

An Evaluation of Tax Digitalization Efforts by Federal Inland Revenue Service and their Impacts on Tax Collection 2002-2021

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Abstract

The federating states and capital of federal republic of Nigeria are too dependent on federally collected revenues largely from oil and gas. However, taxation is indisputably the most viable and sustainable means of raising revenue for public expenditures. Therefore, the federal government can enhance its bases of taxation to generate more tax revenue for the federating units to share especially with known shocks in oil and gas revenue. Conversely, increasing number of individuals and corporate bodies that pay taxes to the federal government are making tax administration more difficult. To overcome this, the Federal Inland Revenue Service (FIRS) has embarked on processes of digitizing tax administration at the federal level. Consequently, the aim of this study is to evaluate the impact of the tax digitalization processes by FIRS by one, describing the digitalizations and two, by undertaking trend analyses of total tax revenue collections 2002-2021. To achieve these, secondary data is collected from the literature and publications of the FIRS while public policy analytical framework underpins the study. Results from the study revealed that there are consistencies in efforts by the FIRS to digitalize tax administration in Nigeria even though implemented in short time intervals. Similarly, on the overall, there are increasing but fluctuating trends of tax revenue collection by FIRS 2002-2021 implying the positive impacts of the current digitalization efforts.

Keywords: Tax, Digitization, FIRS, Impacts, Public Policy

1. Introduction

The collection of taxes and fees is fundamental for countries to generate public revenues to finance investments in human capital, infrastructure and the provision of services for citizens and businesses. This is even most important for developing countries having an estimated annual \$2.5trillion financing gap towards achieving the Sustainable Development Goals (SDGs). This is coming at a time when many developing countries are still struggling to collect sufficient tax revenues to finance their own development with many collecting less than 15% of their Gross Domestic Product (GDP) in taxes. This threshold of 15% tax to GDP ratio is regarded as tipping

point to make a state viable and put it on growth path; thus, countries with less than the threshold must increase their tax revenue collection to meet basic needs of citizens and businesses (World Bank, 2022). Nigeria as a developing African country and recorded a tax to GDP ratio of 6% in 2019 which is far below the average of 16.60% for Africa (Organization for Economic Cooperation and Development, 2021b) making Nigeria to be in the company of war-torn countries of Yemen and Somalia (Akinmurele, 2022).

However, it is contended that while the official numbers suggest that the government is collecting less taxes as percentage of GDP, Nigerians are actually paying lot of taxes, paying not only formal taxes but also paying informal and implicit taxes; thus, it is the government that is collecting so little from the formal taxes (Akinmurele, 2022). This may not be unconnected with poor tax administration, unavailability of tax statistics, tax multiplicity, failure to prioritize tax efforts, regulatory challenges, structural problems in the economy and complexity of the tax laws among the numerous problems confronting tax administration in the country (Onuigbo, 2021; Simeon, Simeon, & Roberts, 2017). Conversely, Nigeria's rapidly increasing population means more added pressure on available public infrastructures and services and the greater need to build more infrastructures and enhancement of provision of services (World Bank, 2022b). These can only be achieved if the federal government is able to enhance inflow of viable and sustainable revenue such as revenues from taxes. Currently, the federal pool of revenue on which both the federal, state local governments heavily depend on is from oil and gas natural resources which are almost always associated with shocks and rent seeking (Ogbonna & Ebimobowei, 2013).

To overcome the challenges in tax administration and reduce the heavy reliance on oil and gas revenues, the Federal Inland Revenue Services (FIRS) has embarked on digitalization of its services for easy and enhanced revenue collection (Federal Inland Revenue Service, 2022a). Therefore, the aim of this study is to evaluate the impact of the tax digitalization processes by FIRS by one, describing the digitalization processes and two, by undertaking trend analyses of total tax revenue collections 2002-2021. In this way the study reveals the efforts of successive governments towards digitalization of tax administration in Nigeria consistent with emerging global best practice of enhancing tax administration. Similarly, the study reveals the impacts of the digitalization efforts on tax revenue collection over the period of the study and these may be useful to policy makers, tax administrators and taxpayers. This is section one of the paper; section two is on literature review, conceptual and empirical. Section three is on methods of conducting the study, section four is results and discussions while section five is conclusion of the study.

2. Literature Review

2.1 History of Digitizing Taxation

Nigeria is a federal republic consisting of 774 local government councils within 36 states of the federation and Abuja as Federal Capital Territory (FCT). Therefore, there are three tax jurisdictions consisting of FIRS, 36 State Internal Revenue Services (SIRS), FCT Internal Revenue Service and local government revenue committees; however, the focus of this study is the FIRS. The Inland Revenue Department (IRD) of the British West Africa covering Ghana, Gambia, Sierra Leone and Nigeria is the precursor of the present-day FIRS. The Nigerian Inland Revenue Department (NIRD) was created and carved out from the British IRD in 1943 which was renamed

the Federal Board of Inland Revenue (FBIR) under the Income Tax Ordinance (CITO) No.39 of 1958. The Companies and Income Tax Act No.22 of 1961 maintained the name FBIR and the FIRS Act 2007 created the FIRS with financial and administrative autonomy (Federal Inland Revenue Service, 2022b).

