

ELECTRONIC TAXATION SYSTEM AND REVENUE GENERATION EFFECTIVENESS IN NIGERIA: A PRE-POST ANALYSIS

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ABSTRACT

Tax administration in Nigeria has continuously been influenced with several loopholes, discrepancies, complications in filing and collection of taxes. Electronic taxes provide the mechanism for the improvement of tax assessment and collection. This study empirically investigated the correlation between electronic taxation and revenue generation in Nigeria. The used three research hypotheses and was anchored on innovation diffusion theory. The study employed ex post facto research design and quarterly time series data from 2012 to 2020. The data collected was analysed using descriptive statistics and pre-post Test. The t-test results showed a significant difference between pre-post electronic company income tax and revenue generation in Nigeria; there is a significant difference between pre-post electronic value-added tax and revenue generation in Nigeria and there is no significant difference between Pre-Post electronic capital gain tax and revenue generation in Nigeria. On the basis of the t-test analysis, the study concluded that there is significant difference between pre electronic taxation and post electronic taxation system on revenue generation effectiveness in Nigeria. Therefore, on the basis of the conclusion, the study recommended amongst others that government should ensure compliance to electronic tax payments system because electronic taxation system in term of company income tax and value-added tax generate more revenue in Nigeria.

Keywords: *Electronic taxes, Company tax, Value Added tax, Revenue Generation*

INTRODUCTION

There has been unparalleled improvement in Information and Communication Technology (ICT) in the last two decades, to the extent that numerous activities that were previously performed by human manually have been taken over by computerized systems (Chiamaka et al, 2021). The adoption of Information and Communication Technology (ICT) increased the expansion in the growth of e-commerce and e-governance including tax administration all over the world due to the use of computer systems and networks in the process of tax registration, filing of tax returns and payment of taxes (Newman & Eghosa, 2019). According to PricewaterhouseCoopers (PWC) (2013), the influence of Information and Communication Technology (ICT) can be seen and felt in every aspect of lives from business to entertainment, education, communications, healthcare, defense and taxation. However, tax administration in Nigeria has continuously been affected with numerous loopholes, discrepancies, complications in filing and collection of taxes (Ofurum et al 2018; Adegbe & Akinyemi, 2020; Onubia et al, 2020; Chiamaka et al, 2021). Most developed countries succeed more in tax revenue drive due to the adoption of electronic tax system (e-taxation) that allows taxpayers to pay tax, file return and receive an assessment from tax authorities without visiting tax offices. In several cases, it has been exposed that this has been one of the factors that contribute to higher tax receipts (Awai & Oboh, 2020; Ofurum et al, 2018; Umenweke & Ifediora, 2016). According to Chiamaka et al (2021), tax authorities skeletally adopt e-taxation as such tax revenue has not recorded significant improvement in Nigeria. According to Adebayo and Idowu (2020), electronic-taxation is an electronic self-service platform that enables taxpayers to file their tax returns and conduct other tax services on-line at their convenience irrespective of their locations once internet is available. Awai and Oboh, (2020)

stated that it covers tax registration, payment, assessment, monitoring, tax audit, investigation, taxpayers file management and returns filing. Wasao (2014) stated that electronic taxation are those online structures where a taxpayer is able to access using the internet all the services offered by a tax authority such as the registration for personal identification number, filing of returns and application for compliance certificate etc. Awai and Oboh (2020), Ofurum et al (2018) noted that electronic tax payment system has demonstrated to be a major instrument in fighting the challenges of any tax system as it provides information, education and support to taxpayer and facilitates tax compliance and administration. It is agreed that the objective of e-taxation is to improve revenue generation in the system. Revenue generation has remained a key concern for several nations including Nigeria. Nnubia et al (2020) noted that the introduction of electronic taxation payment system will bring about an increase in tax revenues, which will in turn bring about an increase in revenues collected as a whole as noticed in various countries of the world after the introduction of e-tax payment system.

The empirical studies on electronic tax system and revenue generation showed different and disaggregated finding such as Onuselogu and Onuora (2021), Chiamaka et al (2021), Oladele et al (2020), Awai and Oboh (2020), Oladele et al (2020), Ofurum et al. (2018), Olurankinse and Oladeji (2018), Olaoye and Atilola (2018), Allahverd et al. (2017), Monica et al. (2017). It remains uncertain the explanations why empirical evidence often showing inconsistent results. These conflicting results revealed that electronic taxation system and revenue generation is still in conclusive. The inconclusive findings have made the electronic tax payment system debate open to future research. The gap in terms of time, location, literature and methodology is also a contributory factor to the differences in the various results of the effect of electronic tax system and revenue generation. Following the above listed gaps created by the prior studies in the light of mixed perspectives in research outcomes by different scholars; this study will fill the gap by introducing a clearer variables and analysis on electronic tax system and revenue generation in Nigeria. Also, this study shall expand prior researches by updating the data to 2020 and by using a more robust statistical analysis. Therefore, the main objective of this article is to empirically investigate electronic taxation system and revenue generation effectiveness in Nigeria. To achieve this objective, the following research questions were answered in the study:

