Salud, Ciencia y Tecnología - Serie de Conferencias. 2025; 4:1394
doi: 10.56294/sctconf20251394

ORIGINAL

Value Added Tax from Digital Economy and Information Technology Funds on Revenue Generation

Impuesto al Valor Agregado de Fondos de Economía Digital y Tecnologías de la Información sobre la Generación de Ingresos

Marvis Ndu Okolo[1], Michael Tonbraladoh Sinebe[1], Isoso Monday Chukwugek[2], Okwu Peter Ifeanyi[3], Ashibogwu Nze Kingsley[4]

[1]Department of Accounting, Delta State University. Abraka, Nigeria.
[2]Department of Accounting, Dennis Osadebay University. Asaba, Nigeria.
[3]Department of Accountancy, Alex Ekwueme Federal University. Ndufu Alike, Nigeria.
[4]Department of Accounting, Delta State University of Science and Technology. Ozoro, Nigeria.

Cite as: Okolo MN, Sinebe MT, Monday Chukwugeku I, Ifeanyi OP, Nze Kingsley A. Value Added Tax from Digital Economy and Information Technology Funds on Revenue Generation. Salud, Ciencia y Tecnología - Serie de Conferencias. 2025; 4:1394. https://doi.org/10.56294/sctconf20251394

Submitted: 22-06-2024 **Revised:** 10-10-2024 **Accepted:** 11-02-2025 **Published:** 12-02-2025

Editor: Porf. Dr. William Castillo-González

Corresponding Author: Okolo MN

ABSTRACT

Introduction: digital taxation has become a critical area of global focus, with many countries adopting value-added tax on digital services to boost revenue from online sectors. The objectives of the study were to examine the effects of value-added tax from digital economy, and information technology funds on revenue generation in Nigeria, using the unified theory of acceptance and use of technology as a framework on the overall effects of digital taxes on Nigeria's taxation landscape.
Method: the research utilised a survey design involving 500 respondents, including 50 members of the Federal Inland Revenue Service and 450 internet users from a total population of 4,4 million phone users.
Results: findings reveals that electronic transfer funds significantly enhanced revenue generation. Additionally, the digital economy positively affected aggregate revenue streams, while digital taxes also promoted technological utilization in Nigeria.
Conclusions: the study among others concluded that effective implementation of digital taxation, value-added tax, and technology funds has improved revenue generation in Nigeria. The study recommends a streamlined tax structure to ensure consistent revenue growth, highlighting the need for self-compliance, reduced administrative burdens and sustaining the eight proposed pillars will be vital for advancing Nigeria's digital economy.

Keywords: Digital; Taxation; Digital-economy; Information Technology; Revenue Generation.

RESUMEN

Introducción: la tributación digital se ha convertido en un área crítica de atención global, y muchos países han adoptado el impuesto al valor agregado sobre los servicios digitales para impulsar los ingresos de los sectores en línea. Los objetivos del estudio fueron examinar los efectos del impuesto al valor agregado de la economía digital y los fondos de tecnología de la información sobre la generación de ingresos en Nigeria, utilizando la teoría unificada de aceptación y uso de la tecnología como marco sobre los efectos generales de los impuestos digitales en el panorama tributario de Nigeria.
Método: la investigación utilizó un diseño de encuesta que involucró a 500 encuestados, incluidos 50 miembros del Servicio Federal de Impuestos Internos y 450 usuarios de Internet de una población total de 4,4 millones de usuarios de teléfonos.

Resultados: los hallazgos revelan que los fondos de transferencia electrónica mejoraron significativamente la generación de ingresos. Además, la economía digital afectó positivamente los flujos de ingresos agregados, mientras que los impuestos digitales también promovieron la utilización de la tecnología en Nigeria.
Conclusiones: el estudio, entre otras cosas, concluyó que la implementación efectiva de la tributación digital, el impuesto al valor agregado y los fondos de tecnología ha mejorado la generación de ingresos en Nigeria. El estudio recomienda una estructura tributaria racionalizada para garantizar un crecimiento constante de los ingresos, destacando la necesidad de autocumplimiento, cargas administrativas reducidas y el mantenimiento de los ocho pilares propuestos, que serán vitales para el avance de la economía digital de Nigeria.

Palabras clave: Digital; Impuestos; Economía Digital; Tecnología de la Información; Generación de Ingresos.

INTRODUCTION

Today, the issue of digital economy has become a subject of renewed global interest, with several countries embarking on value-added tax through digital services as a means of raising revenues.[1] maintained that taxing the digital economy in Nigeria means increasing tax revenue for the government, broadening the tax base, and reducing the likelihood that the government will take out loans. According to Capello R[2], the European Commission defines the digital economy as the sector encompassing businesses that provide goods and services online and digital platforms that connect excess capacity with demand. In the same view, the Nigeria communication commission,[3] opined that digital economy is any aspect of the economy that is driven by digital technologies and further observed that in the second quarter of 2019, information communication technology (ICT) contributed about 14 % to the gross domestic product (GDP) of the economy, as against Oil and Gas industry that recorded just 9 %. The digital economy provides a variety of activities and transactions that involve the sales, purchases, lease of goods, and services through the internet, thereby removing the necessity of a physical presence of an entity at the place of sale.[4,5] As previously unconnected individuals join the digital world, new value chains are being formed. The theorist of the Fourth Industrial Revolution (4IR) argued that digital economy is a fusion of technologies and blurred the lines between the physical, digital, and biological spheres which has fundamentally changed the aspects of our lives, reimaged and reshaped economic, social and cultural paradigms across the continents.[6,7] The emergence of various new technologies such as artificial intelligence, big data, block chain, cloud computing, mobile applications, and social media has significantly transformed numerous facets of daily life and has led to heightened expectations of revenue generation from the usage.[8,9] Unfortunately, the development and realization of revenues from digital economy still relies greatly on corporate establishments.