This federal tax jurisdiction is responsible for collecting Petroleum Profits Tax (PPT), Companies Income Tax (CIT), Value Added Tax (VAT) and Education Tax (ET) among numerous federally collected taxes and levies (Federal Inland Revenue Service, 2022b). These federally collected taxes and levies are pooled into the Federation Account or the Treasury Single Account (TSA) and subsequently shared between the federal government, the 36 states and FCT and the 774 local governments as the federating units (Amadi & Obutte, 2018). Taxes and levies collection by FIRS are key determinants of the total amount of money available for sharing between the federating units. This prompted FIRS to start digitalizing its tax administration with the aim of easing services to tax payers, enhance compliance which in turn is expected to increase overall revenue collection.

2.1.1 Digitalization of tax administration

The Nigerian federal government carried out reforms in the country's civil service which affected federal agencies like FIRS in 1988. In what could be described as an effort to align federal agencies like FIRS with emerging technological development, the reform required Nigerian public agencies to devote a specific percentage of their annual budgets to implementing staff training programmes that must include modern Information Technology (IT) training (Tiamiyu, 2000a). However, despite the reforms expected to institutionalize modern information processing cultures in federal government agencies such as FIRS, there are inadequate levels of availability and accessibility of modern IT components in the agencies. Indeed, there are substantial gaps between perception of need and actual accessibility and opportunity to use some of the IT components in the agencies. This was the situation of the use of modern information technology in the Nigerian public system up to the year 2000 (Tiamiyu, 2000b). It is in this situation that the FIRS began to digitize its operation commencing with the modernization project in 2005.

2.1.1.1 the modernization project

Operations of FIRS such as tax returns filling, payments, generation of receipts, compliance tracking and tax clearance certification are mainly carried out through manual procedures up to 2005. These procedures provided ample room for interactions between staff and taxpayers thereby increasing chances for fraud, reducing compliance and overall tax collection. Similarly, there are inherent lapses in the collection, skimming of revenue and fraudulent tax clearances among other problems associated with the manual procedures. To overcome these and other challenges, FIRS started leveraging on IT in 2005 when a modernization project was initiated saddled with strategic planning towards automating operations of the agency as a reform agenda. Automating tax filling and collection is to curtail corruption, increase FIRS's monitoring and tracking capabilities (Bennet, 2012). The project was regarded as a huge success that laid the foundation of subsequent digitalization efforts in the service. The major challenge that the modernization projects faced was getting the full support of all stakeholders especially the executive and the legislature (Premium Times, 2020). Therefore, it could be argued that the modernization project in FIRS has recorded

significant achievements as it is adjudged the foundation of subsequent digitalization efforts such as TIN in 2011.

2.1.1.2 the taxpayer identification number (TIN)

Tax collection was identified as one of the major weaknesses of the manual procedures operated by FIRS as it is prone with problems such as difficulty in identifying taxpayers, lack of standardized collection systems by banks leading to ease of manipulations, differences in timing between payment and remittance to FIRS thereby making it difficult to track defaulters and offshore tax payments. To overcome these, FIRS initiated an automated collection solution known as Project-FACT (Friendly, Accurate, Complete and Timely) making it possible to track online real time what tax was collected, who made the payment, where it was paid, when it was paid, who received the payment, how much was paid, and where the funds were. Furthermore, to assure taxpayers that collected taxes are properly accounted for and have reached the expected destination for the development of Nigeria, the Taxpayer Identification Number (TIN) was officially launched on 5th April 2011 (Premium Times, 2020). However, it appears significant implementation of TIN was not achieved up to towards the end of 2012 (Nigerian Governors Forum, 2012). Before TIN, the Unique Tax Identification Number (U-TIN) was launched as an electronic system meant to store the information of tax payers and facilitate information sharing among tax authorities and other stakeholders. But the project was not successful (Deloitte, 2015).

TIN is a 10-digit unique number given to tax payers in Nigeria with the aim of creating closer linkage between tax payers and the various tax authorities in Nigeria. This in turn is expected to aid in achieving cooperation, information sharing and closer working relationship among relevant tax authorities and increase revenue generation accruing to all tiers of the governments (The Act, 1998). Therefore, TIN created a national platform for the registration and allocation of an identification number to all taxpayers, which in turn created reliable and centralized data of all taxpayers in the country, widen the tax bases; enhance tax assessments, determination of appropriate tax liabilities of individuals and corporate organizations and assist in checkmating tax compliance through the computerized system (Ezegwu & Agbaji, 2014). TIN has resulted in increasing the number of taxpayers in Nigeria from 10million in 2015 to 14million in 2017 to 19million in 2018 and about 45million in 2019 and over 3million registered companies as at 2019 (The Cable, 2019). The major challenge of TIN is multiplicity of TIN for tax payers as federal and state tax authorities could issue different numbers to a single taxpayer (The Nation, 2014) and perhaps the reason for slow registration by taxpayers (Ezegwu & Agbaji, 2014). Despite these, the launching and successful implementation of TIN could be contended as having moved the digitalization process forward from its modernization stage. Therefore, the issuance of TIN in 2011 is considered the beginning of digitalization tax administration in Nigeria within the context of this study. Succeeding TIN in the digitalization efforts is the Integrated Tax Administration System (ITAS).