1. What is the difference between pre-post electronic companies income tax and revenue generation in Nigeria?
2. What is the difference between pre-post electronic value added tax and revenue generation in Nigeria?
3. What is the difference between pre-post electronic capital gains tax and revenue generation in Nigeria?

The following hypotheses were tested:

Ho₁: There is no significant difference between pre-post electronic companies income tax and revenue generation in Nigeria.

Ho₂: There is no significant difference between pre-post electronic value added tax and revenue generation in Nigeria.

Ho₃: There is no significant difference between pre-post electronic capital gain tax and revenue generation in Nigeria.

Review of Related Literature

Conceptual Review

Concept of Tax

Onwuchekwa and Aruwa (2014) defined tax as a compulsory payment made by all taxpayers to the government of any given country from which social services are provided, without providing a statement of facts how the funds generated was spent or equating services with the funds collected. This is the reason Nasira, et al (2016) noted that an efficient and effective tax system

is capable of generating sufficient revenue for the provision of social amenities in any given country and to achieve the growth of the economy, equity in income distribution and maintain an economy that is in equilibrium. In the similar vein, Ogbonna and Appah (2012) maintained that tax has to do with an imposition of compulsory levy on citizens and upon their properties by the government for the provision of infrastructure, security and to provide a favourable conditions for achieving the overall economic well-being of the society. Dladla and Khobai (2018) maintained that taxes are a proportion of income of any given country and this has led to several studies to ascertain the long run association between taxes and economic growth. Also Omesi and Appah (2020) described tax as a compulsory levy imposed on individuals, companies and properties for the generation of government revenue in the provision of social goods and services in any given economy. Omesi and Appah (2020), Umoru and Anyiwe (2013) stated that there are different components of taxes in Nigeria such as personal income tax (PIT), petroleum profits tax (PPT), companies' income tax (CIT), educational tax (ET). The various elements of indirect taxes in Nigeria include, Value Added Tax (VAT) and Custom and Excise Duty (Manukaji, 2018). *Personal income tax* is a tax that is payable on the amount of income earned by the tax payer (Ogbonna & Appah, 2016; Manukaji, 2018). *Companies income tax*: Ogbonna and Appah (2016) stated that companies income tax is an income tax imposed on the chargeable profit of companies for any given financial year (Manukaji, 2018). *Petroleum profits tax*: Ogbonna & Appah, (2016); Manukaji, (2018) stated that petroleum profits tax is income tax that is imposed on companies which are engaged in the extraction and transportation of petroleum products. *Custom duties* are commodity taxes of imports and exports while *excise duties* are commodity taxes levied on goods manufactured within the country (Omesi & Appah, 2020).

Concept of Electronic Taxation

Electronic taxation is defined as the process of assessing, collecting and administering the taxation process through an electronic media. Also Awai and Oboh (2020) described electronic taxation as the system where taxes are assessed, collected and administered in an electronic media. According to Che-Azmi and Kamarulzaman (2014), electronic taxation is the media through which tax authorities around the world employ information and communication technologies to advance the provision of public services and the distribution of public administration information to the public. Wasao (2014) stated that electronic taxation are those online structures where a taxpayer is able to access using the internet all the services offered by a tax authority such as the registration for personal identification number, filing of returns and application for compliance certificate etc. The United Nations (2007) described electronic taxations a system where tax returns are filed electronically with the use of internet technology, the World Wide Web and software for a wide variety of tax administration and enforcement purposes. Awai and Oboh (2020), Ofurum et al (2018) noted that electronic tax payment system has demonstrated to be a major instrument in fighting the challenges of any tax system as it provides information, education and support to taxpayer and facilitates tax compliance and administration. It also guarantees a reduction in the cost of administering taxes and saves time (Abah, 2015). Umenweke and Ifediora (2016) also opined that electronic taxation is an automated process gradually phasing out the manual tax administration globally. It is achieved as taxpayers pay their taxes electronically quickly from the comfort of their homes, workplaces and other places where internet is available. Thus, tax authorities on their web portal will go after the defaulters via the taxpayer's electronic tax history.