More importantly, the failure of the current international tax rules on permanent establishment to produce a fair and inclusive outcome, as well as the significant risk of income shifting and scale negotiation, has led companies to consider the introduction of new policy targets, such as the criteria for taxation and adaption of tax rules to the global digital framework. More so, the combination of tax cuts and increased use of electronic commerce cannot generally be managed in a financially responsible manner due to the revenue losses for tax jurisdictions relative to the forecasted profits that will not be feasible. Contrarily, tax requirements on the revenue of transfer-based earnings are one method of mitigating the influence of rising electronic commerce.[10] Tax authorities are worried over what constitute permanent establishment in this era of digital economy where huge revenues are generated from foreign countries without the need to put up big offices or have many employees there.

Particularly in Nigeria, Section 2 (2A) of the Finance Act of 2019, mandates every operator of an electronic platform seeking to supply goods or services directly provided by the operator, through the electronic platform to a buyer, whether or not such a buyer is the direct recipient of the goods or services; shall for its registration be responsible for charging, collecting, deducting and remitting value-added tax on the goods or services supplied by the operators.[11] Similarly,[12] maintained that in the Kenya Finance Act of 2019, digital marketplace was documented to mean a platform which enables the direct interaction between buyers and sellers of goods and services through electronic channels.

The Value added tax (VAT) policy in Nigeria, charges 7,5 % on the supplies and remitting the same to the Nigerian tax authority particularly to the federal Inland Revenue Service (FIRS). These charges include the numerous companies offering digital services on the internet and have to apply directly to the FIRS for VAT registration in Nigeria.[13,14] These categorise of companies utilize resource-intensive small message service (SMS) servers and interactive voice response (IVR) platforms, smart call solutions with IVR front, payment switches, card transaction switches, unstructured supplementary service data (USSD) platforms.[15] Some are in forms of voicemail platforms, simple mail transfer protocol (SMTP) relay systems, smartphone applications, and

platforms that sell data in real time, websites and learning platforms, video-on-demand services and platforms that have a contract with Nigerian businesses whose customers are in Nigeria.[16]

Taxation keeps evolving in line with developments in the economic environment. Over time, there have been modifications in tax bases, rules of assessments, the scope of taxable events, and tax rates. Generally, the report of the Conference on Trade and Development,[17] argued that the proportion of the digital economy in the global economy had increased from 4,5 % to 15,5 % between 2017 and 2020.

Worrisome is the fact that the Nigerian tax system has not adequately incorporated how digital economies are taxed despite being the second largest economy in Africa. Udo[18] observed that the importance of digital transformation and innovation was felt because of the hard lessons from the 2019 Coronavirus pandemic lockdown, where underdeveloped economies suffered from financial crunches leading to over-seeking of foreign aids and the aftermath has provided nations an opportune moment to rework tax revenue strategies to be more digitally driven. In 2020, the Nigerian Government proposed the 8 pillars of the Digital Nigeria Roadmap of the Federal Ministry of Communications and Digital Economy (FMoCDE) and designated 24th of October every year to be known as Digital Nigeria Day which is in line with the date recognised by the United Nations as the World Development Information Day.[3] A study[19] stressed that it is unfortunate that despite the value creation in the digital economy, Nigeria has not witnessed a reasonable increase in revenue from digital economic activities. The federal Inland Revenue Service has engaged in an evaluation of the Nigerian tax system and stated that the accompanying income tax in the country is assessed on profits from a trade or business earned through virtual or remote work, which is not subject to Nigerian income tax because the principal place of business is not in Nigeria.

It therefore means that companies need to physically engage in Nigeria to open an office, hire a team, and purchase servers or hosting services.[20] Also, companies that provide content on demand require hosting services, contracts, or companies that provide them with the contact demands. Arguably, the geographical mobility and flexibility of the non-collective intangible domain characteristics of digital economy transactions have reduced the impact of interest tax collection contracts, leading to the distortion of income tax ownership principles and guidelines under non-digital economic circumstances.[21,22] A study[23] stressed that one major issue the OECD really need to addressed was how best to tax business in digital economy and whether to tweak the established rules by patch or to formulate a new standard of rules as rebirth.[24] argued that OECD has systematically missed the chances of redefining the paradigm of value creation and what it takes to analyse business model. Providing tax laws and regulations creates the right tax structure for these economic activities. In 2021, the OECD developed what is known as the global tax deal to regulate the taxation of digital economy across the global. A minority of other tax jurisdictions have adopted other value-added tax, in accordance with domestic value-added tax laws, procedures on brick-and-mortar retail and electronic consumer activities that lack physical presence overseas. Particularly at the core of this inability is the need for digital taxes. The scant nature of studies on digital taxes and their implications for emerging economies such as Nigeria is a major issue that needs to be discussed.

Digitalization is a global economic movement that has a significant expectation on economic landscape of the world. This has led to the proliferation of information technology services and e-commerce companies. The increasing roles of the digital economy and the challenges it poses for the existing international tax framework are among the hottest topics in the tax policy debates, both domestically and internationally. Governments in many jurisdictions are concerned that digitalization significantly undermines the efficiency and fairness of existing national tax systems. Given the challenges that the conventional tax systems face in coping with the modern digital economy, some experts in the field of taxation have argued that the traditional tax architecture of providing the current digital economy with a tax framework should be used to guide its development.[3] has identified critical gaps in existing legislation that must be addressed to boost revenue generation. A flexible regulatory framework is essential for fostering a thriving digital economy. The government must partner with relevant organizations to provide competitive training in digital technologies, lowering access barriers to these tools. Additionally, initiatives should aim to increase broadband penetration from 35 % to 75 %. Creating digital transformation technical working groups (DT-TWG) in State institutions will enhance the capabilities and operations of Nigeria's Internet Exchange Point (figure 1).