2.1.1.3 integrated tax administration system (ITAS)

To further strengthen and automate tax administration in Nigeria, FIRS embarked on an Integrated Tax Administration System (ITAS) project in 2013 aimed at enhancing tax administration and simplifying tax compliance process by leveraging on technology. The implementation of ITAS

was to ensure to ensure assigning of one unique TIN (The Nation, 2014). In this way ITAS will result in re-engineering and automating tax administration processes by FIRS including registration, assessment, payment, debt management, audit and investigation, case management and returns filing. Similarly, implementation of ITAS will assist in achieving the goals of improving revenue collection, transparency in tax administration, enhance voluntary compliance and improve the overall efficiency of tax administration. With ITAS, taxpayers will be able to file their tax returns electronically, pay their taxes online, get instant credit for withholding taxes deducted on their income, generate tax clearance certificates, automatic imposition of late filing penalties and interests, and communicate with the FIRS. Thus, ITAS will assist in delivering a seamless integrated solution which incorporates international good practices for revenue administration in Nigeria (PriceWaterCoopers, 2015).

The ITAS project team has trained about 5,000 staff service wide on the usage of the operational modules deployed so far. As at November, 2020, over 721,000 assessments have been raised on the system cutting across the different types of tax with over 66,000 being e-filed. ITAS has improved Nigeria's ranking in ease of doing business through e-filing up to 39 places moving from 146 in 2016 to 131 in 2019. It has also set up online support team which has resolved over 5,700 issues received from users across the service. The challenges of ITAS among others include deployment of parallel initiatives that could do similar work such as SIGTAS, delay in approval of planned project activities and unavailability of resident project management and technical support by the contractor (Unpublished, 2018). Arguably, ITAS has further moved forward the efforts of digitalization of tax administration in Nigeria. However, soon after the launch of ITAS in 2013, FIRS launched another digitalization effort in 2014 perhaps to strengthen ITAS known as Standard Integrated Government Tax Administration System (SIGTAS).

2.1.1.4 standard integrated government tax administration system (SIGTAS)

This is a software utilized by the recipient for assessing and collecting revenues launched in 2014 with the aim of providing taxpayers with wide range of benefits. These include automatic calculation of tax and penalty, identification of errors or omissions by taxpayer through tax declaration processing. Generation of assessment notices, payment reminders and taxpayer correspondences automatically, automated payment posting and receipt generation, provision of an integrated view of taxpayer affairs across all tax types and reduced cost of compliance (The Nation, 2014). Under SIGTAS, when a payer remits Withholding Tax (WHT) deducted from a contracting party, the system credits the accounts of all the beneficiaries directly, making the credit automatically available for utilization (Deloitte, 2018). Over 5,704 SIGTAS and 943 e-filing user accounts have been created for staff, the system has over 32,255 taxpayers registered on the e-filing platform out of which about 6,453 have filed their returns online. A total of 1,826,508 corporate taxpayers are currently registered in ITAS system (SIGTAS); and about 120;000 additional records are being processed for upload (Unpublished, 2018). From the foregoing, SIGTAS has built on ITAS to strengthen the digitalization of tax administration in Nigeria. To further strengthen the tax administration digitalization efforts of FIRS, the service scrapped ITAS and SIGTAS in 2022 on introducing TaxPro-Max solution (The Dream Daily, 2022).

2.1.1.5 taxpro-max solution

TaxPro Max is the latest automated tax administration solution from FIRS with its portal opened on 7th of June 2021 displaying more features and capabilities compared to earlier modules such as SIGTAS and ITAS. The application was launched following the provisions of the Finance Act 2020 that empowers FIRS to automate tax return filing and payment processes. It is adjudged as a one-stop online tax administration platform offering taxpayers the opportunity to register, file returns, remit taxes, carry out assessments and keep track of tax obligations. Taxpayers will also manage withholding tax deductions, manage capital allowance and loss, download tax clearance certificate, and communicate with the FIRS on tax issues among other services. Taxpayers can access the portal by registering which allow them to get log-in details subsequently required for filling returns. On filing the returns, a Document Identity Number (DIN) will be generated which will then be used to remit taxes via the portal. Filling of tax returns can be executed by taxpayers or their approved agents via the portal and for those tax payers that may want to file their returns in hard copy, they can visit any FIRS office where their documents will be upload to the portal (The Chartered Institute of Taxation, 2022). It could be contended that the launching of TaxPro-Max has enhanced the digitalization of tax administration by FIRS.

The 2022 report of the Institute of Chartered Accountants in England and Welsh (ICAEW) stated that digitalization of tax administration in Nigeria is still in its early stages; much still need to be done to make sure that future attempts at the modernization are more successful. Currently, most of the digitalization projects are launched at short notice and without sufficient resources and legislative support, leading to ultimately failed projects. Thus, there is need for Nigerian administration to work on longer-term transformation projects which are legislatively supported, secured and well-planned to be able to succeed. It is further contended that if properly run, digitalization of tax administration in Nigeria would significantly improve efficiencies of taxpayers. It would also support the wider modernization of the Nigerian economy particularly by capturing the large number of undigitized small and medium enterprises in the country. Despite these shortcomings, the report stated that existing projects towards digitalization of tax administration in Nigeria have resulted in improving tax revenues (Institute of Chartered Accountants in England and Welsh, 2022).