Ofurum et al (2018) in Abdulrazaq (2015) explained that the elements of Federal Inland Revenue Service (FIRS) electronic tax system consists of

1. Taxpayers returns filed online: Taxpayers are required to file all their tax returns online, such as Companies Income Tax (CIT), Value Added Tax (VAT), Capital gains Tax (CGT) and Petroleum Profits Tax (PPT), through the online structure of FIRS.
2. Tax payment on the platform: Taxpayers are required to pay their taxes online from their bank accounts effective March 2015. This application which was developed in collaboration with the Nigeria Inter-Bank Settlement System (NIBBS) is hosted on the respective commercial bank's internet-banking platform.
3. Processing and issuance of Electronic Tax Clearance Certificates: Taxpayers are required to apply for a TCC online and get electronic tax clearance certificates via the platform.
4. Verification of Tax Identification Number (TIN): Companies are required to verify the TIN of their vendors on the platform. This would solve the stress encountered when filing Withholding Tax monthly.
5. Electronic correspondence with FIRS officials.
6. Online imposition of late filing penalties and interests: The online platform automatically compute and impose interest and penalties for late submission of tax returns or late payment of taxes.

Pemu (2017) mentioned that electronic taxation system began operations in Nigeria in the year 2017 with different mechanisms such as electronic filing, electronic registration, electronic tax clearance certificate, electronic stamp duty, electronic receipt, and electronic tax payment. Awai and Oboh (2020) argued that electronic tax system promotes efficiency, accountability, compliance, increase revenue and curb outflows in the Nigeria tax system. However, this objective has not been achieved because of the low ranking of Nigeria the ease of paying taxes. The effective and efficient implementation of electronic tax system would be a solution to the country's poor tax to GD Pratio (Onuiri et al, 2015).

The Internal Revenue Service of United State of America (USA) identified the three (3) major components of electronic tax system to include: electronic tax registration, electronic filing of tax returns and electronic tax payment (Chiamaka et al, 2021; Umenweke and Ifediora, 2016).

Electronic Tax Registration: This involves the acquisition of tax identification number (TIN) by the taxpayers. The taxpayer must complete the relevant form that requires documentation of substantiating status and true identity for each individual to obtain an individual taxpayer's identification number (Chiamaka et al, 2021). This documentation is to be mailed with the form to the address on the form. According to Umenweke and Ifediora (2016), in line with this, the individual taxpayer identification number is issued after the documents and the information furnished are validated by the relevant tax authority.

Electronic Filing of tax returns: This requires taxpayers to have an email address, log on to the website of the tax office and download the relevant form. The following information must be filled on the platform such as taxpayer's name, address, identification number, exemption, income, tax credit/deduction, other taxes and payments, amount owed and so on. After filling the tax return form, the taxpayer signs the tax return forms using a self-selected identification number and files it using the tax office. Upon submission of the filled return form, the returned and entire electronic record is transmitted to the tax office for processing where free file is being utilized. An email is sent to the taxpayer as soon as the tax return is received. Subsequently, the tax return is assessed, with the taxpayer's tax calculated within 48 hours. Where errors are detected, an error message is sent to the transmitter to correct and re-transmit the return to the tax office (Chiamaka et al, 2021; Umenweke and Ifediora, 2016).

Electronic tax payment: Upon being notified of tax due by email, the taxpayers have options through which payments can be made: by debit or credit card through which payment is done

through a payment processing company. The payment of the tax due can also be made by direct debit of the taxpayer's account. This involves the automatic withdrawal of the amount owed from the taxpayer's account from his bank with additional fees (Chiamaka et al, 2021; Umenweke and Ifediora, 2016).

Revenue Generation

Revenue generation is the main source of survival and challenge for all economy of the world including the developed and developing economies. That is the purpose why every nation is interested in the amount of revenue to be generated now and in the future since it is a determinant of economic growth and development. In the course of trying to solve the challenge of revenue generation, taxation which includes personal income tax, value added tax, company income tax, have been the major sources of government revenue in the economies of the world (Adegbe & Akinyemi, 2020). Onubia et al (2020) described revenue generation as a process by which a business strategies how to market and sell its products or services, in order to generate income. Government revenue is money government received. It is the quantity of cash that an organization really gets during a specific time (Ofurum et al., 2018). Government revenue is derived from several sources, such as oil and non-oil revenues.