Innovation and technology play a crucial role in tax administration and collection. For instance,[8] studied the relationship between disruptive technology and the tax filing system in Nigeria. Using a quasi-experimental design, the researchers collected primary data through an online survey of 789 management officials, including 302 from the Federal Inland Revenue Service (FIRS) and 487 from the Ondo State Internal Revenue Service (ODIRS). The Taro Yamane method ensured adequate population representation. Results showed that artificial intelligence, big data analytics, and cloud computing positively impacted the tax filing process, while blockchain technology had a negative effect. The findings indicate that disruptive technology is transforming the tax filing landscape in Nigeria by enhancing automation and increasing tax revenue, highlighting the need for stakeholders to adapt to these advancements.

https://doi.org/10.56294/sctconf20251394

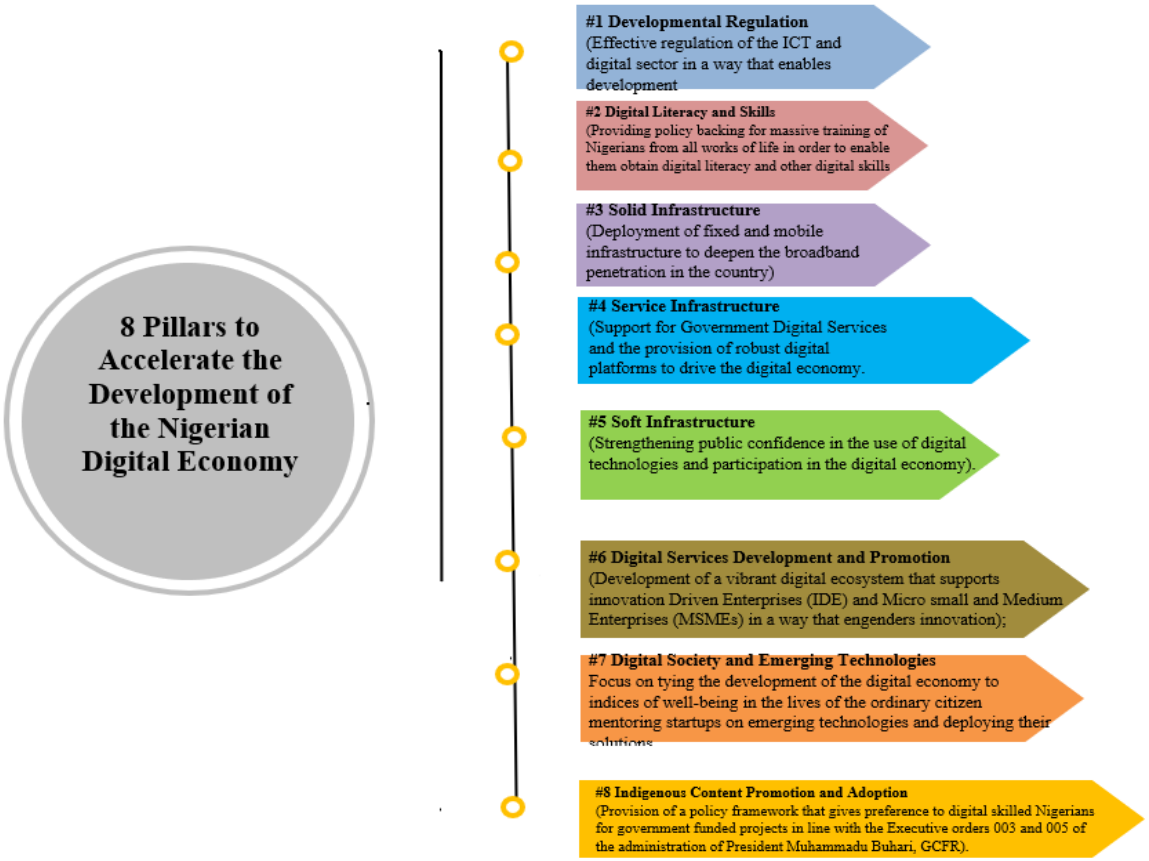

Figure 1. The 8pillars of Digital Taxation. Adopted from the National Tax Policy, 2023

Okunogbe et al.[21] examined how African countries can leverage technology to improve tax collection. It outlines the benefits and challenges related to consumption, property, trade, and income taxes. The research offers a framework for implementing technology to identify tax bases, enhance compliance monitoring, and ensure regulatory adherence. It highlights the importance of senior tax officials integrating their practical experiences with technology in dynamic economic contexts. The thesis asserts that a strategic blend of innovative and traditional practices could significantly strengthen tax systems and improve fiscal infrastructure.

Opiso et al.[25] analysed 52 petroleum-importing entities for the fiscal year 2022, using ordered probit regression, shows a positive correlation between digital tax protocols and excise duty effectiveness. This study aims to explore how digital tax implementation affects this effectiveness. Based on the technology adoption model, factors such as perceived utility, information infrastructure, and digital skills are crucial in shaping excise duty performance. This area represents a significant gap in academic research that requires further exploration.

Li et al.[26] analysed the impact of emerging value chains on national participation in global manufacturing, focusing on high-tech firms in Asia. Their findings highlight that the digital economy in Asian countries is characterized by modernized business methods, driven by technological progress, growth-oriented government policies, and the rise of digital entrepreneurship. The study utilized the "digital economy and society index" and examined various national traits. The authors identified research opportunities related to digital trade, fintech innovations, the platform economy, data analytics, AI, and the sustainability of socio-economic systems. They also acknowledged that the COVID-19 pandemic has introduced new challenges.

Ali[12] examined of Value Added Tax (VAT) on cross-border digital supplies under the Kenya Finance Act signifies a shift in tax responsibility. This study shows a divergence from previous frameworks where VAT assessment and remittance were solely the responsibility of service providers. The digital economy poses challenges for tax authorities globally due to its reliance on intangible assets and difficulties in identifying the jurisdiction of value generation. Research on technology tax is linked to the tax literature from the early stages of the digital economy, highlighting the need to reassess existing tax frameworks to address these new economic realities.

Ajala et al.[27] studied the impact of information technology on tax assessment in Nigeria using a survey design. The sample included 641 management and administrative staff from six multinational companies and revenue services in Lagos State, determined by Krejcie and Morgan's formula. Descriptive and inferential statistics were used for data analysis. Results indicated a significant positive effect of information technology

on effective tax assessment. The study recommended that the government improve tax laws and reduce ambiguities in existing regulations.

Alessandro[28] examined strategies to address international tax issues from the digital economy. The research analysed tax policy, proposing models from the OECD and EU frameworks, and insights from national practices. It developed inquiries on taxation and digitalization, distinguishing between equalization levies and withholding tax methods. The analysis suggests measures to enhance adherence to the international legal framework while minimizing distortions. The findings highlight unilateral experiences, including regional efforts related to the proposal for a common system directive on digital service tax.