Similarly, the 2021 technology and innovation report of the United Nations Conference on Trade and Development (UNCTAD) assessed 158 countries on readiness for frontier technologies using a scale of 0 to 1 based on one of four 25 percentiles. The four percentiles are grouped into low (0.25), lower-middle (0.50), upper-middle (0.75), and high values (1) with Nigeria scoring 0.20 placing it on 124th position. This on one hand is portraying Nigeria's low adoption of technology with a score lower than the first 25 percentile, on the other hand it is depicting the potentials of the country to further leverage on technology on taxation and all other facets of public affairs (United Nations Conference on Trade and Development, 2021). Preceding sections have brought to light the efforts to digitalize tax administration in Nigeria; there are empirical findings on the impacts of digitalization of tax administration on tax revenue collection.

2.2. Empirical Literature Review

Martínez, Arzozb, and Arreguic (2022) examined whether tax collection efficiency in 28 countries of Organization for Economic Cooperation and Development (OECD) improves via decentralization, simplification, digitalization and education. The study offers an assessment of tax administration performance and provides evidence of the relationship between fiscal decentralization and tax structure and the technical efficiency of tax collection. Data on technical efficiency estimates was obtained for sampled 28 OECD countries over the period 2004-2017 by means of Data Envelopment Analysis (DEA). This is followed by an exploration of how technical efficiency is affected by fiscal decentralization and tax structure variables. Results from the study revealed that technical efficiency in form of digitalization of tax administration has a positive and significant impact on the efficiency of tax collection.

Oreku (2021) conducted a study on the application of digital technology in enhancing tax revenue collection from micro businesses in Tanzania. The main aim of the study was to explore the potentials of digital technology to enhance tax revenue collection and its administration on Micro Businesses in Tanzania. To achieve the aim of the study, data on tax administration, challenges impeding tax administration to MBs and the potential of digital technology in tax administration were collected by means of administering questionnaires and conducting interviews. To obtain quantitative data for the study, questionnaires were administered to 137 employees and owners of Micro Business from various business sectors in Dar es Salaam the capital of Tanzania. Qualitative data for the study was obtained by conducting semi-structured interviews with 24 officers of the Tanzania Revenue Authority (TRA). Thematic approach was used to analyze collected qualitative data while descriptive statistics was used to analyze quantitative data by means of Statistical Package for Social Scientists (SPSS). Findings from the study revealed that current tax practices to MBs are inconsistent with theories of low administration cost, wide tax base, and simple to administer tax procedure. However, the employed digital technology is found capable of overcoming the challenges and enhancing tax revenue.

Rosario and Chavali (2021) investigated digitalization of taxation in changing business environment, Base Erosion and Profit Shifting (BEPS) in the context of India. Secondary data on tax digitalization efforts, direct taxes and percentage of direct taxes to Gross Domestic Product (GDP) were collected from the Reserve Bank of India (RBI) 1988-2017. Collected qualitative data on government digitalization efforts starting 1982 were described while quantitative data on direct taxes and its contribution to GDP were presented using descriptive statistical tools of charts. Results from the study revealed that successive Indian governments have been making their contributions to the digitalization of taxation since 1982 as various measures were put in place towards progressive strengthening of the digitalization. Results from the quantitative data revealed growing trends in direct tax collections from \$1.26billion in 1988 to \$121.01billion in 2017 while the contribution of the direct taxes to GDP showed fluctuating trends from 0.73% in 1988 to 8.01 in 2007 decreasing to 7.57% in 2017.

Adu, Buabeng, Asamoah and Damoah (2019) evaluated the digitalization of local revenue collection in Accra Metropolitan Assembly (AMA) which is the political and administrative authority for the city of Accra, Ghana. The study evaluated the impact of the use of point of sale

digital devices on collection of rates 2012-2016 with the introduction of the device in 2012. To achieve the aim of the study, primary and secondary data were collected over the period of the study. The primary data was obtained by conducting an in-depth interview with 17 staff of AMA while secondary data was sourced from the annual reports and annual composite budgets of AMA over the period of the study. Analysis of these documents revealed seven sources of revenue which are rates, fees and fines, licenses, land, rent, investment and miscellaneous. Interviewed staff agreed that there was significant increase in rates collection after the introduction of the digital device as it has also enhanced accountability and transparency. Quantitative result confirmed this, as collection of rates overtook fees and fines that used to be the highest contributor of revenue.

Tyokoso, Onho and Musa (2021) examined Tax Identification Number (TIN) and Tax Revenue Performance in Nigeria focusing on the effect of TIN on tax revenues from Valued Added Tax (VAT), Company Income Tax (CIT), Custom and Excise Duties (CED) and Petroleum Profit Tax (PPT) generation. Data for the study was secondary data obtained from the annual statistical bulletin of the Central Bank of Nigeria (CBN) 1998-2017. Collected data was analyzed by means of regression analysis in form of paired sample t-test. Findings from the study revealed significant positive difference in the means of VAT, CIT, CED, and PPT after the introduction of TIN. Thus, there is empirical evidence indicating that TIN as a digital identification in the tax digitalization efforts of Nigerian tax administration has enhanced tax revenue collection.