Revenue generation in the public sector is the processes of raising funds for the government. The main source of income generation for any government is through taxation. Samuel and Tyokoso (2014) explained that revenue generation is a traditional function of a good tax system. Hence, the introduction of electronic taxation system was to increase revenue generation as taxpayers are able to pay taxes from different locations and at various times (Okunowo, 2015). Electronic taxation system improves revenue generation efforts of the government because it brings about reliability, accuracy, accountability, stewardship by reducing corruption and building taxpayers' trust in the system. It provides a less costly way of collecting taxes. It reduces running and overhead cost. It allows taxpayers to spend little or nothing in remitting taxes and filing returns, unlike the manual tax system where taxpayers incur some cost by going into the tax office for payment, clarification, and compliances. The electronic taxation system was established essentially to improve convenience/ease in the payment of tax and ultimately incorporate an efficient and transparent system that optimises voluntary compliance and tax revenue generation (Awai & Oboh, 2020; Onubia et al, 2020; Adegbe & Akinyemi, 2020; Adebayo & Idowu, 2020).

Theoretical Review

This study is anchored on innovation diffusion theory. This theory was made popular by Everett Rogers in book *Diffusion of Innovation* in 1962. According to Rogers (2003), diffusion is the process in which innovation is transferred over time among the members in a social system, while diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. Appah and Inini (2018) argued that the dominant assumption of this theory is that the diffusion of technology innovations follows a normal bell shaped distribution pattern. In this diffusion pattern, the theory distinguishes between five adopter segments, for which the theory holds to fixed assumptions on their size, profiles and adoption determinants. According to Rogers (2003), innovativeness or three timing of one's adoption decision is assumed to be determined by the subjectivity perception of a set of product features (relative advantage, complexity, compatibility, trialability and observability). Innovators and early adopters, for example, are assumed to have a higher perception of relative advantage than the majority segments and a lower complexity perception. The aggregation of adoption decisions diffusion pattern, in which innovators (2.5%), early adaptors (13.5%), early majority (34%), late majority (34%) and laggards (16%) are distinguished. Aggregated cumulatively, diffusion is reflected in an S-shaped penetration pattern. According to diffusionism,

technological innovation and social progress in a given society are mainly determined by technology features, thus, electronic tax payment is an indication of the adoption of technology features and innovation. This theory is relevant to this study because the elements that impact the spread of a new idea is been considered by the relevant tax authorities such as Federal Inland Revenue Services (FIRS), more specifically by involving Nigeria Inter-Bank Settlement System as a medium through which taxpayers can conveniently pay their taxes (Ofurum et al, 2018).

Empirical Review

Chiamaka et al (2021) conducted a study of electronic tax system and internally generated revenue in Ebonyi State, Nigeria. The study used anchored on expediency theory of taxation and technology acceptance model. The study used cross-sectional survey research design. The population consisted of 124 qualified and experienced respondents from Ebonyi State Board of Internal Revenue and a sample size of 94 respondents was used for data analysis. The study used primary data obtained from a structured questionnaire designed by the researchers. The responses obtained from the questionnaire were analysed using descriptive and multiple regression analysis. The results from the analysis disclosed that electronic tax registration and electronic filing of tax returns influences the internally generated revenue in Ebonyi State and electronic tax payment does not statistically show significant effect on the internally generated revenue of state. The study recommended the Board should adopt a user friendly electronic tax system that can make electronic tax filing and payment easy for the taxpayers in Ebonyi State.

Onuselogu and Onuora (2021) investigated e-tax payment and revenue generation in Nigeria. The study specific objectives were to determine the effect of e-company income tax payment on revenue generation in Nigeria; e-capital gain tax payment on revenue generation in Nigeria. The study employed ex post facto research design and secondary data was collected from Federal Inland Revenue Service (FIRS) and Central Bank of Nigeria (CBN) Statistical release and Quarterly Economic Reports. The secondary data collected were analysed using Ordinary Least Square Method. The findings revealed that e-company income tax payment has an insignificant positive influence on revenue generation in Nigeria. Also e-capital gain tax payment has negative effect on revenue generation and was statistically insignificant at 5% level of significance. The study among others recommended that to maximize the positive consequence of e-company income tax payment, the government of Nigeria should set modalities on how to inform firms on the significance of e-tax payment to businesses and the government in general.

Oladele et al (2020) conducted a study of electronic tax administration and tax compliance in Nigeria. The study employed quantitative research design using existing data sourced from the Federal Inland Revenue Service (FIRS). The data were tax revenue posted seven years before and after the adoption of electronic tax by the FIR. The secondary data were analyzed using descriptive statistics and pair-wise t-test to ascertain if a difference exists and or relationship between pre-and post-e-tax revenue. The findings disclosed a strong correlation between the electronic tax system and tax compliance (tax revenue) as shown by the pair-wise test. Also, the mean tax revenue during post-and pre-e-tax of (4466828.5714>3051200.0000); and an average annual variation in overall tax revenue of N1.4trillion compared with pre-electronic tax period established a significant difference. The study concluded that a strong association exists between electronic taxation and tax compliance. Therefore, the study recommended that the FIRS should further expand the Information Communication Technology (ICT) architecture for easy access and flexibility to encourage taxpayers as well as enhancing robust tax administration in Nigeria.

