporate entity with respect to public goods such as defense and road. This thus makes this theory practically difficult to operate.

Ability to pay theory is the most popular and commonly accepted theory of taxes. This is because it holds that individuals should be taxed base on and in accordance with their ability to pay (Adam, 1776). This therefore means that the economic power of an individual or corporate entity determines the amount to be levied and paid as tax.This theory is also explained in the context of sacrifice. Here, it is held that progressive taxation can be justified under any of the three possible interpretations of sacrifice of the equal, equal proportional, and least sacrifice theories. The assumptions of these theories are; declining marginal utility of money with an increase in supply, existence of sacrifice arising from the payment of taxes and the quantitative expression of that sacrifice. Slade (1939) stated that money for public expenditures in form of taxes should emanates from 'him that hath' instead of from 'him that hath not'. Slade (1939) stated further that the usual and main justification of ability to pay should be based on the grounds of sacrifice. This idea of sacrifice when linked to the concept of the declining marginal utility of money is what gave rise to the three theories of progressive taxation of the equal, equal-proportional and least sacrifice theories.

4.1. Theory of Tax Structure Development

The issue of tax structure deals with the composition of taxes. Over the years, various theoretical analysis to tax structure development have emerged. One of such is that which shares a typical tax structures between early and later period. The argument here is that the basic determination of tax structure at the early period of the economy's development is the prevailing tax bases. At this period, agriculture was typically predominant in the economy and given the difficulty of imposing and collecting agricultural taxes, for example, income tax, focus was then shifted to land taxes as the major element of tax structure. Henricks (1966) opined that during this stage, there existed limited scope for the use of direct taxes. This is because the majority of the people who resides in the rural areas engage in subsistence agriculture and their incomes difficult to assess. Musgrave

(1969) opines that there is absence of industries at the early stage of development and as such excise tax yielded little or no revenue.

Also, Anyawu (1997)in explaining tax structure development sketched the pattern of tax structure change from primitive to advanced societies. He opined further that at the first stage, traditional societies rely mainly on non-tax sources such as fees or levies from state monopolies and/or traditional direct taxes such as taxes on land, livestock heads, agricultural output and water rights. The second stage is when the society begins to break away from old ways and indirect taxes begins to have relevance, for example, taxes on foreign trade and taxes on corporate organization. At the third stage, traditional indirect taxes declined relatively to national income and government revenue as a result of the establishment of more corporate organization and international trade. The fourth stage comprises a situation where in domestic production and monetization continues to expand while taxes such as sales and excise taxes grew rapidly. The fifth and final stage is where modern direct taxes such as personal income and company income taxes become predominant.

5. Methodology and Analysis

Most developing countries inclusive of Nigeria do not have comprehensive data on taxes due to the crude nature of their tax administration. However, this study employed time-series annual data from two relevant secondary sources in Nigeria namely; Nigerian Bureau of Statistics (NBS) and Federal Inland Revenue Service (FIRS) for the period 1981 to 2015. The analysis and inferences emanating from it are presented below.

Descriptive statistics show the summary of data and other basic characteristics within the series. Table 5.1 shows the descriptive statistics of Real Gross Domestic Product per capita (RPC), Information Communication Technology (ICT), Tax Revenue (TR), Agriculture as a percentage of GDP (AGR), Trade Openness (OPN) and Government Expenditure (GE).

Table 5.1 : Descriptive Statistics

Statistics	*RPC*	*ICT*	*TR*	*AGR*	*OPN*	*GE*
Mean	865.35	1846.46	715.41	32.69	51.13	1421.47
Median	377.50	141.96	166.00	32.76	53.03	487.11
Maximum	3080.32	10781.08	2950.60	48.57	81.81	5185.32
Minimum	153.08	23.20	3.00	20.24	21.45	9.64
Std. Dev.	903.11	3106.67	980.20	6.76	16.59	1768.14
Skewness	1.45	1.67	1.30	-0.12	-0.23	1.05
Kurtosis	3.59	4.42	3.30	2.72	2.07	2.56
Jarque-Bera	12.72	19.11	10.03	0.19	1.55	6.68
Probability	0.00	0.00	0.01	0.91	0.46	0.04
Sum	30287.18	64625.98	25039.40	1144.19	1789.40	49751.57
Sum Sq. Dev.	27730847.00	328000000.00	32666852.00	1553.57	9353.01	106000000.00
Observations	35.00	35.00	35.00	35.00	35.00	35.00

Source: Author's computation using Eviews 9.

A cursory look at Table 5.1 shows that RPC, ICT, TR and GE have a more impressive statistics compared to AGR and OPN. Specifically, the averages for RPC, ICT, TR and GE had high values indicative of a sustained long-run impact over time. The standard deviations are relatively high and this suggests high level of variation in each of the variables. The skewness is also relatively low indicating that the RPC for each of the variables lies to the right of the mean value. The J-B value is relatively high for most of the variables and passes the significance test at the 1 percent level. This indicates that the density function of the series is not normally distributed.

Table 5.2: Correlation Matrix

Variables	RPC	ICT	TR	AGR	GE	OPN
*RPC**	1.00					
ICT	0.97	1.00				
TR	0.96	0.98	1.00			
AGR	-0.75	-0.71	-0.68	1.00		
GE	0.95	0.95	0.98	-0.65	1.00	
OPN	-0.33	-0.34	-0.21	0.14	-0.15	1.00

**** dependent variable***

Source: Author's computation using Eviews 9.