Hanga, Mohammed, Dandago and Musa (2020) conducted a study with the aim of examining the impact of TIN on Internally Generated Revenue (IGR) collection in Adamawa State, Nigeria. To achieve the aim of the study, secondary data on tax payments by individuals and non-individuals with TIN registration in Adamawa State 2009-2015 was collected from the Adamawa State Board of Internal Revenue Service. Collected data was analysed using descriptive statistics, Pearson correlation, multiple regression analyses and paired sample t-test. Results from these analyses revealed that Pearson correlation showed individuals (IND) with TIN have responded positively to the payment of Pay As You Earn and other taxes than those without TIN. Non-Individuals (NIND) also have more positive and significant response towards remittance of their employees' PAYE and Non-PAYE taxes than businesses without TIN. Multiple regression analysis results indicated significant impact on businesses revenues collection for businesses with TIN. Paired sample t-test result also showed significant difference between the scores of pre-TIN and post-TIN IGR collection in Adamawa State.

Thus far, there are existing literature on the impacts of digitalization on tax revenue collection. Studies by Martíneza, Arzozb, and Arreguic (2022), Oreku (2021), Rosario and Chavali (2021) and Adu, Buabeng, Asamoah and Damoah (2019) are conducted outside Nigeria; thus, there is literature gap of settings. However, the studies by Tyokoso, Onho and Musa (2021) and Hanga, Mohammed, Dandago and Musa (2020) conducted within the context of Nigeria. This notwithstanding, in both the context of studies conducted outside Nigeria and in Nigeria there are literature gaps of location, time period, theoretical framework, type of data, its collection and method of analyses thereby justifying the conduct of this study. This results into obtaining an updated knowledge on the area in the context of Nigeria.

3. Research Methods

The aim of this study is to evaluate the impact of the tax digitalization processes by FIRS by one, describing the digitalization efforts based on obtained qualitative data and two, by undertaking trend analyses of total tax revenue collections 2002-2021 based on availability of data to reveal the impact of the digitalization on collected taxes. Although implementation of TIN in 2011 is regarded as the beginning of digitalization of tax administration, up to towards the end of 2012, it was not significantly implemented (Nigerian Governors Forum, 2012). Consequently, the study considers 2011 as pre-digitalization year; thus, 2002-2010 a period of 10 years is designed as pre-digitalization period while 2012-2021 another 10 years is considered as post-digitalization era. The study is designed as ex-post facto in which qualitative secondary data is collected on the various digitalization efforts of FIRS and quantitative secondary data on tax revenue collection by FIRS over the period of the study. Therefore, the study is conducted based on collected secondary data on these from FIRS, OECD and World Bank documents. Collected qualitative data on various digitalization efforts by FIRS is descriptively presented in section 2 while descriptive statistical tools of charts are used to present quantitative data on tax revenue collections over the period of the study 2002-2021.

3.1 Theoretical Framework

Policy means laws, regulations, procedures and administrative actions of governments and institutions that affect members of the public (Centre for Disease Control and Prevention, 2015). Therefore, it is appropriate to undertake analysis of policies by governments and institutions to help in determining whether implemented policies are good or bad. Public policy analysis is traceable to the United States of America Flood Control Act of 1933 (Dorfman, 1976) in which costs and benefits of public works are assessed (Bromley, 1990). Drawing from this, the study evaluates the impacts of digitalization of tax administration in Nigeria by FIRS. Evaluation entails an examination of a programme by collecting and analyzing information about the programme, its activities, characteristics, and outcomes. This is undertaken to make judgments about the programme, to improve its effectiveness, and/or serve as a basis for making further decisions (Patton, 1987). Evaluation could be undertaken from four perspectives; one: formative evaluation to ensure that a programme or activity is viable, suitable and adequate before it is fully implemented. Two: process evaluation, that assist in determining whether implemented programme or activities are as intended. Three: outcome evaluation that measures the effects of a programme and four; impact evaluation that assess the effectiveness of a programme in achieving its ultimate goals (Centre for Disease Control, 2022). This study evaluates the efforts of digitalization of tax administration by FIRS and their impacts on tax collection 2002-2021; thus, falling into the fourth category of evaluation.

4. Results and Discussion

Results of this study are from qualitative and quantitative data while the qualitative data give an insight into the digitalization efforts of FIRS, the quantitative data is on trends of tax revenue collections 2002-2021. Results from the qualitative data have shown significant commitments by successive governments from 2005 when FIRS became steadfast in implementing digitalization of

its operations. The digitalization process started with what is termed modernization project in which the service started leveraging on information technology to standardized its operations such as automation of tax filling and collection that curtailed corruption, increase monitoring and tracking capabilities FIRS (Bennet, 2012) and this laid the foundation of the digitalization process (Premium Times, 2020). Following this is the launching of UTIN in 2011 which is immediately succeeded by launching of TIN in the same year which eliminated duplication of issuance of numbers to taxpayers under UTIN. Similarly, the introduction of TIN has resulted in significant increase in number of registered taxpayers from 10million in 2015 to about 45million in 2019. Subsequent digitalization efforts by FIRS was the introduction of ITAS in 2013 which significantly improved tax assessments and enabled e-filling of tax returns.