Onubia et al (2020) investigated e-tax assessment on revenue generation in Nigeria. The investigation employed ex post facto research design and secondary data was collected from the Federal Inland Revenue Service (FIRS) and Central Bank of Nigeria (CBN) Statistical and

Quarterly Economic Reports from first quarter of 2012 to second quarter of 2018. The data collected were analysed using Ordinary Least Square Method. The findings showed a significant effect of pre (before the starter of e-tax assessment) company income tax and value added tax on revenue generation in Nigeria and an insignificant effect of post annual duty income and value added assessment income on revenue generation in Nigeria at 5% level of significance. This findings show that e-tax collection has not contributed particularly to both company income tax revenue and value added tax revenue generation in Nigeria; though there is an unwanted immaterial impact of pre and post capital gain charge income on revenue generation in Nigeria.

Adegbe and Akinyemi (2020) examined electronic payment system and revenue generation in Lagos State, Nigeria. The study used cross sectional survey research and correlational research designs. The study population was 4275 staff of six selected revenue generating agencies in Lagos State. Taro Yamene method of sample size determination was utilized to arrive at a sample size of 366. Primary and secondary data was employed in the study. The primary data were collected from a structured questionnaire with a reliability coefficient of 0.71 to 0.93. The primary data were analysed with descriptive statistics, analysis of variance (ANOVA) and multiple regression analysis model. The findings from the analysis disclosed that electronic payment proxies of automated teller machine (ATM) and electronic tax card (ETC) significantly and positively influences personal income tax generation; automated teller machine (ATM) and electronic tax card (ETC) significantly and positively influences the payment of penalties and personal income tax generation; automated teller machine (ATM) and electronic tax card (ETC) significantly and positively influences the payment of rates. Hence, the study suggested that automated teller machine positively and significantly influences revenue from penalty but electronic tax card negatively influences revenue.

Adebayo and Idowu (2020) studied electronic-taxation and revenue-generating effectiveness in the era of Treasury Single Account operations from 2010 to 2019. The study employed ex post facto research design and secondary data was collected from Federal Inland Revenue Service, CBN, and Economic Reports from 2010 to 2019. The collected data were grouped into pre and post-e-tax periods. The data collected from the secondary sources were analysed using descriptive and t-statistics. The results from the study indicated that before the implementation of e-taxation and Treasury Single Account in Nigeria, revenue generation reported from federally collected revenue was below average, and tax-to-GDP in Nigeria is below standard obtained from neighboring Africa countries as the P-value is $0.44454 > 0.05$ level of significance while the tax revenue and tax-to-GDP significantly improved after e-taxation and TSA were successfully implemented. The findings also revealed that tax revenue declined after the implementation but the mean difference was not statistically significant.

Ofurum et al. (2018) studied e-tax collection on Nigeria's revenue and economic growth utilizing pre-post method of analysis. The study utilized ex-post facto research design and secondary data were collected from the Federal Inland Revenue Service (FIRS) and Central Bank of Nigeria (CBN) Statistical Bulletin on quarterly basis from second quarter 2013 to final quarter 2016. The secondary data collected from FIRS and CBN were analysed using t-test and the results obtained disclosed that e-tax assessment do not improve the amount of revenue generated and tax-to-GDP proportion in Nigeria. The study further revealed that revenue generation and tax-to-GDP ratio importantly contracted after e-taxes was applied. The findings also suggested that tax revenue reduced after the application but the mean variance was not statistically significant.

Olurankinse and Oladeji (2018) investigated self-assessment, e-tax payment systems and revenue generation in Nigeria. The study employed cross sectional survey research design and data was obtained from a well-structured questionnaire after face validity and reliability test using Cronbach alpha. The questionnaire respondents consisted of 30 tax executives from 30 registered companies in Rivers State, Nigeria. The data collected from the administered questionnaires were analysed using Pearson Product Moment Correlation Coefficient tool and

regression analysis. The findings from the statistical analysis disclosed that a significant relationship between self-assessment and e-tax payment system on revenue generation in Rivers State, Nigeria.