Table 5.2 shows the correlation matrix between RPC andICT, TR, AGR, GE and OPN.The result revealed a strong positive correlation between RPC and ICT, TR and GE while there was a negative correlation between RPC and AGR, OPN. This affirms thatInformation and Communication Technology positively influence Tax Revenue and by extension economic growth.

Table 5.3: Correlation Matrix

Variables	TR	ICT	PC	GE	OPN	AGR
TR*	1.00					
ICT	0.95	1.00				
RPC	0.70	0.86	1.00			
GE	0.99	0.94	0.67	1.00		
OPN	0.31	0.07	-0.22	0.32	1.00	
AGR	-0.50	-0.58	-0.72	-0.48	0.16	1.00

**** dependent variable***

Source: Author's computation using Eviews 9.

Table 5.3 shows the correlation matrix when the dependent variable is Tax Revenue (TR). The result from the correlation matrix in Table 5.3 revealed a positive relationship between tax revenue (TR) and ICT, RPC, GE, and OPN. The highest positive relationship was between TR and GE with about 0.99 followed by TR and ICT with about 0.95 correlation values. The high positive link

between TR and ICT is again a pointer to the fact that the utilization of information communication technology in tax administration has a high propensity for increased tax revenue. It was further revealed that there was a low relative relationship between TR and OPN, RPC as well as a negative relationship between TR and AGR. Thisnegative relationship between TR and AGR could however be attributed to the difficulty faced by tax administrators in imposing taxes on agriculture products/income. This often accounts for its low contribution to tax revenue in the country.

5.1. Tax compliance indicators

Tax compliance indicator shows the time it takes for a statutory tax duty to be carried out. In other words, it is the time it takes for a tax obligation to be carried out as it falls due. A lesser time is an indication of an efficient tax system driving by ICT.

Table 5.4 shows the Total Tax Time (TTT) to comply recorded in hours per year. The sub-indicator measures the time taken to prepare, file and pay three major types of taxes and their contributions vis-a-vis Corporate Income Tax Time (CITT), Labor Tax Time (LTT) and Consumption Tax Time (CTT) (Paying taxes, 2016). Here, selected countries are group into low income countries(Niger and Benin), middle income countries(Ghana and Libya)and High income countries (South Africa and Mauritius). A cursory look at Table 5.4 revealed thatthe TTT to comply is higher in Nigeria when compared to the other countries for CITT, LTT and CTT. Specifically, it takes about 908 TTT in Nigeria compared to about 152 TTT, 203 TTT, 224 TTT and 270 TTT in Mauritius, South Africa, Ghana and Niger respectively.

Table 5.4 Tax Compliance Indicator among Income Groups in Africa (2004-2015)

Countries	TTT	CITT	LTT	CTT
Nigeria	908	378	379	151
Low Income				
Niger	270	30	120	120
Benin	270	30	120	120
Middle Income				
Ghana	224	40	88	96
Libya	889	679	210	0
High Income				
South Africa	203	96	52	55
Mauritius	152	36	48	68

Source: Paying Taxes, 2017.

Specifically, Table 5.4 shows that it takes about 908 TTT in Nigeria compared to about 152 TTT, 203 TTT, 224 TTT and 270 TTT in Mauritius, South Africa, Ghana and Niger respectively. This

is attributed to the fact that these countries has a relatively improve tax system compared to that of Nigeria. It can also be linked to theunder utilization of model technology in tax administration coupled with the increasing tax base in Nigeria compared to these countries. Thenone or under utilization of advanced technology intax administrators result in avoidable complexities in tax filing, preparation and execution. These manifest in various forms such as a longer time to executive a tax function and TTT amongst others.

6. Conclusion and Recommendations

Globally, tax administration had experiencedsubstantial transformation owing to the advent and utilization oftechnological innovations. The worldwide radical tax reforms have lent urgency forthe need to embrace information communication technology (ICT) in tax administration.However, the use of information communication technology (ICT) in tax administration in Nigeria has not yet been fully embraced as evidence in tax compliance indicators in Nigeria. This shows that the reforms made thus far by the Nigeria government in this direction had not been effective. The implication of this is that steps taking thus far by various policies makers towards an efficient and effective tax administration alongside its inherent benefits to the countryare flattery, slow and lacks the necessary political.For example in Enugu State (South-East Nigeria),Agiusiy (2013) observes that tax administration was yet to fully embraced the use of information technology for record keeping as there were overwhelming evidence of high level of manually compiled database of tax payers.This summarizes the actual situation oftax administration in Nigeria.

Thus, for there to be a more vibrant tax administration in Nigeria, there should be an overhauling of the existing weak system for a more efficient and effective administration driven by ICT. In specific terms, the following recommendations should be considered;

- The government should employ the services of tax consultant on a routine basis to help provide tax administrators with the requisite training/skills on the use of ICT in tax administration.
- The government should as a matter of urgency continually ensure the provision of up to date ICT soft and hard-wares apparatus relevant for the effective functioning of tax administration in Nigeria.
- Relevant organs/agencies of government should enact appropriate legislation and embark on a continuous enlightenment of existing and potential tax payers geared towards a more efficient and effective tax administration and tax revenue drive in the country.
- There should be a continuous systematic update/evaluation of tax register so as to widen the tax nest and ensures that tax payers pays correct taxes.

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