Following ITAS was the launching of SIGTAS in 2014 which significantly improved registration of corporate bodies and e-filling by taxpayers. This is succeeded by TaxProMax which is a home-grown application that is enabling taxpayers to register for taxes online, file returns, remit taxes, carry out assessments and keep track of tax obligations. Likewise, taxpayers can manage withholding tax deductions, capital allowance and loss, download tax clearance certificate, and communicate with the FIRS on tax issues. The quantitative aspects of the study are presented and discussed in Table 1 - 4 and Figure 1.

Table 1. Collected taxes, average annual exchange rate ₦ to US\$ and collected taxes in US\$

Years	Oil taxes	Non-oil Taxes	Total Revenue Tax in Trillions of Naira	Average Annual Exchange Rate of Naira to US dollar	Total Revenue Tax in billions of US \$
2002	204.40	224.40	428.80	₦115 to 1US\$	3.73
2003	438.00	255.40	693.40	₦125 to 1US\$	5.55
2004	878.60	316.20	1,194.80	₦135 to 1US\$	8.85
2005	1,522.00	389.20	1,911.20	₦130 to 1US\$	14.70
2006	1,353.00	513.70	1,866.70	₦128 to 1US\$	14.58
2007	1,132.00	716.30	1,848.30	₦129 to 1US\$	14.33
2008	2,061.00	911.30	2,972.30	₦120 to 1US\$	24.77
2009	939.40	1,147.00	2,086.40	₦152 to 1US\$	13.73
2010	1,481.00	1,359.00	2,840.00	₦146 to 1US\$	19.45
2011	3,070.59	1,557.88	4,628.48	₦147 to 1US\$	31.49
2012	3,201.32	1,806.33	5,007.65	₦155 to 1US\$	32.31
2013	2,666.37	2,139.28	4,805.64	₦152 to 1US\$	31.62
2014	2,453.95	2,260.61	4,714.56	₦152 to 1US\$	31.02
2015	1,157.81	2,149.65	3,307.46	₦195 to 1US\$	16.96
2016	1,157.81	2,149.65	3,307.46	₦195 to 1US\$	16.96
2017	1,520.48	2,507.46	4,027.95	₦305 to 1US\$	13.21
2018	2,467.58	2,853.31	5,320.89	₦307 to 1US\$	17.33
2019	2,114.27	3,147.65	5,261.92	₦305 to 1US\$	17.25

2020	1,516.99	3,435.23	4,952.22	₦305 to 1US\$	16.24
2021	2,008.45	4,395.25	6,402.71	₦410 to 1US\$	15.62

From Table 1, tax revenue collections from oil and non-oil sources was ₦428.80billion or \$3.73billion in 2002 peaking at ₦6.40trillion or \$15.62billion in 2021. However, the highest dollar value of \$32.31billion corresponds to ₦5trillion in 2012 perhaps due to more favorable exchange rate than in 2021. Oil taxes was the dominant source of revenue from 2002 to 2015; however, from 2015, the non-oil taxes became dominant up to 2021. This may be signaling that the country has started achieving economic diversification that may lead to reduced overdependence on oil and gas revenues. Figure I present the trends of collected taxes 2002-2021 in Nigerian Naira (₦).