Olaoye and Atilola (2018) conducted a study of e-tax payment on income generation in Nigeria. The study used cross sectional survey research design. The study employed primary and secondary sources of data collection. The primary data was collected from a questionnaire after proper validity and reliability tests. The secondary data were obtained from the Central Bank of Nigeria Statistical Bulletin. The data obtained from the questionnaire were analysed using univariate analysis and paired sampled t-test. The study applied secondary data from the first quarter of 2012 to the 2nd quarter of 2018. The results from the various analysis showed that e-taxes has an optimistic insignificant influence on value added tax proceeds in Nigeria. Secondly, it was also exposed that e-taxes has an optimistic insignificant influence on company income tax proceeds in Nigeria. Finally, the study revealed that e-taxes have an optimistic insignificant effect on capital Gain tax revenue in Nigeria with t-statistics and p-value of 1.218 and 0.247 respectively.

Allahverd et al. (2017) investigated e-tax assessment on income and cost in Turkey. The study employed ex post facto research design. The study used secondary sources of data collection obtained from the Turkish revenue authority. The data collected were analysed using Mann-Whitney U Test for pre-electronic 1993-2004 to post-electronic 2005-2016. The data analysis disclosed that converting from pre electronic taxes to post electronic taxes significantly affects tax revenues and reduced the expense per charge.

Monica et al. (2017) studied e-taxes on revenue generation capability in local tax department of Kenya Revenue Authority (KRA). The study used cross sectional survey research design and primary sources of data collection from a well-structured questionnaire. The questionnaire was tested for validity and reliability using content with cronbach alpha method. The responses obtained from the administered questionnaires were analysed using descriptive and inferential statistics. The study revealed that most tax payers strongly decided that they were able to completely access and operate e-tax system. Also the competence of employees was a significant predictor of tax generation proficiency with the results as ($t = -2.243$, $P = .154 > 5\%$).

Owino, et al (2017) investigated information and communication technology on revenue collection in County Governments in Kenya. The study employed cross sectional survey research design and correlation research design. The target population comprised of 864 made up of 848 revenue clerks and 16 revenue officers and a sample size of 86 respondents were selected using stratified random sampling method. The study made use of primary data obtained from a well-structured questionnaire after validity and reliability tests. The responses obtained from the questionnaire were analysed using univariate and multivariate analysis. The results from the multiple regression analysis revealed a significant and positive relationship between ICT and revenue generation. The use of ICT in tax payment explains up to 91.9% variation in revenue generation in Kenya. The result also disclosed that the use of ICT in tax assessment and collection enhances revenue generation efficiency in Kenya.

Nasir (2015) conducted a study of e-tax fillings and payments in Malaysia. The study employed ex post facto research design. The study employed secondary data from Malaysian Inland Revenue report from 2004 to 2011. The secondary data were analysed using descriptive analysis. For the years 2004 and 2005 the number of taxpayers using the e –filling system remained far below expectation at about 5% and the tax authorities were still tackling the challenges posed by the new system. For the years 2006 to 2011 brought an increase in the use of the system from the disappointing 4% to an Encouraging 34% and 37% in 2012, over the same period tax

returns increased from 14.5% of 52GDP to 15.3%. It also indicated how compliance increased and fewer hours used in collecting taxes. The study suggested that electronic filling and tax payment benefits both tax payer and tax authorities and guarantees a better standard of living for all citizens through improved revenue generation.

METHODOLOGY

This study used co-relational *ex-post facto* research design to ascertain the nexus between electronic taxation and revenue generation in Nigeria using quarterly data for the period 2012-2020. The *ex-post facto* method was used on the basis that the researcher is not given an opportunity to control the variables since they have just occurred and can't be affected. The study used secondary data collected from Federal Inland Revenue Service (FIRS) and Central Bank of Nigeria. This study utilized descriptive statistics and quasi-test plans of Pre-Post structure for the investigation. It calculated the influence of a treatment on an outcome by comparing the variation over time in the outcome variable for the treatment group. The paired sample *t*-test also called Pre-Post Test was applied as the method of data analysis. Paired sample *t*-test is a statistical method utilized to ascertain whether the mean difference between two groups of observations is zero. In a paired sample *t*-test, each subject is measured twice, resulting in *pairs* of observations. This method is appropriate because each variable was grouped into two observations (pre electronic taxation implementation and post electronic taxation implementation).