Ofurum et al.[29] investigated E-Taxation's impact on Nigeria's revenue, noting a minor decline in tax revenue post-implementation. They recommended enhancing tax knowledge through seminars.[30] analysed taxation's effects on Nigeria's economic growth with the Autoregressive Distributed Lags model, highlighting significant contributions from withholding and value-added taxes in the digital economy. The study suggested reforms focused on digital transformation and noted a lack of positive relationships between ICT and tax generation.

Mpofu[31] criticised international tax laws for inadequately addressing the complexities of the digital economy, pointing out potential revenue gains but warning of negative effects from poorly designed policies. [13] examined legal challenges in digital economy taxation, concluding that existing laws struggle with the reduced relevance of physical presence, destabilizing traditional location-based tax systems.[32] identified digital taxation challenges in Russia, advocating for urgent legislative changes tied to electronic commerce, highlighting that foreign digital firms gain advantages harming domestic revenues.[7] explored social changes from the fourth industrial revolution affecting labour market skills and found significant impact of the new technological adoption.

Udo[18] analysed digital taxation's role in Nigeria's sustainable growth since its 2017 introduction, using secondary data from FIRS, CBN, and the National Bureau of Statistics. Results showed significant impacts of e-tax payments and digital taxes on sustainable growth, recommending collaboration between FIRS and multidisciplinary experts for effective tax reform implementation using innovative technologies. Experts are divided on the economic implications of digital advances; some link advanced digital firms to job creation and growth, while others emphasize the need for tax optimization from internet activities.

Tax specialists argue that the integration of digital technology in advanced economies signals a shift from traditional tax structures. Some contend that the digital economy adheres to existing tax principles, while others suggest it has distinct characteristics.[25] The impact of tax digitalization on economic growth is a critical concern. Some view advancements in the digital economy as a catalyst for economic progress, while others disagree. The rise of advanced digital enterprises has led to job creation and increased global economic growth. Governments worldwide are focusing on tax optimization strategies to capture revenue from the digital economy. Nigeria, among developing nations, is considering taxing the digital economy, despite proposed sector pillars.[33,34] Such measures could affect investment and innovation, impacting economic growth.

A major challenge is regulating digital business profits in lower-tax jurisdictions, emphasizing the complexities and risks of taxing digital sales. The effects of digital taxation on Nigeria's economic development will depend on its implementation. Properly introduced, digital taxation could improve government revenue and benefit overall economic welfare. Effective digital taxation in Nigeria could enhance revenue collection and support economic growth, particularly if it promotes transparency and equity. This approach would create an environment for online enterprises to thrive and contribute to national development. Digital taxation in Nigeria aims to ensure fair taxation of businesses while fostering economic growth. The connection between economic growth and digital technology use is clear. Digital innovations are vital for global economic expansion, with ongoing advancements expected. Examples include the adoption of digital payment systems, remote work, and enhanced consumer convenience. Digitalization also impacts supply chains, especially in e-commerce and internet services, broadening access to digital platforms.

For a long time, developing nations face a digital divide that limits the potential of digital innovations for economic development. Increased consumer demand has led to greater scrutiny of the barriers to digital economy advancement.[26,35] Political and social dynamics are likely to influence global fiscal policy discussions. There is a growing consensus on reallocating multinational corporations' profits to consumer jurisdictions, potentially facilitated by digital taxation. In areas lacking a clear link between physical presence and value creation, insufficient policies regarding tax revenues pose risks for future government needs. In Nigeria, identifying digital transactions for taxation is a significant challenge, leading to reduced revenue and hindered economic growth. A comprehensive digital taxation framework encompassing all online transactions could ensure equitable contributions to the tax system, deter tax evasion, and establish stable government revenue. Moreover, implementing digital taxation may improve compliance and narrow the tax gap, promoting economic progress.

The notion of digitalization of taxation basically encompasses the use of digital solutions to enforce tax law, implement regulations, and collect taxes. This study is based on the unified Theory of acceptance and use of

technology (UTAUT). In 2003,[36] expanded on the UTAUT which incorporated the technology acceptance model (TAM) as developed by Davis in 1989. The advocates of the theory argued that the implementation and uses of digital economy ought to have brought a considerable increase in the tax base of any Nation. Previous literature suggests that the digital economy has now contributed greatly to government revenue mobilization. Because the users of these online platforms are inquisitive to gain insight especially in moving towards user-centric design.[37] A study[3] maintained that digital literacy and skills was initiated as one of the pillars of digital Nigeria and would greatly rely on the Doug Belshaw's famous 8 elements digital literacy model as; cognitive (How to Do), cultural (How to Behave), constructive (How to Use), communicative (How to Communicate), confident (How to Belong), creative (How to Make), critical (How to Evaluate) and civic (How to Participate).

The digital taxation has its own peculiarities, such as being heavily reliant on virtual service delivery channels and can be entirely business-to-business without the need for physical presence in the destination country. So, if the government engaged in training of digital skills, it will boost the revenue generation as projected. The raising of digital taxation as a dedicated concept, separated from the wider examination of the tax treatment of digitalized businesses is the outcome of specific features inherent to digital transactions and activities. The crucial aspect of these features is the difficulty in attributing profits for taxation purposes. UTAUT aims at achieving four cardinal constructs such as performance expectancy, effort expectancy, social influence and facilitating conditions. The constructs occasion users' behavioural intentions (BI) and, consequently, the actual use of technology.[38] UTAUT theorist maintained that voluntariness of application of UTAUT is a product of users' behavioural intentions (BI) and experience emanating in using UTAUT is from the actual uses of the technology and this would overcome the limitation of replicability.[39] However, in practice, countries that are in the digital tax laws are faced with the challenge of the existence of such a non-tax sector in general and digital economic activities, in particular, causing revenue loss, a shift in the tax base among tax types, and even creating strong pressure on the operation of the state budget. As the era changes and the digital economy develops, it also began to attract more attention from both developed and developing countries, and the need to make effective tax guidance towards the digital economy is as important as ever. In light of this, countries have considered introducing specific rules to address such, with the aim of ensuring corporate profits taxation when value is generated in the user country.