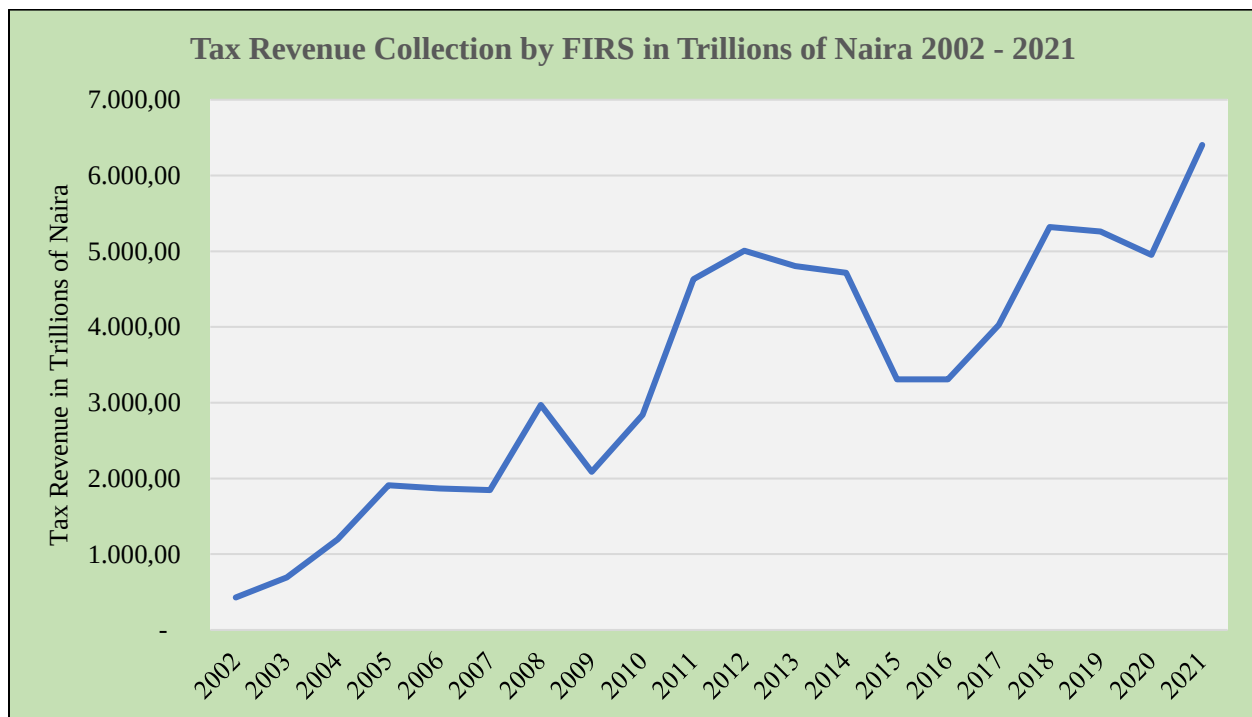


Figure 1. Total tax collections by FIRS 2002-2021 in Trillions of Nigerian Naira (₦)

Results in Table 1 are indicating that on the overall, total tax revenue collections by FIRS 2002-2021 showed fluctuating trends. Total collected taxes were about ₦429billion (\$3.73billion) in 2002 and increased to ₦693billion (\$5.55billion) in 2003 which further increased to ₦1.19trillion (\$8.85billion) in 2004 further increasing to ₦1.91trillion (\$14.70billion) in 2005. However, tax collections reduced to about ₦1.87trillion (\$14.58billion) in 2006, further decreasing to about ₦1.85trillion (\$14.33billion) in 2007 which significantly increased to ₦2.97trillion (\$24.77billion) in 2008 decreasing to about ₦2.09trillion (\$13.73billion) in 2009. This decreasing trend was reversed by increased collections in 2010 to ₦2.84trillion (\$19.45billion) which further increased to about ₦4.63trillion (\$31.49billion) in 2011 further increasing to about ₦5.01trillion

(\$32.31billion) in 2012. The increasing trend was however reversed to decreased collections of about ₦4.81trillion (\$31.62billion) in 2013 decreasing to ₦4.71trillion (\$31.02billion) in 2014 sharply decreasing to about ₦3.31trillion (\$16.62billion) in 2015 and remaining the same ₦3.31trillion (\$16.62billion) in 2016. This decreasing trend was reversed with increased tax collection to about ₦4.03trillion (\$13.21billion) in 2017 which increased to ₦5.32trillion (\$17.33billion) in 2018 which decreased to ₦5.26trillion or (\$17.25billion) in 2019 further decreasing to ₦4.90trillion (\$16.24billion) in 2020 which however increased to ₦6.40trillion (\$15.62billion) in 2021. It could be noted that on the overall, tax revenue collections post digitalization 2011-2021 have not fallen to any level of pre-digitalization collections 2002-2011 thereby signifying enhanced although fluctuating tax collections post digitalization. Pre and post digitalization collected taxes are broken down as presented in Table II.

Table 2 Collected Taxes 2002-2021 broken into pre and post digitalization period

Pre-digitalization period				Post-digitalization period			
S/N	Years	Collected Taxes (₦)	Collected Taxes (\$)	S/N	Years	Collected Taxes (₦)	Collected Taxes (\$)
1	2002	428.80	3.73	1	2012	5,007.65	32.31
2	2003	693.40	5.55	2	2013	4,805.64	31.62
3	2004	1,194.80	8.85	3	2014	4,714.56	31.02
4	2005	1,911.20	14.70	4	2015	3,307.46	16.96
5	2006	1,866.70	14.58	5	2016	3,307.46	16.96
6	2007	1,848.30	14.33	6	2017	4,027.95	13.21
7	2008	2,972.30	24.77	7	2018	5,320.89	17.33
8	2009	2,086.40	13.73	8	2019	5,261.92	17.25
9	2010	2,840.00	19.45	9	2020	4,952.22	16.24
10	2011	4,628.48	31.49	10	2021	6,402.71	15.62
Total		20,470.38	151.17			47,108.47	208.51

From Table 2, total collected tax over the pre-digitalization period 2002-2011 is ₦20.47trillion or \$151.17billion while collected tax post digitalization period 2012-2021 is ₦47.10trillion or \$208.51billion. Therefore, post digitalization collected taxes exceeded pre-digitalization collections by ₦26.64trillion or \$57.33billion thereby signifying the positive impact of digitalization of tax administration in enhancing tax revenue collections. Pre and post digitalization collections are further subjected to paired sample t-test to statistically determine existence of difference in the means of collected taxes over the two periods and the level of statistical significance of the difference. A paired t-test is used to compare two population means in which observations in one sample are paired with observations in another sample such as in case of before and after observations such as in this study (Shier, 2004); its formula is as follows.

$$t = \frac{\sum d}{\sqrt{\frac{n(\sum d^2) - (\sum d)^2}{n-1}}}$$

Where:

On running the t-test in Statistical Package for Social Sciences (SPSS) after conducting normality test, the following paired sample statistical result in Table 3 is obtained.