RESULT AND DISCUSSION

Table 1 Descriptive Statistics of the Variables

		Pre Electronic Taxation				Post Electronic Taxation			
		RG	CIT	VAT	CGT	RG	CIT	VAT	CGT
N	Valid	13	13	13	13	13	13	13	13
Mean		3.2558	2.3386	2.2876	2.4208	3.1064	2.3956	2.2683	9.2239
Std. Deviation		.15216	.18968	.03557	4.49519	.10647	.24346	.22245	20.21305
Skewness		-.056	.820	.073	3.143	-.118	-1.050	-1.937	3.007
Std. Error of Skewness		.616	.616	.616	.616	.616	.616	.616	.616
Kurtosis		-1.984	.294	-1.039	10.495	.322	1.358	2.645	9.474
Std. Error of Kurtosis		1.191	1.191	1.191	1.191	1.191	1.191	1.191	1.191
Minimum		3.07	2.07	2.23	.06	2.89	1.81	1.75	.11
Maximum		3.44	2.75	2.35	16.78	3.28	2.70	2.43	72.59

Source: Generated by Researcher via SPSS Output

Table 1 presented the performance of the respective period under Pre-electronic taxation and Post-electronic taxation. The overall measure of revenue generation (RG) under indicates Pre-regime shows a higher RG Mean (3.2558) and Standard Deviation (0.15216) than under Post-Period Mean (3.1064) and Standard Deviation (0.10647). Similarly, RG under Pre-period shows a higher growth rate of Minimum (3.07) and Maximum (3.44) than under Post-period Minimum (2.89) and Maximum (3.28). However, RG under Pre-period and Post-Period indicates -0.056 and -0.118 skewness respectively implies that both periods have a long right tail. Finally, RG under

Post-period shows a positive Kurtosis (0.322) implies that the extent of flatness of the distribution of the data series is relative to normality curve while RG under Pre-period shows a negative Kurtosis (-1.984) indicating that the extent of flatness of the distribution of the data series relative less than the normality curve.

Table 1 also presented the individual measures of electronic taxation system under Pre-period and Post-period. The Mean statistics indicates that Pre-period has lesser Company Income Tax (CIT) Mean-value of 2.3386 than Post-Period Mean-value of 2.3956, Pre-period has greater Value-added Tax (VAT) Mean-value of 2.2876 than Post-Period Mean-value of 2.2683, Pre-period had lesser Capital Gain Tax (CGT) Mean-value of 2.4208 than Post-Period Mean-value of 9.2239. However, CIT under Pre-Period shows a higher growth rate of Minimum (2.07) and Maximum (2.75) than under Post-Period Minimum (1.81) and Maximum (2.70), VAT under Pre-Period shows a higher growth rate of Minimum and Maximum than Post-Period while CGT under Pre-Period showed a lesser growth rate of Minimum (0.06) and Maximum (16.78) than under Post-Period Minimum (0.11) and Maximum (72.59). Finally, CIT and VAT under Pre-Period indicates 0.820 and 0.073 are positive skewed, implies that they have a long right tail but CIT and VAT under Post-Period are negative skewed which indicates that, they have a short right tail while CGT under both period are positive skewed implied that, it have a long right tail. CIT and CGT under Pre-period and Post-Period showed a positive Kurtosis implies that the extent of flatness of the distribution of the data series relative to normal while VAT under Pre-period shows a negative Kurtosis (-1.039) indicating that the extent of flatness of the distribution of the data series relative less than the normal curve. But VAT under Post-Period indicates positive kurtosis (2.645) implied that the extent of flatness of the distribution of the data series relative to normality curve.

A comparison of the above measures showed that neither Pre-Post nor Post-Period consistently outperformed the other. In order to ascertain whether there are significant relationship differences in the above result, the paired sample *t*-test also called Pre-Post Test is presented below:

Test of Hypothesis One: There is no significant relationship between Pre-Post electronic company income tax and revenue generation in Nigeria

Table 2: Paired Samples Test

		Paired Differences					
		Mean	Std. Dev	Std. Error Mean	t-Cal	t-Crit	Sig.
Pair 1	PRECIT - PRERG	-.91718	.2051	.05691	-16.116	3.055	.000
Pair 2	POSTCIT - POSTCGT	-.71078	.28647	.07945	-8.946	3.055	.000

Source: Generated by Researcher Via SPSS Output

The result in table 2 indicates that the Mean difference between Pre-Post electronic company income tax and revenue generation in Nigeria were -0.91718 and -0.71078 respectively. However the result derived shows that Pre-electronic company income tax and revenue generation had greater Mean score than Post-electronic company income tax and revenue generation in Nigeria. Nevertheless, when the Mean difference was subjected to paired samples *t*-test analysis, it was found that the calculated *t*-values -16.116 and -8.946 is greater than the corresponding critical *t*- value 3.055 with 12 degrees of freedom at 5% (0.05) level of significant

under both Period for a two (2) tailed test sig (P-Values) 0.000;0.000 < 0.05. Thus, the null research hypothesis under Pre-Period and Post-Period condition was rejected. This means that there is a significant difference between Pre-Post electronic company income tax and revenue generation in Nigeria.