Venkatesh et al.[36] argued that UTAUT has gotten about 70 % (percent) behavioural intentions and 50 % (percent) action use. The development of the digital economy has created a strong driving force for economic growth in the world. This theory postulates that the main reason for online tax assessment is because in a situation of zero or very low physical presence in one country, value can be created and delivered without corporate profit identification for income tax purposes. It is because of the great impact of the digital economy has on the economy that previous studies have achieved different results regarding whether or not the digital economy is the driving force of world economic growth. Electronically based discoveries from UTAUT may lead to improvements in e-collection processes such as virtual assistants, use of smartphones, and personalized digital experience. Despite the assistance from these theories, a comprehensive understanding of tax system to technology acceptance is still lacking.

METHOD

The research employed the survey method with a sample population of about 4,4 million Internet users in Delta State of Nigeria in between October and December, 2023 (Q4 report, National Bureau of Statistics, NBS, 2024). The Purposive sampling criteria was used to select 500 respondents which consist of 50 staff of Federal Inland Revenue Service and 450 internet users through a well-structured questionnaire of strongly agree, agree, disagree and strongly disagree. The mean scores were computed as follows (X)= (∑X)/n = (4+3+2+1)/4= 10/4 = 2,50, the mean score of 2,50 and above was regarded as agree while the mean scores below 2,50 was regarded as disagree.

RESULTS

Table 1. Reliability of instrument based on the content

Objectives	No of Items	Alpha Coefficient	Factor Loading
Effect of electronic transfer funds increased revenue generation	4	0,793	0,732
Effect of digital economic on aggregate revenue of Nigeria	4	0,637	0,653
Adoption of digital taxes encourage usage of technology	4	0,628	0,865

Table 2. Questionnaire Administration

Respondents	No. of Distributed Questionnaire	%	No. of Returned Questionnaire	%
Respondents	500	100	400	80
Total	500	100	400	80

Table 2, explained the questionnaire administration process to staff of Delta State Internal Revenue Board and internet users in Delta State. Observably, a total of five hundred (500) copies of questionnaire were distributed to the sampled audience respondents but four hundred 400 copies of the questionnaires were properly filled and returned to the researcher. In effect, 100 copies of the questionnaire were lost in the process retrieving. Hence, 400 (80 %) constituted the sample size used in this study.

Table 3. Demographic Characteristics of the Respondents

Variables	Frequency	Percentage
Age group		
15-20	52	13,0
21-25	65	16,2
26- 30	88	22,0
31 – 35	105	26,3
36 and above	90	22,5
Total	400	100
Sex		
Male	213	53,3
Female	187	46,7
Total	400	100
Marital Status		
Single	174	43,5
Married	224	56,0
Divorced	1	0,3
Separated	-	-
Widowed	-	-
Total	400	100
Religion	399	99,8
Christianity	-	-
Islamic Tradition Religion and Other	1	0,3
Above 15 years	400	100
Total		
Monthly income		
Less than 50 000	10	2,5
50 000 – 100 000	54	13,5
100 001 – 200 000	105	26,3
200 000 - 300 000	194	48,5
Above 300 000	37	9,3
Total	400	100
Educational level		
Primary	5	1,3
Secondary	12	3,0
Tertiary	383	95,8
Total	400	100

Table 3, shows the socio-economic profile of the respondents. In the result, 26,3 % of the respondents were between 31-35years of age, followed by 22,5 % of 36 and above. Also, 22 % of the respondents who were within 26- 30 years and finally the bracket of 15-20 years had 13 %. More so, 53,3 % of the respondents were males as

https://doi.org/10.56294/sctconf20251394

against 46,7 % who were females. The table 3, further revealed that 56 % of the respondents were married, 43,5 % of the respondents who were single as against the 0,3 % of the respondents who were divorced in status. The categorisation of religion shows that 99,8 % were Christian while 0,3 % were tradition religion. The monthly income depicted that 48,5 % earns 200 000 – 300 000, 26,3 % earns 200 000 – 300 000, 13,5 % earns 50 000 to 100 000 and 9,3 % earns above 300 000 Naira per month. Furthermore, 95,8 % of the acquired tertiary institution certificate, 3 % holds secondary certificates and 1,3 % had primary school certificate.

Research Question 1: does introduction of electronic transfer funds increase revenue generation?

Table 4. Mean and standard deviation of the respondents' responses on effect of electronic transfer funds increased revenue generation?

S/n	Item statement	X	Sd	Remark
1	Direct deposit by tax payers has increased revenue generation	3,6	0,50	Agreed
2	Wire transfer by tax payers has increased revenue generation	3,6	0,51	Agreed
3	Electronic bill payment t by tax payers has increased revenue generation	3,7	0,50	Agreed
4	Debit card transaction by tax payers has increased revenue generation.	3,7	0,55	Agreed
	Weighted Average	3,65	0,49	

Table 4, shows whether the introduction of electronic transfer funds increased revenue generation. The mean value of each item was above 2,5 mean cut-off mark earlier set as acceptable benchmark and then the weighted average of 3,65 and standard deviation of 0,49 respectively. This is indicative of the fact that the respondents were homogenous in their opinion.

Research Question 2: to what extent has digital economic contributed to Aggregate revenue of Nigeria?

Table 5. Mean and standard deviation of the respondents' responses on how digital economic contributed to the aggregate revenue of Nigeria

S/N	Item statement	X	SD	Remark
1	Technology usage contributed to aggregate revenue of Nigeria	3,6	0,53	Agreed
2	Research and development contributed to the aggregate revenue of Nigeria	3,5	0,52	Agreed
3	Emerging technologies contributed to the aggregate revenue of Nigeria	3,5	0,55	Agreed
4	Intellectual property rights contributed to the aggregate revenue of Nigeria	3,5	0,56	Agreed
	Weighted average	3,5	0,54	

Table 5, the items listed as to how digital economic contributed to the economic growth of Nigeria. The mean values of each item were above 2,5 mean cut-off mark earlier set as acceptable benchmark and then weighted average of 3,5 and standard deviation of 0,54 respectively. This is indicative of the fact that the respondents were homogenous in their opinion.

Research Question 3: does adoption of digital taxes encourage usage of technology?