Table 3: Results of Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Predig	2047.0380	10	1221.02420	386.12176
Postdig	4710.8460	10	948.62036	299.98010

From Table 3, the mean of pre-digitalization tax collections is ₦2,047.04trillion while the mean of post-digitalization tax collections is ₦4,710.85trillion signifying that the mean of post digitalization tax collection exceeds the mean of pre-digitalization tax collections by ₦2,663.81. Table IV is the summarized result of the paired sample t-test revealing the statistical significance of the means of the two periods.

Table 4: Result of Paired Samples Test

	Mean	Significance
Pair 1 Predig-Postdig	-2663.80800	.001

Result from Table 4 indicates that the means of samples of pre and post digitalization tax collections is statistically significant at 0.005 level of significance as obtained p-value is .001. This is further confirming the impacts of digitalization of tax administration on tax revenue collections 2012-2021.

4.1. Discussions

The main goal of tax administration is to ensure compliance by tax payers and this entails making the system simple for taxpayers, minimize compliance costs for taxpayers, minimize costs of collections by the tax authority and ensuring accountability of collected tax revenues among others (Jacobs, 2013). Therefore, modernization of tax administration is meant to achieve these and other goals of tax administration. From the preceding on digitalization efforts of FIRS, it could be argued that the digitalization efforts are succeeding in achieving the goals of tax administration by moving from manual to electronic procedures of tax assessments and collections. The electronic procedures of tax administration have reduced risks of corruption, eased filling of tax returns, enhanced accountability in the tax collection, increased tax payers trust and confidence in the administration and brought in more tax payers into the tax net. Thus, efforts by FIRS to digitize its tax administration has positively impacted on administration of taxes administered by the service in Nigeria. This finding indicating positive impact of the digitalization efforts of tax administration is consistent with (Rosario & Chavali, 2021). Indeed, the score of 0.20 on global innovation 2021 signified improvements in adoption of technology in the country at large though coming slowly (UNCTAD, 2005; UNCTAD, 2021).

Looking at the trends of collected taxes, decreased collections in 2007 could be attributed to general elections that took place in the year as elections in Nigeria are characterized by instability

and violence which could be pre or post elections (Ashindorbe, 2018). There is strong established relationship between political stability and economic growth (Acar, 2019; Alesina & Ozler, 1996); thus, election instability in the election year of 2007 perhaps affected economic performances resulting in to decreased tax revenue. Significant increase in tax revenue collections in 2008 could be linked to international oil price that peaked at \$145.75 per barrel (Hamilton, 2009) making Nigeria to realize significant tax revenue from oil and non-oil taxes. The significant decrease in tax revenue collections in 2009 perhaps, is related to the global financial crisis considered the most serious financial crisis since the great depression of 1929 (Blankenburg & Palma, 2009). This crisis affected virtually all global economic activities including oil prices which was as low as \$36 end of 2008 (Hamilton, 2009) which affected tax revenue collections in 2009. Significant increase in collected revenue 2011-2013 is also attributable to international oil prices as prices increased in these years which although fluctuated but better than what was witnessed end of 2008 to early 2009.

International oil prices decrease in 2014 through 2015 and 2016 (Ellwanger, Sawatzky & Zmitrowicz, 2017); perhaps, accounted for the low tax collections of 2014 compared with 2013 and 2015 compared with 2014 while 2016 collections remained constant with 2015. Decreased collections in 2020 are equally attributable to low collections from oil taxes as it is the lowest compared with 2018 and 2019. On the overall, increased tax collections are consistent with (Martínez, Arzozb & Arreguic, 2022) that found digitalization of tax administration having positive and significant impact on the efficiency of tax collection. It is also consistent with (Rosario & Chavali, 2021) that reported digitalization of tax has increased tax revenue collection and (Tyokoso, Onho & Musa, 2021) and that found issuance of Taxpayer Identification Number (TIN) which is a component of the digitalization has enhanced tax revenue collections. Digitalization of tax administration is said to have five levels of e-filing, e-accounting, e-match, e-auditing and e-assessment. Nigeria's FIRS is placed at the first level of e-filling capabilities in 2017 (EY, 2017); thus, FIRS arguably has established data base of taxpayers and ensured compliance by the level of attained digitalization. This may be an explanation to enhanced tax revenue collections especially from 2011 when TIN was issued to taxpayers followed by further strengthening of the digitalization up to 2021 when TaxPro Max was launched. Thus, it could be contended that increased tax revenue witnessed 2011-2021 was sequel to digitalization of tax administration by FIRS. From preceding discussions, policy analysis analytical framework better explains these findings as digitalization of tax administration is found useful in enhancing tax revenues. Practically, whenever, automated checks are established in a system, compliance and efficiency tends to be high.

6. Conclusion

Based on above findings from the study which aims to evaluate the impact of the tax digitalization processes by FIRS, it could be concluded that FIRS has been proactive in implementing various digitalization efforts to digitizing tax administration in Nigeria. Similarly, it could be concluded that the digitalization efforts are enhancing tax revenue collections even on fluctuating trends. Consequently, the study is recommending that policy makers should pay more attention to the digitalization exercise as it is increasingly becoming the best global practice.

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