Test of Hypothesis Two: There is no significant relationship between Pre-Post electronic value-added tax and revenue generation in Nigeria

Table 3: Paired Samples Test

		Paired Differences			t-Cal	t-Crit	df	Sig.
		Mean	Std. Dev	Std. Error Mean				
Pair 1	PREVAT - PRERG	-.96815	.12489	.03464	-27.949	3.055	12	.001
Pair 2	POSTVAT - POSTRG	-.83812	.29174	.08091	-10.358	3.055	12	.000

Source: Generated by Researcher Via SPSS Output

The result in table 3 indicates that, the Mean difference between Pre-Post electronic value-added tax and revenue generation in Nigeria was -0.96815 and -0.83812 respectively. However the result derived shows that Pre-electronic value-added tax and revenue generation had greater Mean score than Post-electronic value-added tax and revenue generation in Nigeria. Nevertheless, when the Mean difference was subjected to paired samples t-test analysis, it was found that the calculated t-values -27.949 and -10.358 is greater than the corresponding critical t- value 3.055 with 12 degrees of freedom at 5% (0.05) level of significant under both Period for a two (2) tailed test sig (P-Values) 0.001;0.000 < 0.05. Thus, the null research hypothesis under Pre-Period and Post-Period condition was rejected. This means that there is a significant difference between Pre-Post electronic value-added tax and revenue generation in Nigeria.

Test of Hypothesis Three: There is no significant relationship between Pre-Post electronic capital gain tax and revenue generation in Nigeria

Table 4: Paired Samples Test

		Paired Differences			t-Cal	t-Crit	df	Sig.
		Mean	Std. Dev	Std. Error Mean				
Pair 1	PRECGT - PRERG	-.83494	4.5392	1.2589	-.663	3.055	12	.520
Pair 2	POSTCGT - POSTRG	6.11751	20.2127	5.6060	1.091	3.055	12	.297

Source: Generated by Researcher Via SPSS Output

The result in table 4 indicates that, the Mean difference between Pre-Post electronic capital gain tax and revenue generation in Nigeria was -0.83494 and -6.11751 respectively. However the result derived shows that Pre-electronic capital gain tax and revenue generation had less Mean score than Post-electronic capital gain tax and revenue generation in Nigeria. Nevertheless, when the Mean difference was subjected to paired samples t-test analysis, it was found that the calculated t-values 0.663 and 1.091 is less than the corresponding critical t- value 3.055 with 12 degrees of freedom at 5% (0.05) level of significant under both Period for a two (2) tailed test sig (P-Values) 0.0520;0.297 > 0.05. Thus, the null research hypothesis under Pre-Period and

Post-Period condition was accepted. This means that there is no significant difference between Pre-Post electronic capital gain tax and revenue generation in Nigeria.

CONCLUSION AND RECOMMENDATIONS

This study investigated electronic taxation system and revenue generation effectiveness in Nigeria: A pre-post analysis. The study utilized descriptive statistics and the paired sample *t*-test for the analysis of data. The results revealed significant difference between Pre-Post electronic company income tax and revenue generation; significant difference between Pre-Post electronic value-added tax and revenue generation, no significant difference between Pre-Post electronic capital gain tax and revenue generation in Nigeria. This research empirically results conglomerated the results of prior studies such as Ofurum et al. (2018); Oladele et al (2020); Adegbe and Akinyemi (2020); Adebayo and Idowu (2020); Chiamaka et al (2021); Onuselogu and Onuora (2021). Their findings revealed that pre and post electronic taxation had significant difference with revenue generation. However, Olaoye and Atilola (2018) and Onubia et al (2020) empirical findings disagreed with this study results, the results of their findings revealed negative and insignificant relationship between electronic taxation system and revenue generation. On the basis of the empirical result, the study concluded that there is significant difference between pre-post electronic taxation system and revenue generation effectiveness in Nigeria. Therefore, on the basis of the conclusion, the study recommends as follows:

1. Government should ensure compliance to electronic tax payments system because electronic taxation system in term of company income tax and value-added tax generate more revenue in Nigeria.
2. Tax authorities should evaluate electronic taxation system in term of capital gain tax because the study affirmed that, electronic taxation in term of capital gain tax for pre-post period has insignificant relationship with revenue generation in Nigeria.
3. The study suggested that electronic filling and tax payment benefits both tax payer and tax authorities and guarantees a better standard of living for all citizens through improved revenue generation.

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