Table 6. Mean and standard deviation of the respondents' responses on adoption of digital taxes encourage usage of technology

S/n	Item statement	X	Sd	Remark
1.	Digital taxes enhance quick services delivery to tax payers	3,7	0,53	Agreed
2.	Digital taxes enhance revenue generation for government	3,7	0,51	Agreed
3.	Digital taxes help in fraud reduction in the system	3,7	0,55	Agreed
4.	Digital taxes encourage usages of technology	3,5	0,50	Agreed
	Weighted average	3,65	0,52	

https://doi.org/10.56294/sctconf20251394

Table 6, asserted whether the adoption of digital taxes encourage usage of technology. Again, by expression the mean value of each of the items were above 2,5 mean cut-off mark earlier set as acceptable benchmark and then the weighted average of 3,65 and standard deviation of 0,52 respectively. It shows the homogeneity in the respondents' opinion indicative of the fact that the respondents were homogenous in their opinion.

Table 7. Regression Result

Dependent Variable: RG				
Method: Least Squares				
Date: 12/14/24 Time: 05:34				
Sample: 400				
Included observations: 400				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
EFF	1,176549	0,112456	10,46230	0,000
C	1,545661	0,319350	4,842993	0,001
R-squared	0,753223	Mean dependent var		0,314542
Adjusted R-squared	0,622360	S.D. dependent var		0,101157
S.E. of regression	0,096902	Akaike info criterion		-1,595280
Sum squared resid	0,093900	Schwarz criterion		-1,412692
Log likelihood	15,16696	Hannan-Quinn criter.		-1,612182
F-statistic	7,765444	Durbin-Watson stat		1,901897
Prob(F-statistic)	0,019761			

The result in table 7 shows an adjusted R^2 of 0,753223, which suggests that about 75 % of the total variation in the revenue generation (RG) is explained by the independent variable electronic transfer funds (ETF) as in the model. The observed variation in electronic transfer fund caused 75 % of the total variation in revenue generation (RG). The p-value of the F-statistics is 0,019761 which is less than 0,05, hence, this study concludes that the entire result is statistically significant at 5 % level of confidence. Again, the coefficient of revenue generation (RG) as explained by the electronic transfer funds (ETF) was 1,176549. This implies that electronic transfer funds (ETF) led to increase in revenue generation (RG).

Test of Hypotheses

The decision rule is as follows:

Accept null hypothesis (H_o) if p-value of the t-statistics is greater than 0,05.

Reject null hypothesis (H_o) if p-value of the t-statistics is less than 0,05.

Testing of Hypothesis 1

Table 8. Regression Result

Dependent Variable: EG				
Method: Least Squares				
Date: 12/14/24 Time: 15:34				
Sample (adjusted): 1 400				
Included observations: 400				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
DE	1,047292	0,103988	9,580542	0,0103
C	236,8798	916,3695	0,258498	0,9981
R-squared	0,623282	Mean dependent var		33753,51
Adjusted R-squared	0,602249	S.D. dependent var		39263,76
S.E. of regression	3456,867	Akaike info criterion		19,28080
Sum squared resid	3,11E+08	Schwarz criterion		19,51209
Log likelihood	-293,8524	Hannan-Quinn criter.		19,35620
F-statistic	9,610637	Durbin-Watson stat		1,864197
Prob(F-statistic)	0,026500			

https://doi.org/10.56294/sctconf20251394

Table 8, shows the figure for adjusted R-squared value of 0,602249, which means about 60 % of Economic growth (EG) was noticed digital economy (DE) while the remaining 40 % is for the stochastic variable known as error term. The F-probability of 0,026500 means that the entire result was statistically significant. Digital economy has a coefficient value of 1,047292 which implies that an increases in the operational efficiency of digital economy has led to increases in economic growth in Nigeria.

Testing of Hypothesis 2

H_{01}: Digital economy (DE) has no significant effect on economic growth in Nigeria

The T- probability (0,000) of digital economy (DE) in table 8, is less than 0,05. Hence, the alternative hypothesis (H_1) was accepted and the null hypothesis was rejected. The study asserted that digital economy has positive and significant effect on economic growth in Nigeria.

Table 9. Regression Result

Dependent Variable: UT				
Method: Least Squares				
Date: 12/14/24 Time: 14:16				
Sample: 400				
Included observations: 400				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
DT	1,004303	0,341943	2,937045	0,0166
C	1,177231	2,316048	0,508293	0,6235
R-squared	0,741170	Mean dependent var		0,593782
Adjusted R-squared	0,615023	S.D. dependent var		0,303700
S.E. of regression	0,088531	Akaike info criterion		-1,738477
Sum squared resid	0,070540	Schwarz criterion		-1,510242
Log likelihood	17,16934	Hannan-Quinn criter.		-1,859604
F-statistic	8,991573	Durbin-Watson stat		1,987005
Prob(F-statistic)	0,012215			

The table 9 shows the value for the adjusted R-squared as 0,615023, which means that about 62 % of usage of technology (UI) demonstrated the effect on digital taxes (DI). It therefore means that the remaining 38 % is for the stochastic variable represented as error term. The F-probability of reveals that the entire results were statistically significant with a figure of 0,012215 while the Digital taxes (DI) have a coefficient value of 1,004303, impl6ying that a unit increases in digital taxes (DI) could lead to an increases technological usage in Nigeria.

Testing of Hypothesis 3

H_{01}: Digital taxes have no significant effect on usage of technology in Nigeria.

The t- probability (0,000) of digital taxes in table 9, is actually less than 0,05. Hence, the alternative hypothesis (H_1) was accepted and the null hypothesis was rejected. The study concluded that digital taxes has positive and significant effect on usage of technology in Nigeria.

DISCUSSION

The results highlighted the transformative potential of digital technologies in addressing key challenges in revenue generation and technological adoption. However, these gains depend on sustained investments in digital infrastructure, regulatory frameworks, and public awareness campaigns. Observably, electronic transfer funds (ETF) have significantly and positively influence revenue generation (RG), accounting for over 75 % of the observed variations. This highlights the importance of financial digitization in improving government and business revenues. More so, this result aligns with global evidence that digital payment systems enhance revenue collection by reducing transaction inefficiencies and promoting transparency as collaborated in the works of[28] but disagrees with the study of[30] which argues that there were no positive relationships exist between ICT and tax generations.

Also, the digital economy (DE) has a positively impacts on the aggregate revenue, which explains for over 60 % of the variations. This suggests that digitalization is a critical driver of revenue generation and underscores its growing role in diversifying the economy beyond oil dependence such as the Investments in

fintech, e-commerce, and online education are notable contributors to this trend. The findings refuted the works of[12,31,32] which argued that development of digital economy taxation created lots of problems since it deprives one governments of much-needed tax revenues for the benefits of another government. More so, digital taxes (DI) show a positive effect on the level technological adoption by accounting for 61,5 %, which depicts that encourages technological adoption and usage (UT). This demonstrates how fiscal policies can stimulate technological engagement by fostering a predictable regulatory environment. The result is in agreement with the findings of[4,27] which concluded that information technology had a positive statistically significant effect on effective tax assessment.

RECOMMENDATIONS

Globally, tax payers use internets to access information and communication even in the rural areas. Evidence from the results have shown that the proposed 8 Pillars to accelerate the development of the Nigerian digital economy was implemented religiously and was strictly followed to the latter. Therefore, embracing the digital economy has broaden the user engagement with digital services expanding on daily basis in terms of the number of electronic transactions, volume of digital payments, and user adoption rates. The internet connection in Nigeria has also improved over the years, as most urban areas have better facilities and internet connections than rural area Nigeria. Hence, the government and financial institutions should invest more in infrastructure supporting electronic transfer funds, such as improving broadband infrastructure, fostering innovation, and incentivizing digital entrepreneurship as proposed in the 8 pillars of digital economy; creating enabling environments for the digital economy and eventually huge revenue generation.

Noteworthy, the fact that the digital economy has positive and significant relationship on aggregate revenue. This digital economy is driven by fin-tech, e-commerce, and ICT sectors and other technologies in the State. The State tax structure should be streamlined to encourage self-compliance and reduce administrative burdens because this will bring about transparency and fairness and broader technological adoption among businesses and individuals. There should be concrete efforts to capture and integrates the underbanked and rural populations into the digital economy through digital programs and education such as awareness campaigns, mobile banking services, and subsidized access to technology as documented in pillar 4 of the 8 pillars of digital economy of the country.

Digital taxes have positive and significant effect on technology usage in Nigeria. Internet penetration, mobile phone subscriptions, and app downloads have had monumental growth with approximately 100 million active mobile users leveraging fintech apps figures which underscores the enabling advantages of technology in providing access to digital services. The actual use of technologies (AUT) has increase compliance rates, enhance efficient tax systems and further increase new business registrations. More importantly, the user feedback mechanisms, Net Promoter Scores (NPS), and accessibility indices have continuously and satisfactory meets behavioral intentions. There should be collaborative synergies among public- private partnership and international organization to accelerate the adoption of digital solution to refine strategies of the tax generation issues.

BIBLIOGRAPHIC REFERENCES

1. Oto TE, Wayas S. Taxation of digital economy in Nigeria: Challenges and prospects. AJBFI [Internet] 2024 [Accessed: 12/11/2024]; 8(2):1–14. Available in: https://aspjournals.org/ajbi/index.php/ajbfi/article/view/16

2. Capello R, Lenzi C, Panzera E. The rise of the digital service economy in European regions. Ind Innov [Internet] 2023 [Accessed: 12/11/2024]; 30(6):637–63. Available in: http://dx.doi.org/10.1080/13662716.2022.2082924

3. National Digital Economy Policy and Strategy. National Digital Economy Policy and Strategy. 2020.

4. Nagle F, Seamans R, Tadelis S. Transaction cost economics in the digital economy: A research agenda. Strategic Organization [Internet] 2024 [Accessed: 12/11/2024]. Available in: https://doi.org/10.1177/14761270241228674

5. Ismail Y. Digital economy: State of play and implications for developing countries. Geneva: CUTS. 2020

6. Moll I. The myth of the Fourth Industrial Revolution. Theoria [Internet] 2021[Accessed: 12/11/2024]; 68(167):1–38. Available in: http://dx.doi.org/10.3167/th.2021.6816701

7. Jarosz S, Soltysik M, Zakrzewska M. The fourth industrial revolution in the light of social and competence changes. Eur Res Stud (Internet) 2020 [Accessed: 12/11/2024]; XXIII(Special1):530–48. Available in: http://dx.doi.org/10.35808/ersj/1776

8. Gbemigun CO, Alade ME. Disruptive Technology and Tax Filing Process in Ondo State, Nigeria. Nigeria Lead City Journal of the Social Sciences. [Internet] 2024; 9(2):49–78.

9. Asian Development Bank. A comparative analysis of tax administration in Asia and the pacific: 2020 Edition. Manila, Philippines: Asian Development Bank; 2020.

10. Mocanu B-C, Filip I-D, Ungureanu R-D, Negru C, Dascalu M, Toma SA, et al. ODIN IVR-interactive solution for emergency calls handling. Appl Sci (Basel) [Internet] 2022 [Accessed: 12/11/2024]; 12(21):10844. Available in: http://dx.doi.org/10.3390/app122110844

11. Finance A. Abuja: Publication of the Federal Republic of Nigeria. 2020.

12. Ali A. Value Added Tax on cross-border digital supplies: The Kenyan approach under the Finance Act 2019. Journal of Intellectual Property and Information Technology Law (JIPIT) [Internet] 2021 [Accessed: 12/11/2024]; 1(1):37–62. Available in: http://dx.doi.org/10.52907/jipit.v1i1.62

13. Chukwuma WA, Anushiem UM. Challenges of the finance act on the taxation of digital economy in Nigeria. Awka Capital Bar Journal (ACBJ)[Internet] 2024; 3(1):56–63.

14. Awai ES, Oboh T. Ease of paying taxes: The electronic tax system in Nigeria. Accounting and taxation review [Internet] 2020; 4(1):63–73.

15. Kamal M, Himel AS. Redefining modern marketing: an analysis of AI and NLP's influence on consumer engagement, strategy, and beyond. Eigenpub Review of Science and Technology [Internet] 2023; 7(1):203–23.

16. Da-Silva FJ. Optimization of a B2B Customer experience: Analysis, design and planning of a customer centric approach. 2022.

17. Tax Revenue Statistics (OECD): Digital Taxation Trends in Developing Economies. 2024.

18. Udo JE. Digital taxation and sustainable economic growth in Nigeria. Alvan Journal of Social Sciences. [Internet] 2024; 1(2):1–15.

19. Ahmodu A-L, Ezeani NS. Tax dispute in a Digital Economy: The Legal Implication in Nigeria. NIU Journal of Social Sciences [Internet] 2023 [Accessed: 12/11/2024]; 9(3):39–45. Available in: http://dx.doi.org/10.58709/niujss.v9i3.1709

20. Obimgbo JI, Abanyam FE, Owenvbiugie RO. Exploring electronic commerce technology by business education graduates for employment opportunities and self-reliance in Nigeria. Int J Smart Bus Technol [Internet] 2022 [Accessed: 12/12/2024]; 10(1):111–30. Available in: http://dx.doi.org/10.21742/ijsbt.2022.10.1.08

21. Okunogbe O, Santoro F. The promise and limitations of information technology for tax mobilization. The World Bank Research Observer (Internet) 2022 [Accessed: 12/11/2024]; 38(2): 295-324. Available in: http://dx.doi.org/10.1093/wbro/lkac008

22. Alm J. Tax evasion, technology, and inequality. Econ Gov [Internet] 2021[Accessed: 12/11/2024]; 22(4):321–43. Available in: http://dx.doi.org/10.1007/s10101-021-00247-w

23. Adu S. Taxation in the digital economy-How much will things change. Tax Watch; 2016.

24. Olbert M, Spengel C. International taxation in the digital economy: challenge accepted. World Tax J. [Internet] 2017 [Accessed: 12/11/2024]; 9(1): 3–46. Available in: https://ssrn.com/abstract=4224662

25. Opiso J, Korutaro-Nkundabanyanga S, Tumwine S, Kigongo Kaawaase T, Senyonga L, Echegu S. The digital era of taxation: Analysing the effectiveness of digital tax adoption on petroleum excise duty revenue. Cogent Bus Manag [Internet] 2023; [Accessed: 12/11/2024] 10(3). Available in: http://dx.doi.org/10.1080/23311975.2023.2272370

26. Li K, Kim DJ, Lang KR, Kauffman RJ, Naldi M. How should we understand the digital economy in Asia?

Critical assessment and research agenda. Electron Commer Res Appl [Internet] 2020 [Accessed: 12/11/2024]; 44:101004. Available in: http://dx.doi.org/10.1016/j.elerap.2020.101004

27. Ajala MOO, Adegbie FF. Effects of information technology on effective tax assessment in Nigeria. J Acc Tax [Internet] 2020 [Accessed: 12/11/2024];12(4):126–34. Available in: http://dx.doi.org/10.5897/jat2020.0416

28. Alessandro T. Which Source Taxation for the Digital Economy. Intertax [Internet] 2018 [Accessed: 12/11/2024] ;46(6):495–519. Available in: https://kluwerlawonline.com/journalarticle/Intertax/46.6/TAXI2018053

29. Ofurum NC, Amaefule IL, Okonya EB, Amaefule C. Impact of e-taxation on Nigeria's revenue and economic growth: A pre-post analysis. International Journal of Finance and Accounting [Internet] 2018 [Accessed: 12/11/2024]; 7(2):19–26.

30. Ogbonna UG, Uniamikogbo E, Okojere-Izehi PN. Taxation as a Tool of Enhancing Economic Growth in Nigeria. Central Asian Journal of Innovations on Tourism Management and Finance [Internet] 2022; 3(10):109–25.

31. Mpofu FY. Taxation of the digital economy and direct digital service taxes: Opportunities, challenges, and implications for African countries. Economies [Internet] 2022 [Accessed: 12/11/2024];10(9):219. Available in: http://dx.doi.org/10.3390/economies10090219

32. Nazarov* MA, Mikhaleva OL, Fomin EP. Digital Economy: Russian Taxation Issues. In: The European Proceedings of Social and Behavioural Sciences. Cognitive-Crcs; [Internet] 2019 [Accessed: 12/11/2024]; A1270-1276. Available in: https://doi.org/10.15405/epsbs.2019.03.129

33. Ogidan R. Taxation of the digital economy in Nigeria – analysis of the policy, legal & Administrative dimensions. SSRN Electron J. [Internet] 2021 [Accessed: 12/11/2024]; Available in: http://dx.doi.org/10.2139/ssrn.3977655

34. Rukundo S. Addressing the challenges of taxation of the digital economy: lessons for African countries. Working Paper. 2020;105.

35. Sharma M, Joshi S, Govindan K. Overcoming barriers to implement digital technologies to achieve sustainable production and consumption in the food sector: A circular economy perspective. Sustain Prod Consum [Internet] 2023 [Accessed: 12/11/2024]; 39:203–15. Available in: http://dx.doi.org/10.1016/j.spc.2023.04.002

36. Venkatesh V, Morris MG, Davis GB, Davis FD. User Acceptance of Information Technology: Toward a Unified View Author(s). MIS Quarterly. 2003;27(3):425–78.

37. Davis FD. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q [Internet] 1989 [Accessed: 12/11/2024]; 13(3):319-340. Available in: http://dx.doi.org/10.2307/249008

38. Emudainohwo OB, Ndu OM. Tax Revenue Impact on Economic Growth in Nigeria: ARDL Bounds Test and Cointegration Approach. Journal of Tax Reform. [Internet] 2022 [Accessed: 12/11/2024]; 8(2):140–56. Available in: https://doi.org/10.15826/jtr.2022.8.2.113

39. Zhu L, Bin Othman MS, Mi Yusuf LB, Sun X. User acceptance and sustainable adoption of university management information systems: A cross-cultural study. Salud, Ciencia y Tecnología - Serie de Conferencias [Internet] 2025 Accessed: 12/12/2024]; 4:1239. Available in: http://dx.doi.org/10.56294/sctconf20251239

FINANCING

The authors did not receive financing for the development of this research.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Formal analysis: Michael Tonbraladoh Sinebe.
Original draft and Writing: Okolo Marvis Ndu, Okwu Peter Ifeanyi.
Proofreading and editing: Isoso Monday.